FINAL ENVIRONMENTAL IMPACT STATEMENT

Volume 3: Appendices

For the

Proposed Reconstruction and Expansion of Jamaica Bus Depot

Project Location:

Jamaica, Queens, New York

SEPTEMBER 2019

Prepared for:

MTA New York City Transit

2 Broadway, New York, New York

Prepared by:

STV Incorporated
225 Park Avenue South, New York, New York

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APPENDICES

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Appendix A: Traffic and Transportation

- Automatic Traffic Recorder (ATR) Data
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- 2025 Build Network (Alternative A & B)
- Synchro Analysis (Existing / No Build / Build / Mitigated)

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Automatic Traffic Recorder (ATR) Data

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ATR DATA

LOCATION: EB Liberty Ave
DIRECTION: EB
START DAY: 10/20/2018
START TIME: 12:30 AM

ONE HOUR INTERVAL	MONDAY (10/22/18)	TUESDAY (10/23/18)	WEDNESDAY (10/24/18)	THURSDAY (10/25/18)	FRIDAY (10/26/18)	SATURDAY (10/27/18)	SUNDAY (10/28/18)	AVERAGE TUES-THUR
12:00 AM - 1:00 AM	170	152	158	172	166	237	247	161
1:00 AM - 2:00 AM	124	99	130	95	105	187	179	108
2:00 AM - 3:00 AM	81	77	97	99	106	157	125	91
3:00 AM - 4:00 AM	84	77	85	74	90	129	117	79
4:00 AM - 5:00 AM	120	107	107	113	131	127	113	109
5:00 AM - 6:00 AM	211	201	213	254	226	130	109	223
6:00 AM - 7:00 AM	323	386	357	366	323	180	119	370
7:00 AM - 8:00 AM	622	608	611	587	616	310	229	602
8:00 AM - 9:00 AM	642	658	643	646	666	365	242	649
9:00 AM - 10:00 AM	577	515	503	522	586	421	312	513
10:00 AM - 11:00 AM	499	503	493	535	501	450	359	510
11:00 AM - 12:00 PM	529	499	523	525	559	510	433	516
12:00 PM - 1:00 PM	546	568	528	538	575	539	423	545
1:00 PM - 2:00 PM	576	553	565	556	605	531	483	558
2:00 PM - 3:00 PM	616	641	673	651	742	532	452	655
3:00 PM - 4:00 PM	786	794	798	773	808	477	482	788
4:00 PM - 5:00 PM	864	863	819	812	808	588	515	831
5:00 PM - 6:00 PM	863	938	849	895	928	562	503	894
6:00 PM - 7:00 PM	791	843	824	858	819	520	441	842
7:00 PM - 8:00 PM	652	672	636	692	717	493	432	667
8:00 PM - 9:00 PM	499	552	570	568	569	385	385	563
9:00 PM - 10:00 PM	356	376	396	403	425	360	289	392
10:00 PM - 11:00 PM	242	307	317	309	366	318	260	311
11:00 PM - 12:00 AM	211	203	225	230	300	290	201	219
24 HOUR TOTAL	10,984	11,192	11,120	11,273	11,737	8,798	7,450	11,197

ADT	9,954
AADT	9,664

ATR DATA

LOCATION: WB Liberty Ave
DIRECTION: WB
START DAY: 10/20/2018
START TIME: 12:30 AM

ONE HOUR INTERVAL	MONDAY (10/22/18)	TUESDAY (10/23/18)	WEDNESDAY (10/24/18)	THURSDAY (10/25/18)	FRIDAY (10/26/18)	SATURDAY (10/27/18)	SUNDAY (10/28/18)	AVERAGE TUES-THUR
12:00 AM - 1:00 AM	143	136	136	181	183	281	253	151
1:00 AM - 2:00 AM	95	89	101	97	93	173	144	96
2:00 AM - 3:00 AM	76	79	82	81	70	142	134	81
3:00 AM - 4:00 AM	105	98	113	94	86	133	160	102
4:00 AM - 5:00 AM	195	194	205	178	184	150	157	192
5:00 AM - 6:00 AM	368	378	414	418	390	205	155	403
6:00 AM - 7:00 AM	747	763	729	815	772	269	176	769
7:00 AM - 8:00 AM	980	1,017	1,023	973	979	396	251	1,004
8:00 AM - 9:00 AM	862	912	928	906	910	512	286	915
9:00 AM - 10:00 AM	821	770	794	775	695	542	389	780
10:00 AM - 11:00 AM	632	598	671	677	660	539	470	649
11:00 AM - 12:00 PM	605	648	583	627	627	586	515	619
12:00 PM - 1:00 PM	652	628	661	619	656	612	514	636
1:00 PM - 2:00 PM	691	691	674	661	695	637	553	675
2:00 PM - 3:00 PM	687	691	669	653	698	631	669	671
3:00 PM - 4:00 PM	772	744	775	786	786	631	636	768
4:00 PM - 5:00 PM	788	806	697	780	835	599	636	761
5:00 PM - 6:00 PM	922	901	837	842	925	629	563	860
6:00 PM - 7:00 PM	732	758	837	849	853	554	589	815
7:00 PM - 8:00 PM	598	655	723	674	795	542	468	684
8:00 PM - 9:00 PM	443	490	514	523	552	434	358	509
9:00 PM - 10:00 PM	392	414	414	416	477	397	299	415
10:00 PM - 11:00 PM	280	314	335	328	421	349	260	326
11:00 PM - 12:00 AM	198	206	217	230	352	298	204	218
24 HOUR TOTAL	12,784	12,980	13,132	13,183	13,694	10,241	8,839	13,158

ADT	11,651
AADT	11,312

ATR DATA

LOCATION: NB Merrick Blvd
DIRECTION: NB
START DAY: 10/20/2018
START TIME: 1:00 AM

ONE HOUR INTERVAL	MONDAY (10/22/18)	TUESDAY (10/23/18)	WEDNESDAY (10/24/18)	THURSDAY (10/25/18)	FRIDAY (10/26/18)	SATURDAY (10/27/18)	SUNDAY (10/28/18)	AVERAGE TUES-THUR
12:00 AM - 1:00 AM	106	128	113	130	137	197	246	124
1:00 AM - 2:00 AM	80	83	89	90	95	132	228	87
2:00 AM - 3:00 AM	44	51	58	68	59	84	125	59
3:00 AM - 4:00 AM	52	54	53	46	56	73	142	51
4:00 AM - 5:00 AM	129	127	144	125	128	97	133	132
5:00 AM - 6:00 AM	341	318	298	323	323	139	151	313
6:00 AM - 7:00 AM	901	979	992	998	1,003	255	204	990
7:00 AM - 8:00 AM	1,207	1,162	1,229	1,107	1,154	348	281	1,166
8:00 AM - 9:00 AM	1,067	1,066	1,069	1,028	1,074	452	349	1,054
9:00 AM - 10:00 AM	799	768	819	805	772	515	424	797
10:00 AM - 11:00 AM	669	634	620	618	718	584	511	624
11:00 AM - 12:00 PM	636	607	666	675	648	612	575	649
12:00 PM - 1:00 PM	648	671	702	678	688	608	511	684
1:00 PM - 2:00 PM	743	755	744	725	698	642	593	741
2:00 PM - 3:00 PM	750	777	768	765	779	676	739	770
3:00 PM - 4:00 PM	762	770	699	796	787	627	604	755
4:00 PM - 5:00 PM	711	744	684	703	751	574	606	710
5:00 PM - 6:00 PM	805	782	776	847	806	637	525	802
6:00 PM - 7:00 PM	728	713	707	835	797	613	490	752
7:00 PM - 8:00 PM	607	654	657	646	739	524	396	652
8:00 PM - 9:00 PM	469	504	544	553	583	412	329	534
9:00 PM - 10:00 PM	370	412	440	409	453	363	260	420
10:00 PM - 11:00 PM	266	279	306	315	385	366	232	300
11:00 PM - 12:00 AM	181	179	192	198	276	263	164	190
24 HOUR TOTAL	13,071	13,217	13,369	13,483	13,909	9,793	8,818	13,426

ADT	11,735
AADT	11,393

ATR DATA

LOCATION: SB Merrick Blvd
DIRECTION: SB
START DAY: 10/20/2018
START TIME: 12:45 AM

ONE HOUR INTERVAL	MONDAY (10/22/18)	TUESDAY (10/23/18)	WEDNESDAY (10/24/18)	THURSDAY (10/25/18)	FRIDAY (10/26/18)	SATURDAY (10/27/18)	SUNDAY (10/28/18)	AVERAGE TUES-THUR
12:00 AM - 1:00 AM	180	208	210	212	233	297	292	210
1:00 AM - 2:00 AM	126	123	156	133	155	224	214	137
2:00 AM - 3:00 AM	78	91	96	101	100	150	153	96
3:00 AM - 4:00 AM	75	86	69	66	91	111	123	74
4:00 AM - 5:00 AM	124	108	96	123	125	137	157	109
5:00 AM - 6:00 AM	192	275	234	222	220	143	123	244
6:00 AM - 7:00 AM	371	380	403	385	372	196	170	389
7:00 AM - 8:00 AM	722	710	679	696	698	279	255	695
8:00 AM - 9:00 AM	769	755	807	856	795	385	310	806
9:00 AM - 10:00 AM	639	609	691	662	719	447	408	654
10:00 AM - 11:00 AM	601	558	554	592	612	508	444	568
11:00 AM - 12:00 PM	582	520	605	621	603	512	502	582
12:00 PM - 1:00 PM	646	625	662	648	646	579	558	645
1:00 PM - 2:00 PM	698	680	619	659	737	645	635	653
2:00 PM - 3:00 PM	737	724	756	743	892	679	687	741
3:00 PM - 4:00 PM	1,038	979	966	973	1,023	678	719	973
4:00 PM - 5:00 PM	1,035	1,047	1,010	1,060	1,046	700	663	1,039
5:00 PM - 6:00 PM	1,094	1,130	1,090	1,097	1,095	757	586	1,106
6:00 PM - 7:00 PM	1,083	1,023	1,067	1,056	1,084	652	580	1,049
7:00 PM - 8:00 PM	867	895	965	970	917	597	479	943
8:00 PM - 9:00 PM	691	798	820	825	746	462	449	814
9:00 PM - 10:00 PM	481	591	578	592	569	417	376	587
10:00 PM - 11:00 PM	359	379	366	404	468	326	296	383
11:00 PM - 12:00 AM	274	301	316	309	381	352	245	309
24 HOUR TOTAL	13,462	13,595	13,815	14,005	14,327	10,233	9,424	13,910

ADT	12,190
AADT	11,834

Turning Movement Count (TMC) Summary

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PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Archer Avenue at 165th Street
TIME PERIOD: Tuesday AM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	165th St. (NB)			165th St. (SB)			Archer Ave. (EB)			Archer Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
6:00	Auto		10	6	5	0	2	0	2	42	3	2	41	4	153		
to	Truck		0	0	0	0	1	0	0	0	1	0	1	0			
6:15	Bus		6	0	0	0	0	0	0	14	2	0	11	0			
6:15	Auto		13	14	7	0	3	0	0	33	8	3	47	4	164		
to	Truck		0	1	2	0	0	0	0	0	0	1	0	0			
6:30	Bus		5	1	0	0	0	0	0	9	1	0	12	0			
6:30	Auto		20	27	10	0	9	2	2	49	1	3	72	5	252		
to	Truck		0	2	0	0	0	0	0	2	0	1	1	0			
6:45	Bus		10	1	0	0	0	0	0	18	3	0	14	0			
6:45	Auto		31	47	14	0	10	2	4	42	8	9	83	8	313		
to	Truck		1	1	2	0	0	0	0	1	1	0	1	1			
7:00	Bus		11	1	2	0	0	0	0	15	3	0	14	1		882	
7:00	Auto		31	42	11	2	7	0	1	55	5	14	68	19	319		
to	Truck		0	1	1	0	0	0	0	2	0	0	3	0			
7:15	Bus		14	2	2	0	0	0	0	20	2	0	17	0		1,048	
7:15	Auto	1	29	47	18	3	7	1	2	56	6	10	80	13	326		
to	Truck		1	1	0	0	0	0	0	1	0	2	0	0			
7:30	Bus		13	0	2	0	0	0	0	12	3	0	19	0		1,210	
7:30	Auto		16	64	33	1	16	4	3	78	8	10	52	14	358		
to	Truck		0	0	0	0	0	0	0	1	0	0	1	0			
7:45	Bus		14	1	0	0	0	0	0	23	3	0	16	0		1,316	
7:45	Auto		20	58	35	0	14	2	5	78	1	14	49	10	344		
to	Truck		0	0	2	0	0	0	0	2	0	0	2	0			
8:00	Bus		11	0	0	0	0	0	0	23	3	0	15	0		1,347	
8:00	Auto		14	45	43	4	10	3	7	62	10	13	76	7	348		
to	Truck		0	1	0	0	0	0	0	1	0	1	0	0			
8:15	Bus		12	0	1	0	0	0	0	18	4	1	15	0		1,376	
8:15	Auto		24	40	15	2	15	4	10	68	10	7	81	9	334		
to	Truck		0	0	0	0	0	0	0	2	0	1	1	0			
8:30	Bus		7	0	0	0	0	0	0	24	2	0	12	0		1,384	
8:30	Auto		27	40	17	3	17	3	3	74	8	13	75	9	342		
to	Truck		0	1	0	0	1	0	0	3	0	0	3	0			
8:45	Bus		8	0	1	0	0	0	0	17	5	0	14	0		1,368	
8:45	Auto		26	28	22	3	18	6	6	67	8	15	72	11	340		
to	Truck		1	0	0	1	0	0	0	1	0	1	1	0			
9:00	Bus		10	0	0	0	0	0	0	25	1	0	17	0		1,364	1,384
Peak Hour Volume (PHV)			130	217	134	8	47	10	17	355	38	51	325	44	1,376		
PHV (by approach)				481			65			410			420				
Peak Hour Factor (PHF)				0.94			0.77			0.88			0.85				
Min. Peak Hour Factor (PHF)				0.84			0.81			0.83			0.83				
Max Peak Hour Factor (PHF)				0.94			0.81			0.88			0.85				
Total Autos				422			65			316			348				
Total Trucks				5			0			5			6				
Total Buses				54			0			89			66				
% Auto				87.7%			100.0%			77.1%			82.9%				
% Heavy Vehicles (Trucks & Buses)				12.3%			0.0%			22.9%			17.1%				

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Archer Avenue at 165th Street
TIME PERIOD: Tuesday PM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	165th St. (NB)			165th St. (SB)			Archer Ave. (EB)			Archer Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
16:00	Auto		10	20	28	1	26	5	4	102	10	15	57	10	334		
to	Truck		1	0	1	0	0	0	1	1	0	0	1	0			
16:15	Bus		5	1	0	0	0	0	0	17	3	0	15	0			
16:15	Auto		7	15	30	5	19	7	6	105	15	15	56	4	328		
to	Truck		0	0	0	0	1	1	0	2	0	0	1	0			
16:30	Bus		2	0	0	0	0	0	0	20	3	0	14	0			
16:30	Auto		12	16	28	5	19	4	14	115	15	18	59	13	366		
to	Truck		0	0	0	0	0	0	1	2	1	0	1	0			
16:45	Bus		4	1	0	0	0	0	0	22	2	1	13	0			
16:45	Auto		10	12	31	3	20	6	6	114	19	12	61	7	346		
to	Truck		0	1	1	0	0	0	1	0	0	1	2	0			
17:00	Bus		5	0	0	0	0	0	0	18	2	0	14	0		1,374	
17:00	Auto		13	21	23	4	29	2	5	106	12	25	51	5	338		
to	Truck		0	0	0	0	0	0	0	0	0	1	3	0			
17:15	Bus		3	0	0	0	0	0	0	22	4	0	9	0		1,378	
17:15	Auto	1	10	26	27	2	29	7	7	108	20	30	49	7	365		
to	Truck		0	1	0	0	0	0	0	2	0	0	0	0			
17:30	Bus		3	0	0	0	0	0	0	17	4	0	16	0		1,415	
17:30	Auto		9	12	27	5	23	8	12	110	17	15	55	11	345		
to	Truck		0	0	0	0	0	0	0	2	1	0	2	0			
17:45	Bus		4	0	0	0	0	0	0	17	2	0	13	0		1,394	
17:45	Auto		11	31	32	4	21	4	13	103	14	13	68	10	371		
to	Truck		1	0	1	0	1	0	0	0	0	1	0	2			
18:00	Bus		5	0	0	0	0	0	0	19	4	0	13	0		1,419	
18:00	Auto		11	21	31	6	21	9	11	111	20	17	50	5	355		
to	Truck		0	0	2	0	0	0	0	0	1	0	0	0			
18:15	Bus		3	0	0	0	0	0	0	21	4	0	11	0		1,436	
18:15	Auto		8	19	31	8	17	4	8	116	16	9	58	7	344		
to	Truck		1	0	1	0	0	0	0	2	0	0	0	0			
18:30	Bus		3	1	0	0	0	0	0	17	2	0	16	0		1,415	
18:30	Auto		12	20	19	5	24	3	3	78	10	15	57	15	297		
to	Truck		0	0	0	0	0	0	0	1	0	1	0	0			
18:45	Bus		2	0	0	0	0	0	0	23	3	0	6	0		1,367	
18:45	Auto		12	15	17	0	10	9	9	67	8	20	64	6	271		
to	Truck		0	0	0	0	0	0	0	0	0	0	1	0			
19:00	Bus		8	0	0	0	0	0	0	10	4	0	11	0		1,267	1,436
Peak Hour Volume (PHV)			57	91	120	17	95	28	43	510	87	76	277	35	1,436		
PHV (by approach)			268			140			640			388					
Peak Hour Factor (PHF)			0.83			0.92			0.95			0.91					
Min. Peak Hour Factor (PHF)			0.82			0.81			0.85			0.83					
Max Peak Hour Factor (PHF)			0.83			0.92			0.95			0.91					
Total Autos			248			139			546			330					
Total Trucks			5			1			6			5					
Total Buses			15			0			88			53					
% Auto			92.5%			99.3%			85.3%			85.1%					
% Heavy Vehicles (Trucks & Buses)			7.5%			0.7%			14.7%			14.9%					

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Archer Avenue at Merrick Blvd
TIME PERIOD: Tuesday AM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	Merrick Blvd. (NB)			Merrick Blvd. (SB)			Archer Ave. (EB)			Archer Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
6:00	Auto		0	0	0	0	27	2	0	28	16	6	44	0	162		
to	Truck		0	0	0	0	2	0	0	0	0	0	1	0			
6:15	Bus		0	0	0	4	5	3	0	6	9	1	8	0			
6:15	Auto		0	0	0	1	30	3	0	23	16	5	52	0	164		
to	Truck		0	0	0	0	1	0	0	1	1	0	1	0			
6:30	Bus		0	0	0	4	3	6	0	5	4	0	8	0			
6:30	Auto		0	0	0	1	34	2	0	31	28	21	75	0	238		
to	Truck		0	0	0	2	1	0	0	1	0	0	2	0			
6:45	Bus		0	0	0	5	4	4	0	11	7	0	9	0			
6:45	Auto		0	0	0	2	43	1	0	29	28	20	102	0	269		
to	Truck		0	0	0	0	2	0	0	3	0	0	2	0			
7:00	Bus		0	0	0	4	0	4	0	11	7	1	10	0		833	
7:00	Auto		0	0	0	0	57	0	0	39	26	17	100	0	309		
to	Truck		0	0	0	0	1	1	0	3	1	1	2	0			
7:15	Bus		0	0	0	5	10	9	0	13	11	1	12	0		980	
7:15	Auto	1	0	0	0	2	65	6	0	44	31	19	98	0	322		
to	Truck		0	0	0	0	6	0	0	1	0	2	2	0			
7:30	Bus		0	0	0	2	12	7	0	9	5	0	11	0		1,138	
7:30	Auto		0	0	0	1	97	5	0	67	42	22	72	0	360		
to	Truck		0	0	0	0	4	1	0	1	0	0	0	0			
7:45	Bus		0	0	0	3	8	4	0	13	10	0	10	0		1,260	
7:45	Auto		0	0	0	3	110	5	0	71	40	24	70	0	385		
to	Truck		0	0	0	1	2	0	0	3	1	4	2	0			
8:00	Bus		0	0	0	2	8	4	0	11	13	0	11	0		1,376	
8:00	Auto		0	0	0	1	84	4	0	76	30	25	89	0	364		
to	Truck		0	0	0	0	5	0	0	2	0	1	2	0			
8:15	Bus		0	0	0	3	7	5	0	10	7	0	13	0		1,431	
8:15	Auto		0	0	0	6	97	19	0	57	32	29	80	0	376		
to	Truck		0	0	0	0	6	1	0	1	1	1	1	0			
8:30	Bus		0	0	0	3	6	4	0	14	10	0	8	0		1,485	
8:30	Auto		0	0	0	4	85	10	0	59	36	33	86	0	375		
to	Truck		0	0	0	0	5	0	0	2	1	1	3	0			
8:45	Bus		0	0	0	1	15	3	0	11	8	0	12	0		1,500	
8:45	Auto		0	0	0	3	80	15	0	65	27	40	83	0	373		
to	Truck		0	0	0	0	3	2	0	1	1	0	0	0			
9:00	Bus		0	0	0	3	11	4	0	16	9	0	10	0		1,488	1,500
Peak Hour Volume (PHV)			0	0	0	18	408	41	0	308	179	97	380	0	1,431		
PHV (by approach)			0			467			487			477					
Peak Hour Factor (PHF)			#DIV/0!			0.86			0.88			0.90					
Min. Peak Hour Factor (PHF)			0.80			0.84			0.84			0.84					
Max Peak Hour Factor (PHF)			#DIV/0!			0.86			0.88			0.90					
Total Autos			0			383			401			419					
Total Trucks			0			19			8			13					
Total Buses			0			65			78			45					
% Auto			#DIV/0!			82.0%			82.3%			87.8%					
% Heavy Vehicles (Trucks & Buses)			#DIV/0!			18.0%			17.7%			12.2%					

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Archer Avenue at Merrick Blvd
TIME PERIOD: Tuesday PM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	Merrick Blvd. (NB)			Merrick Blvd. (SB)			Archer Ave. (EB)			Archer Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
16:00	Auto		0	0	0	6	111	10	0	86	38	39	69	0	408		
to	Truck		0	0	0	0	3	0	0	2	0	1	1	0			
16:15	Bus		0	0	0	3	10	3	0	9	6	0	11	0			
16:15	Auto		0	0	0	1	103	9	0	96	42	46	68	0	420		
to	Truck		0	0	0	1	1	0	0	1	0	1	2	0			
16:30	Bus		0	0	0	6	7	4	0	10	12	0	10	0			
16:30	Auto		0	0	0	6	122	13	0	94	42	47	78	0	454		
to	Truck		0	0	0	0	5	0	0	4	1	0	1	0			
16:45	Bus		0	0	0	2	4	4	0	10	10	0	11	0			
16:45	Auto		0	0	0	6	126	6	0	97	54	35	75	0	449		
to	Truck		0	0	0	0	2	1	0	1	0	2	2	0			
17:00	Bus		0	0	0	3	5	4	0	13	8	0	9	0		1,731	
17:00	Auto		0	0	0	5	121	14	0	91	45	41	71	0	430		
to	Truck		0	0	0	1	1	0	0	0	0	1	4	0			
17:15	Bus		0	0	0	1	6	4	0	10	9	0	5	0		1,753	
17:15	Auto	1	0	0	0	11	145	4	0	98	39	36	78	0	460		
to	Truck		0	0	0	0	1	0	0	1	1	1	0	0			
17:30	Bus		0	0	0	3	5	4	0	8	12	1	12	0		1,793	
17:30	Auto		0	0	0	12	115	15	0	108	34	34	71	0	433		
to	Truck		0	0	0	0	3	0	0	1	1	0	2	0			
17:45	Bus		0	0	0	2	5	5	0	8	8	0	9	0		1,772	
17:45	Auto		0	0	0	5	146	11	0	93	40	35	85	0	462		
to	Truck		0	0	0	0	7	1	0	1	0	2	2	0			
18:00	Bus		0	0	0	2	1	3	0	8	11	0	9	0		1,785	
18:00	Auto		0	0	0	8	124	4	0	111	35	34	69	0	432		
to	Truck		0	0	0	0	4	0	0	1	1	0	1	0			
18:15	Bus		0	0	0	4	2	4	0	11	11	0	8	0		1,787	
18:15	Auto		0	0	0	7	108	11	0	115	42	43	65	0	431		
to	Truck		0	0	0	0	0	0	0	3	1	0	0	0			
18:30	Bus		0	0	0	4	2	4	0	6	10	0	10	0		1,758	
18:30	Auto		0	0	0	7	114	5	0	64	34	26	84	0	371		
to	Truck		0	0	0	0	3	0	0	1	1	0	1	0			
18:45	Bus		0	0	0	1	3	3	0	10	10	0	4	0		1,696	
18:45	Auto		0	0	0	9	100	9	0	60	28	38	78	0	355		
to	Truck		0	0	0	0	2	1	0	0	0	1	0	0			
19:00	Bus		0	0	0	5	3	2	0	5	5	1	8	0		1,589	1,793
Peak Hour Volume (PHV)			0	0	0	47	558	51	0	449	193	143	346	0	1,787		
PHV (by approach)			0			656			642			489					
Peak Hour Factor (PHF)			#DIV/0!			0.93			0.94			0.92					
Min. Peak Hour Factor (PHF)			0.80			0.85			0.85			0.84					
Max Peak Hour Factor (PHF)			#DIV/0!			0.93			0.94			0.92					
Total Autos			0			600			558			442					
Total Trucks			0			16			7			8					
Total Buses			0			40			77			39					
% Auto			#DIV/0!			91.5%			86.9%			90.4%					
% Heavy Vehicles (Trucks & Buses)			#DIV/0!			8.5%			13.1%			9.6%					

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Archer Avenue at 168th Street
TIME PERIOD: Tuesday AM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	168th St. (NB)			168th St. (SB)			Archer Ave. (EB)			Archer Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
6:00	Auto		31	70	14	2	0	10	6	27	0	0	9	2	197		
to	Truck		1	4	0	0	0	0	0	0	0	0	0	1			
6:15	Bus		7	3	0	0	0	0	9	0	0	0	1	0			
6:15	Auto		35	83	11	1	0	10	5	20	0	0	9	4	213		
to	Truck		1	6	0	0	0	1	1	0	0	0	0	0			
6:30	Bus		8	8	0	0	0	0	9	0	0	0	0	1			
6:30	Auto		58	117	16	3	0	11	3	28	0	0	27	2	303		
to	Truck		1	5	0	0	0	0	2	1	0	0	1	0			
6:45	Bus		10	3	0	0	0	0	15	0	0	0	0	0			
6:45	Auto		64	117	17	2	0	17	2	32	0	0	44	2	338		
to	Truck		0	8	0	0	0	1	2	0	0	0	0	0			
7:00	Bus		10	3	0	0	0	1	12	4	0	0	0	0		1,051	
7:00	Auto		53	112	30	4	0	21	3	26	0	0	45	9	355		
to	Truck		1	7	0	0	0	2	3	0	0	0	1	0			
7:15	Bus		11	7	0	0	0	1	18	1	0	0	0	0		1,209	
7:15	Auto	1	53	118	31	4	0	22	9	36	0	0	35	4	349		
to	Truck		1	6	0	0	0	1	0	1	0	0	2	2			
7:30	Bus		11	1	2	0	0	0	9	1	0	0	0	0		1,345	
7:30	Auto		44	130	39	7	0	22	5	65	0	0	28	3	373		
to	Truck		0	3	0	0	0	0	0	1	0	0	0	0			
7:45	Bus		9	1	1	0	0	0	15	0	0	0	0	0		1,415	
7:45	Auto		32	119	43	9	0	21	19	54	0	0	43	5	382		
to	Truck		2	5	2	0	0	2	1	2	0	0	1	0			
8:00	Bus		9	0	0	0	0	0	13	0	0	0	0	0		1,459	
8:00	Auto		39	139	39	10	0	32	20	53	0	0	45	3	417		
to	Truck		2	4	0	0	0	1	0	2	0	0	0	0			
8:15	Bus		12	0	1	0	0	2	12	1	0	0	0	0		1,521	
8:15	Auto		45	124	27	5	0	28	10	49	0	0	48	5	376		
to	Truck		0	6	1	0	0	1	0	0	0	0	1	0			
8:30	Bus		7	1	0	0	0	0	17	0	0	0	0	1		1,548	
8:30	Auto		36	117	30	11	0	29	7	45	0	0	58	8	376		
to	Truck		1	8	0	0	0	2	0	0	0	0	0	0			
8:45	Bus		12	0	0	0	0	0	11	1	0	0	0	0		1,551	
8:45	Auto		33	104	23	12	0	47	23	50	0	0	39	6	373		
to	Truck		0	4	0	0	0	0	0	1	0	0	0	0			
9:00	Bus		10	1	0	0	0	0	20	0	0	0	0	0		1,542	1,551
Peak Hour Volume (PHV)			214	526	158	30	0	103	103	216	0	0	154	17	1,521		
PHV (by approach)				898			133			319			171				
Peak Hour Factor (PHF)				0.95			0.74			0.90			0.87				
Min. Peak Hour Factor (PHF)				0.87			0.81			0.82			0.81				
Max Peak Hour Factor (PHF)				0.95			0.81			0.90			0.87				
Total Autos				826			127			261			166				
Total Trucks				25			4			7			5				
Total Buses				47			2			51			0				
% Auto				92.0%			95.5%			81.8%			97.1%				
% Heavy Vehicles (Trucks & Buses)				8.0%			4.5%			18.2%			2.9%				

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Archer Avenue at 168th Street
TIME PERIOD: Tuesday PM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	168th St. (NB)			168th St. (SB)			Archer Ave. (EB)			Archer Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
16:00	Auto		26	66	21	5	0	45	26	79	0	0	36	5	349		
to	Truck		0	2	0	0	0	1	0	1	0	0	0	0			
16:15	Bus		12	9	0	0	0	0	13	2	0	0	0	0			
16:15	Auto		30	86	23	11	0	48	24	73	0	0	49	5	386		
to	Truck		0	0	0	0	0	3	0	3	0	0	0	0			
16:30	Bus		9	5	0	0	0	1	13	3	0	0	0	0			
16:30	Auto		35	87	23	12	0	41	24	81	0	0	50	5	392		
to	Truck		0	1	0	0	0	0	0	3	0	0	1	0			
16:45	Bus		9	7	0	0	0	1	11	0	0	0	1	0			
16:45	Auto		25	71	18	11	0	37	28	77	0	0	42	5	350		
to	Truck		2	0	0	0	0	2	0	0	0	0	0	0			
17:00	Bus		8	7	0	0	0	0	16	1	0	0	0	0		1,477	
17:00	Auto		22	56	28	11	0	37	23	78	0	0	60	4	351		
to	Truck		1	0	1	0	0	3	0	2	0	0	1	0			
17:15	Bus		5	6	0	0	0	0	13	0	0	0	0	0		1,479	
17:15	Auto	1	21	82	14	11	0	44	20	92	0	0	52	2	373		
to	Truck		0	2	0	0	0	1	0	1	0	0	0	1			
17:30	Bus		13	7	0	0	0	1	9	0	0	0	0	0		1,466	
17:30	Auto		32	78	28	11	0	39	26	91	0	0	25	8	366		
to	Truck		0	2	1	0	0	0	0	1	0	0	2	0			
17:45	Bus		7	2	0	0	0	1	12	0	0	0	0	0		1,440	
17:45	Auto		34	76	21	6	0	41	27	79	0	0	49	3	367		
to	Truck		3	1	0	0	0	1	0	1	0	0	0	0			
18:00	Bus		10	6	0	0	0	0	9	0	0	0	0	0		1,457	
18:00	Auto		33	86	24	6	0	41	36	77	0	0	32	4	368		
to	Truck		0	1	0	0	0	0	0	1	0	0	0	0			
18:15	Bus		9	5	0	0	0	0	13	0	0	0	0	0		1,474	
18:15	Auto		28	81	15	11	0	41	28	94	0	0	32	4	368		
to	Truck		0	2	0	0	0	0	1	3	0	0	0	0			
18:30	Bus		13	4	0	0	0	0	11	0	0	0	0	0		1,469	
18:30	Auto		30	77	13	12	0	36	20	53	0	0	47	9	319		
to	Truck		0	2	0	0	0	1	0	1	0	0	0	0			
18:45	Bus		4	4	0	0	0	0	10	0	0	0	0	0		1,422	
18:45	Auto		29	65	11	5	0	36	20	50	0	0	47	8	299		
to	Truck		1	3	0	0	0	0	0	0	0	0	0	0			
19:00	Bus		7	4	0	0	0	1	12	0	0	0	0	0		1,354	1,479
Peak Hour Volume (PHV)			162	348	88	34	0	169	152	343	0	0	160	18	1,474		
PHV (by approach)				598			203			495			178				
Peak Hour Factor (PHF)				0.95			0.89			0.95			0.81				
Min. Peak Hour Factor (PHF)				0.84			0.82			0.84			0.82				
Max Peak Hour Factor (PHF)				0.95			0.89			0.95			0.82				
Total Autos				529			199			448			175				
Total Trucks				10			2			4			3				
Total Buses				59			2			43			0				
% Auto				88.5%			98.0%			90.5%			98.3%				
% Heavy Vehicles (Trucks & Buses)				11.5%			2.0%			9.5%			1.7%				

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Liberty Avenue at 165th Street
TIME PERIOD: Tuesday AM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	165th St. (NB)			165th St. (SB)			Liberty Ave. (EB)			Liberty Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
6:00	Auto		10	10	16	4	2	2	2	43	0	5	87	9	229		
to	Truck		0	0	1	1	0	2	2	9	0	0	5	0			
6:15	Bus		0	0	0	1	0	0	0	1	0	0	11	6			
6:15	Auto		12	19	20	12	4	0	0	46	1	1	152	16	328		
to	Truck		0	1	0	1	0	0	0	9	0	0	13	0			
6:30	Bus		0	0	1	1	0	0	0	6	0	0	6	7			
6:30	Auto		22	32	20	6	4	3	6	72	1	4	170	21	416		
to	Truck		0	1	1	0	0	0	5	6	0	0	11	0			
6:45	Bus		0	1	0	3	0	0	0	7	0	0	9	11			
6:45	Auto		36	56	20	11	11	6	7	98	2	6	180	28	520		
to	Truck		0	1	1	0	0	0	1	10	0	0	17	1			
7:00	Bus		0	0	0	3	0	0	0	7	0	0	3	15		1,493	
7:00	Auto		28	50	24	6	6	13	4	112	0	8	192	38	541		
to	Truck		0	0	1	0	1	0	0	11	0	1	14	0			
7:15	Bus		0	1	0	3	0	0	0	6	0	0	8	14		1,805	
7:15	Auto	1	41	78	46	7	12	11	4	99	0	5	174	26	558		
to	Truck		1	0	2	3	1	0	1	7	0	2	14	1			
7:30	Bus		0	1	1	3	0	0	0	2	0	0	3	13		2,035	
7:30	Auto		31	68	49	10	15	7	11	135	1	10	163	22	566		
to	Truck		0	0	1	0	1	1	1	7	0	0	8	5			
7:45	Bus		0	1	0	3	0	0	0	4	0	0	4	8		2,185	
7:45	Auto		25	71	42	6	14	11	16	147	1	5	190	18	605		
to	Truck		0	2	1	0	0	0	2	13	0	0	17	1			
8:00	Bus		0	0	1	2	0	0	0	7	0	0	2	11		2,270	
8:00	Auto		21	60	42	14	11	7	17	137	0	16	167	25	580		
to	Truck		0	1	1	1	1	0	3	10	0	1	13	0			
8:15	Bus		0	0	0	3	0	1	1	9	0	0	6	12		2,309	
8:15	Auto		19	50	38	13	12	9	12	106	1	10	158	18	493		
to	Truck		0	2	1	1	0	0	2	6	0	0	13	2			
8:30	Bus		0	0	0	2	0	0	0	5	0	0	9	4		2,244	
8:30	Auto		9	53	38	12	16	10	11	127	2	10	173	21	547		
to	Truck		1	0	0	1	2	2	0	12	0	0	15	2			
8:45	Bus		0	1	0	5	0	0	0	6	0	0	11	7		2,225	
8:45	Auto		8	43	25	16	13	12	16	133	4	5	202	16	544		
to	Truck		0	0	1	1	0	2	1	10	0	1	14	1			
9:00	Bus		0	0	1	1	0	0	0	3	0	0	6	9		2,164	2,309
Peak Hour Volume (PHV)			119	282	186	52	55	38	56	577	2	39	761	142	2,309		
PHV (by approach)				587			145			635			942				
Peak Hour Factor (PHF)				0.86			0.95			0.85			0.97				
Min. Peak Hour Factor (PHF)				0.84			0.81			0.85			0.87				
Max Peak Hour Factor (PHF)				0.86			0.95			0.85			0.97				
Total Autos				574			125			568			821				
Total Trucks				9			8			44			62				
Total Buses				4			12			23			59				
% Auto				97.8%			86.2%			89.4%			87.2%				
% Heavy Vehicles (Trucks & Buses)				2.2%			13.8%			10.6%			12.8%				

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Liberty Avenue at 165th Street
TIME PERIOD: Tuesday PM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	165th St. (NB)			165th St. (SB)			Liberty Ave. (EB)			Liberty Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
16:00	Auto		8	28	46	19	18	12	17	169	3	15	156	11	547		
to	Truck		0	2	0	0	0	0	0	10	0	1	8	0			
16:15	Bus		0	1	0	3	0	0	0	10	0	0	6	4			
16:15	Auto		10	32	35	18	21	12	8	143	0	14	172	10	511		
to	Truck		0	0	1	0	0	1	0	5	0	0	7	1			
16:30	Bus		1	0	0	3	0	0	0	10	0	0	5	2			
16:30	Auto		7	28	51	16	20	11	11	183	1	19	153	16	562		
to	Truck		0	1	0	1	0	0	0	11	0	0	9	1			
16:45	Bus		0	0	0	3	1	0	0	6	0	0	9	4			
16:45	Auto		6	29	31	18	25	12	8	192	2	18	178	19	584		
to	Truck		0	0	0	0	0	1	0	7	0	2	12	1			
17:00	Bus		0	0	0	2	0	0	0	10	0	0	6	5		2,204	
17:00	Auto		7	28	25	17	31	20	9	203	1	14	166	17	568		
to	Truck		0	0	0	2	0	0	1	3	0	1	5	0			
17:15	Bus		0	0	0	3	0	0	0	7	0	0	6	2		2,225	
17:15	Auto	1	7	41	28	30	31	18	12	175	4	28	183	13	617		
to	Truck		0	0	1	0	0	1	1	6	0	1	9	1			
17:30	Bus		0	0	0	2	0	0	0	10	0	0	11	4		2,331	
17:30	Auto		8	24	46	24	26	7	12	188	1	15	180	14	574		
to	Truck		0	0	1	0	0	0	1	4	0	0	6	0			
17:45	Bus		0	0	0	3	0	0	0	5	0	0	6	3		2,343	
17:45	Auto		7	40	41	24	23	8	15	148	8	18	173	25	588		
to	Truck		0	1	1	0	0	2	3	10	0	0	5	0			
18:00	Bus		0	1	0	5	0	0	0	15	0	0	10	5		2,347	
18:00	Auto		3	36	41	26	19	11	14	188	5	16	157	14	571		
to	Truck		0	0	1	0	0	1	2	11	0	1	5	0			
18:15	Bus		0	0	0	3	0	0	0	8	0	0	7	2		2,350	
18:15	Auto		4	28	34	19	13	8	10	183	1	15	149	12	512		
to	Truck		0	0	0	0	0	0	1	9	0	0	4	0			
18:30	Bus		0	0	0	3	0	0	0	10	0	0	5	4		2,245	
18:30	Auto		7	24	31	25	16	11	9	164	2	15	145	18	499		
to	Truck		1	0	0	0	0	1	0	4	0	1	2	0			
18:45	Bus		0	0	0	3	0	0	0	9	0	0	8	3		2,170	
18:45	Auto		1	19	33	11	14	14	9	160	0	13	140	8	462		
to	Truck		0	0	0	0	0	0	0	11	0	1	5	0			
19:00	Bus		0	0	0	4	0	0	0	7	0	0	6	6		2,044	2,350
Peak Hour Volume (PHV)			25	143	160	117	99	48	60	768	18	79	752	81	2,350		
PHV (by approach)				328			264			846			912				
Peak Hour Factor (PHF)				0.90			0.80			0.93			0.91				
Min. Peak Hour Factor (PHF)				0.83			0.82			0.86			0.87				
Max Peak Hour Factor (PHF)				0.90			0.82			0.93			0.91				
Total Autos				322			247			770			836				
Total Trucks				5			4			38			28				
Total Buses				1			13			38			48				
% Auto				98.2%			93.6%			91.0%			91.7%				
% Heavy Vehicles (Trucks & Buses)				1.8%			6.4%			9.0%			8.3%				

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Liberty Avenue at Merrick Blvd
TIME PERIOD: Tuesday AM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	Merrick Blvd. (NB)			Merrick Blvd. (SB)			Liberty Ave. (EB)			Liberty Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
6:00	Auto		0	0	0	4	35	6	0	47	13	7	100	0	260		
to	Truck		0	0	0	0	0	0	0	10	1	1	4	0			
6:15	Bus		0	0	0	1	12	2	0	1	1	1	14	0			
6:15	Auto		0	0	0	2	38	4	0	56	19	8	157	0	340		
to	Truck		0	0	0	1	0	0	0	8	0	4	12	0			
6:30	Bus		0	0	0	0	8	0	0	6	4	0	13	0			
6:30	Auto		0	0	0	5	68	13	0	70	18	15	190	0	434		
to	Truck		0	0	0	0	2	0	0	6	0	1	9	0			
6:45	Bus		0	0	0	0	7	1	0	5	5	0	19	0			
6:45	Auto		0	0	0	6	73	12	0	84	31	20	202	0	496		
to	Truck		0	0	0	2	0	1	0	14	0	1	15	0			
7:00	Bus		0	0	0	0	8	0	0	5	3	1	18	0		1,530	
7:00	Auto		0	0	0	7	73	11	0	120	31	14	230	0	564		
to	Truck		0	0	0	1	1	1	0	6	1	1	13	0			
7:15	Bus		0	0	0	4	12	3	0	6	5	1	23	0		1,834	
7:15	Auto	1	0	0	0	4	91	10	0	126	25	34	208	0	577		
to	Truck		0	0	0	2	2	0	0	13	3	1	16	0			
7:30	Bus		0	0	0	3	13	0	0	4	4	0	18	0		2,071	
7:30	Auto		0	0	0	8	130	13	0	153	38	23	189	0	614		
to	Truck		0	0	0	0	0	1	0	6	1	1	9	0			
7:45	Bus		0	0	0	3	16	2	0	2	5	0	14	0		2,251	
7:45	Auto		0	0	0	13	143	17	0	164	48	29	216	0	707		
to	Truck		0	0	0	0	1	1	0	11	2	0	17	0			
8:00	Bus		0	0	0	0	20	1	0	5	6	0	13	0		2,462	
8:00	Auto		0	0	0	7	109	19	0	158	37	25	190	0	620		
to	Truck		0	0	0	1	4	0	0	7	1	3	15	0			
8:15	Bus		0	0	0	1	10	2	0	10	5	0	16	0		2,518	
8:15	Auto		0	0	0	8	127	17	0	129	27	39	166	0	587		
to	Truck		0	0	0	3	2	0	0	8	3	1	15	0			
8:30	Bus		0	0	0	3	10	2	0	5	6	0	16	0		2,528	
8:30	Auto		0	0	0	9	107	16	0	140	43	29	201	0	630		
to	Truck		0	0	0	1	2	0	0	13	0	1	11	0			
8:45	Bus		0	0	0	1	21	2	0	8	7	1	17	0		2,544	
8:45	Auto		0	0	0	16	108	24	0	134	39	30	210	0	637		
to	Truck		0	0	0	0	4	0	0	12	1	3	15	0			
9:00	Bus		0	0	0	1	17	0	0	3	3	0	17	0		2,474	2,544
Peak Hour Volume (PHV)			0	0	0	42	539	66	0	659	175	116	921	0	2,518		
PHV (by approach)			0			647			834			1,037					
Peak Hour Factor (PHF)			#DIV/0!			0.83			0.88			0.94					
Min. Peak Hour Factor (PHF)			0.80			0.85			0.86			0.88					
Max Peak Hour Factor (PHF)			#DIV/0!			0.85			0.88			0.94					
Total Autos			0			564			749			914					
Total Trucks			0			12			44			62					
Total Buses			0			71			41			61					
% Auto			#DIV/0!			87.2%			89.8%			88.1%					
% Heavy Vehicles (Trucks & Buses)			#DIV/0!			12.8%			10.2%			11.9%					

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Liberty Avenue at Merrick Blvd
TIME PERIOD: Tuesday PM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	Merrick Blvd. (NB)			Merrick Blvd. (SB)			Liberty Ave. (EB)			Liberty Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
16:00	Auto		0	0	0	10	159	18	0	162	69	27	156	0	663		
to	Truck		0	0	0	1	0	2	0	4	1	6	7	0			
16:15	Bus		0	0	0	1	15	0	0	11	4	0	10	0			
16:15	Auto		0	0	0	9	157	25	0	151	42	38	176	0	657		
to	Truck		0	0	0	0	1	0	0	9	1	0	6	0			
16:30	Bus		0	0	0	0	18	0	0	7	8	0	9	0			
16:30	Auto		0	0	0	9	163	27	0	197	59	39	164	0	721		
to	Truck		0	0	0	1	1	1	0	9	1	3	7	0			
16:45	Bus		0	0	0	0	15	0	0	4	7	0	14	0			
16:45	Auto		0	0	0	10	184	26	0	178	70	33	189	0	760		
to	Truck		0	0	0	0	2	1	0	8	1	4	17	0			
17:00	Bus		0	0	0	1	14	0	0	5	7	0	10	0		2,801	
17:00	Auto		0	0	0	13	177	14	0	187	56	40	190	0	726		
to	Truck		0	0	0	0	1	0	0	7	1	0	5	0			
17:15	Bus		0	0	0	0	14	0	0	5	6	0	10	0		2,864	
17:15	Auto	1	0	0	0	14	196	21	0	165	65	55	196	0	776		
to	Truck		0	0	0	0	1	0	0	4	1	0	14	0			
17:30	Bus		0	0	0	2	16	0	0	7	5	1	13	0		2,983	
17:30	Auto		0	0	0	4	161	21	0	196	77	49	199	0	754		
to	Truck		0	0	0	1	3	0	0	7	0	0	5	0			
17:45	Bus		0	0	0	0	13	1	0	3	4	0	10	0		3,016	
17:45	Auto		0	0	0	10	189	25	0	163	63	41	184	0	742		
to	Truck		0	0	0	2	2	1	0	8	1	1	5	0			
18:00	Bus		0	0	0	0	12	0	0	8	12	0	15	0		2,998	
18:00	Auto		0	0	0	10	158	18	0	164	69	42	181	0	711		
to	Truck		0	0	0	2	2	1	0	15	0	7	6	0			
18:15	Bus		0	0	0	0	12	0	0	7	6	0	11	0		2,983	
18:15	Auto		0	0	0	13	166	23	0	190	78	32	156	0	708		
to	Truck		0	0	0	1	1	0	0	6	3	1	3	0			
18:30	Bus		0	0	0	0	13	0	0	7	6	0	9	0		2,915	
18:30	Auto		0	0	0	11	136	16	0	155	68	34	172	0	635		
to	Truck		0	0	0	1	0	0	0	2	0	1	3	0			
18:45	Bus		0	0	0	0	10	2	0	6	7	0	11	0		2,796	
18:45	Auto		0	0	0	9	142	23	0	176	48	33	141	0	625		
to	Truck		0	0	0	1	0	1	0	11	1	1	6	0			
19:00	Bus		0	0	0	0	7	1	0	7	6	1	10	0		2,679	3,016
Peak Hour Volume (PHV)			0	0	0	45	765	88	0	747	303	196	839	0	2,983		
PHV (by approach)			0			898			1,050			1,035					
Peak Hour Factor (PHF)			#DIV/0!			0.90			0.91			0.93					
Min. Peak Hour Factor (PHF)			0.80			0.87			0.88			0.88					
Max Peak Hour Factor (PHF)			#DIV/0!			0.90			0.91			0.93					
Total Autos			0			827			962			947					
Total Trucks			0			15			36			38					
Total Buses			0			56			52			50					
% Auto			#DIV/0!			92.1%			91.6%			91.5%					
% Heavy Vehicles (Trucks & Buses)			#DIV/0!			7.9%			8.4%			8.5%					

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Liberty Avenue at 168th Street
TIME PERIOD: Tuesday AM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	168th St. (NB)			168th St. (SB)			Liberty Ave. (EB)			Liberty Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
6:00	Auto		45	77	5	0	0	0	16	47	0	0	100	0	343		
to	Truck		0	1	0	0	0	0	4	5	0	0	8	0			
6:15	Bus		8	16	0	0	0	0	0	1	0	0	10	0			
6:15	Auto		51	104	7	0	0	0	16	50	0	0	120	0	397		
to	Truck		1	5	0	0	0	0	1	6	0	0	3	0			
6:30	Bus		6	14	0	0	0	0	1	6	0	0	6	0			
6:30	Auto		62	164	6	0	0	0	14	76	0	0	166	1	539		
to	Truck		1	2	0	0	0	0	0	2	0	0	11	0			
6:45	Bus		7	13	0	0	0	0	0	4	0	0	10	0			
6:45	Auto		85	172	15	0	0	0	16	68	0	0	183	3	609		
to	Truck		0	8	3	0	0	0	1	3	0	0	15	0			
7:00	Bus		7	13	1	0	0	0	2	4	0	0	10	0		1,888	
7:00	Auto		61	160	11	0	0	0	23	91	0	0	200	1	618		
to	Truck		0	4	1	0	0	0	1	5	0	0	7	0			
7:15	Bus		15	19	2	0	0	0	1	6	0	0	10	0		2,163	
7:15	Auto	1	74	158	11	0	0	0	15	88	0	0	149	0	561		
to	Truck		2	3	0	0	0	0	2	6	0	0	12	0			
7:30	Bus		10	14	1	0	0	0	0	6	0	0	10	0		2,327	
7:30	Auto		59	151	11	0	0	0	30	128	0	0	165	1	603		
to	Truck		0	2	1	0	0	0	2	9	0	0	13	0			
7:45	Bus		5	11	1	0	0	0	0	6	0	0	8	0		2,391	
7:45	Auto		45	174	19	0	0	0	30	134	0	0	130	0	591		
to	Truck		0	7	0	0	0	0	2	6	0	0	13	0			
8:00	Bus		9	9	0	0	0	0	0	5	0	0	8	0		2,373	
8:00	Auto		63	130	16	0	0	0	23	123	0	0	165	1	583		
to	Truck		0	0	2	0	0	0	2	8	0	0	16	0			
8:15	Bus		10	12	0	0	0	0	0	4	0	0	8	0		2,338	
8:15	Auto		57	144	15	0	0	0	20	118	0	0	149	1	560		
to	Truck		1	2	0	0	0	0	1	10	0	0	13	0			
8:30	Bus		5	8	1	0	0	0	0	7	0	0	8	0		2,337	
8:30	Auto		74	169	16	0	0	0	27	110	0	0	161	1	620		
to	Truck		0	3	2	0	0	0	2	10	0	0	11	0			
8:45	Bus		6	12	1	0	0	0	1	5	0	0	9	0		2,354	
8:45	Auto		61	121	23	0	0	0	34	116	0	0	170	0	577		
to	Truck		0	2	1	0	0	0	0	4	0	0	14	0			
9:00	Bus		7	12	0	0	0	0	1	5	0	0	6	0		2,340	2,391
Peak Hour Volume (PHV)			277	671	62	0	0	0	106	523	0	0	697	2	2,338		
PHV (by approach)				1,010			0			629			699				
Peak Hour Factor (PHF)				0.92			#DIV/0!			0.89			0.92				
Min. Peak Hour Factor (PHF)				0.87			0.80			0.85			0.85				
Max Peak Hour Factor (PHF)				0.92			#DIV/0!			0.89			0.92				
Total Autos				911			0			571			611				
Total Trucks				17			0			37			54				
Total Buses				82			0			21			34				
% Auto				90.2%			#DIV/0!			90.8%			87.4%				
% Heavy Vehicles (Trucks & Buses)				9.8%			#DIV/0!			9.2%			12.6%				

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Liberty Avenue at 168th Street
TIME PERIOD: Tuesday PM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	168th St. (NB)			168th St. (SB)			Liberty Ave. (EB)			Liberty Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
16:00	Auto		42	91	17	0	0	0	21	180	0	0	159	0	560		
to	Truck		2	2	1	0	0	0	0	4	0	0	10	0			
16:15	Bus		5	15	0	0	0	0	1	6	0	0	4	0			
16:15	Auto		29	90	14	0	0	0	22	158	0	0	171	1	531		
to	Truck		0	0	0	0	0	0	3	3	0	0	5	0			
16:30	Bus		10	15	0	0	0	0	1	5	0	0	4	0			
16:30	Auto		35	103	14	0	0	0	24	161	0	0	172	1	558		
to	Truck		0	0	0	0	0	0	2	6	0	0	11	0			
16:45	Bus		7	12	0	0	0	0	3	4	0	0	3	0			
16:45	Auto		39	92	21	0	0	0	18	166	0	0	191	3	585		
to	Truck		0	3	1	0	0	0	4	10	0	0	11	0			
17:00	Bus		6	11	0	0	0	0	1	4	0	0	4	0		2,234	
17:00	Auto		38	95	19	0	0	0	28	170	0	0	163	1	562		
to	Truck		0	0	1	0	0	0	0	10	0	0	7	0			
17:15	Bus		9	14	0	0	0	0	0	5	0	0	2	0		2,236	
17:15	Auto	1	51	89	26	0	0	0	27	168	0	0	179	1	590		
to	Truck		1	1	0	0	0	0	2	10	0	0	7	0			
17:30	Bus		9	9	0	0	0	0	2	5	0	0	3	0		2,295	
17:30	Auto		45	114	24	0	0	0	16	163	0	0	204	1	615		
to	Truck		1	0	0	0	0	0	1	3	0	0	11	0			
17:45	Bus		7	15	0	0	0	0	1	3	0	0	6	0		2,352	
17:45	Auto		51	115	16	0	0	0	25	178	0	0	194	0	623		
to	Truck		1	2	0	0	0	0	0	6	0	0	4	0			
18:00	Bus		9	12	0	0	0	0	1	4	0	0	5	0		2,390	
18:00	Auto		37	100	19	0	0	0	26	192	0	0	198	2	619		
to	Truck		0	1	1	0	0	0	0	6	0	0	9	0			
18:15	Bus		10	10	0	0	0	0	0	5	0	0	3	0		2,447	
18:15	Auto		39	116	19	0	0	0	26	177	0	0	196	0	609		
to	Truck		0	0	0	0	0	0	0	6	0	0	3	0			
18:30	Bus		6	12	0	0	0	0	1	4	0	0	4	0		2,466	
18:30	Auto		41	66	18	0	0	0	23	139	0	0	159	2	482		
to	Truck		0	1	0	0	0	0	0	7	0	0	5	0			
18:45	Bus		7	6	0	0	0	0	0	6	0	0	2	0		2,333	
18:45	Auto		35	57	15	0	0	0	25	151	0	0	160	0	478		
to	Truck		0	2	0	0	0	0	0	8	0	0	6	0			
19:00	Bus		7	3	0	0	0	0	1	3	0	0	5	0		2,188	2,466
Peak Hour Volume (PHV)			222	468	86	0	0	0	101	743	0	0	823	4	2,447		
PHV (by approach)				776			0			844			827				
Peak Hour Factor (PHF)				0.94			#DIV/0!			0.92			0.93				
Min. Peak Hour Factor (PHF)				0.86			0.80			0.86			0.86				
Max Peak Hour Factor (PHF)				0.94			#DIV/0!			0.92			0.93				
Total Autos				687			0			795			779				
Total Trucks				8			0			28			31				
Total Buses				81			0			21			17				
% Auto				88.5%			#DIV/0!			94.2%			94.2%				
% Heavy Vehicles (Trucks & Buses)				11.5%			#DIV/0!			5.8%			5.8%				

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Merrick Blvd at 107th Ave
TIME PERIOD: Tuesday AM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	Merrick Blvd. (NB)			Merrick Blvd. (SB)			107th Ave. (EB)			107th Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
6:00	Auto		3	112	0	0	33	2	2	0	2	0	0	0	211		
to	Truck		0	5	0	0	2	0	1	0	0	0	0	0			
6:15	Bus		0	15	0	0	12	1	4	0	17	0	0	0			
6:15	Auto		7	153	0	0	49	3	1	0	1	0	0	0	269		
to	Truck		8	0	0	0	1	0	0	0	0	0	0	0			
6:30	Bus		11	0	0	0	13	1	9	0	12	0	0	0			
6:30	Auto		27	245	0	0	77	4	1	0	1	0	0	0	405		
to	Truck		0	5	0	0	3	0	0	0	0	0	0	0			
6:45	Bus		0	16	0	0	12	0	6	0	8	0	0	0			
6:45	Auto		36	220	0	0	92	6	3	0	1	0	0	0	412		
to	Truck		0	4	0	0	3	0	0	0	0	0	0	0			
7:00	Bus		0	19	0	0	13	0	4	0	11	0	0	0		1,297	
7:00	Auto		29	235	0	0	85	5	2	0	0	0	0	0	429		
to	Truck		0	8	0	0	5	0	1	0	0	0	0	0			
7:15	Bus		0	28	0	0	18	1	6	0	6	0	0	0		1,515	
7:15	Auto	1	47	199	0	0	117	4	5	0	1	0	0	0	433		
to	Truck		0	7	0	0	6	0	0	0	1	0	0	0			
7:30	Bus		1	25	0	0	17	0	0	0	3	0	0	0		1,679	
7:30	Auto		28	234	0	0	147	7	2	0	3	0	0	0	472		
to	Truck		1	5	0	0	6	1	1	0	0	0	0	0			
7:45	Bus		0	20	0	0	17	0	0	0	0	0	0	0		1,746	
7:45	Auto		20	225	0	0	162	9	6	0	4	0	0	0	483		
to	Truck		1	6	0	0	7	0	1	0	0	0	0	0			
8:00	Bus		0	15	0	0	24	3	0	0	0	0	0	0		1,817	
8:00	Auto		21	255	0	0	125	5	8	0	0	0	0	0	467		
to	Truck		1	8	0	0	10	0	0	0	0	0	0	0			
8:15	Bus		0	19	0	0	14	1	0	0	0	0	0	0		1,855	
8:15	Auto		22	227	0	0	158	5	6	0	3	0	0	0	470		
to	Truck		0	11	0	0	5	1	0	0	0	0	0	0			
8:30	Bus		0	16	0	0	13	3	0	0	0	0	0	0		1,892	
8:30	Auto		20	203	0	0	127	7	3	0	3	0	0	0	425		
to	Truck		1	9	0	0	10	0	0	0	0	0	0	0			
8:45	Bus		0	17	0	0	12	13	0	0	0	0	0	0		1,845	
8:45	Auto		10	175	0	0	122	11	6	0	2	0	0	0	376		
to	Truck		0	8	0	0	9	0	1	0	0	0	0	0			
9:00	Bus		0	12	0	0	10	10	0	0	0	0	0	0		1,738	1,892
Peak Hour Volume (PHV)			120	1,018	0	0	652	30	23	0	12	0	0	0	1,855		
PHV (by approach)				1,138			682			35			0				
Peak Hour Factor (PHF)				0.94			0.83			0.80			#DIV/0!				
Min. Peak Hour Factor (PHF)				0.88			0.85			0.81			0.80				
Max Peak Hour Factor (PHF)				0.94			0.85			0.81			#DIV/0!				
Total Autos				1,029			576			29			0				
Total Trucks				29			30			3			0				
Total Buses				80			76			3			0				
% Auto				90.4%			84.5%			82.9%			#DIV/0!				
% Heavy Vehicles (Trucks & Buses)				9.6%			15.5%			17.1%			#DIV/0!				

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: Merrick Blvd at 107th Ave
TIME PERIOD: Tuesday PM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	Merrick Blvd. (NB)			Merrick Blvd. (SB)			107th Ave. (EB)			107th Ave. (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
16:00	Auto		7	130	0	0	213	3	2	0	8	0	0	0	413		
to	Truck		1	10	0	0	9	0	0	0	0	0	0	0			
16:15	Bus		0	14	0	0	10	5	0	0	1	0	0	0			
16:15	Auto		6	138	0	0	152	9	4	0	3	0	0	0	363		
to	Truck		0	5	0	0	7	0	0	0	0	0	0	0			
16:30	Bus		2	13	0	0	16	8	0	0	0	0	0	0			
16:30	Auto		12	130	0	0	202	11	3	0	4	0	0	0	418		
to	Truck		0	7	0	0	10	0	0	0	0	0	0	0			
16:45	Bus		1	15	0	0	14	8	1	0	0	0	0	0			
16:45	Auto		9	120	0	0	240	8	5	0	8	0	0	0	444		
to	Truck		0	7	0	0	11	0	0	0	0	0	0	0			
17:00	Bus		1	12	0	0	14	7	2	0	0	0	0	0		1,638	
17:00	Auto		15	117	0	0	194	8	1	0	8	0	0	0	392		
to	Truck		0	6	0	0	6	0	0	0	0	0	0	0			
17:15	Bus		1	14	0	0	14	7	1	0	0	0	0	0		1,617	
17:15	Auto	1	13	136	0	0	238	12	4	0	1	0	0	0	462		
to	Truck		1	5	0	0	8	0	0	0	0	0	0	0			
17:30	Bus		0	21	0	0	18	4	1	0	0	0	0	0		1,716	
17:30	Auto		11	154	0	0	221	8	9	0	2	0	0	0	446		
to	Truck		0	3	0	0	7	0	0	0	0	0	0	0			
17:45	Bus		2	10	0	0	14	4	1	0	0	0	0	0		1,744	
17:45	Auto		9	147	0	0	217	6	6	0	3	0	0	0	440		
to	Truck		0	9	0	0	8	0	0	0	0	0	0	0			
18:00	Bus		1	13	0	0	20	1	0	0	0	0	0	0		1,740	
18:00	Auto		8	141	0	0	218	6	4	0	3	0	0	0	427		
to	Truck		1	4	0	0	7	0	0	0	1	0	0	0			
18:15	Bus		0	15	0	0	17	1	1	0	0	0	0	0		1,775	
18:15	Auto		4	143	0	0	203	5	3	0	2	0	0	0	415		
to	Truck		0	11	0	0	6	0	0	0	0	0	0	0			
18:30	Bus		2	16	0	0	18	2	0	0	0	0	0	0		1,728	
18:30	Auto		8	130	0	0	185	8	5	0	2	0	0	0	387		
to	Truck		0	5	0	0	10	0	0	0	0	0	0	0			
18:45	Bus		1	14	0	0	17	2	0	0	0	0	0	0		1,669	
18:45	Auto		5	98	0	0	199	7	3	0	2	0	0	0	344		
to	Truck		0	3	0	0	5	0	1	0	0	0	0	0			
19:00	Bus		1	8	0	0	12	0	0	0	0	0	0	0		1,573	1,775
Peak Hour Volume (PHV)			46	658	0	0	993	42	26	0	10	0	0	0	1,775		
PHV (by approach)				704			1,035			36			0				
Peak Hour Factor (PHF)				0.98			0.92			0.75			#DIV/0!				
Min. Peak Hour Factor (PHF)				0.85			0.88			0.81			0.80				
Max Peak Hour Factor (PHF)				0.98			0.92			0.81			#DIV/0!				
Total Autos				619			926			32			0				
Total Trucks				23			30			1			0				
Total Buses				62			79			3			0				
% Auto				87.9%			89.5%			88.9%			#DIV/0!				
% Heavy Vehicles (Trucks & Buses)				12.1%			10.5%			11.1%			#DIV/0!				

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: 165th Street at Tuskegee Way
TIME PERIOD: Tuesday AM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	165th St. (NB)			165th St. (SB)			Tuskegee Airmen Way (EB)			Tuskegee Airmen Way (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
6:00	Auto		2	18	0	0	0	8	18	0	0	0	7	0	55		
to	Truck		0	0	0	0	0	0	1	0	0	0	0	0			
6:15	Bus		0	0	0	0	0	0	1	0	0	0	0	0			
6:15	Auto		5	21	0	0	0	5	25	0	0	0	4	2	66		
to	Truck		0	0	0	0	0	0	1	0	0	0	1	0			
6:30	Bus		1	1	0	0	0	0	0	0	0	0	0	0			
6:30	Auto		8	43	0	0	0	12	26	0	0	0	12	1	108		
to	Truck		0	0	0	0	0	0	2	0	0	0	0	0			
6:45	Bus		0	1	0	0	0	0	2	0	0	0	1	0			
6:45	Auto		10	79	0	0	0	19	29	0	0	0	13	2	164		
to	Truck		0	0	0	0	0	0	2	0	0	0	0	0			
7:00	Bus		0	3	0	0	0	0	3	0	0	0	4	0		393	
7:00	Auto		15	67	0	0	0	17	33	0	0	0	13	3	158		
to	Truck		0	0	0	0	0	1	1	0	0	0	1	0			
7:15	Bus		0	1	0	0	0	0	2	0	0	0	4	0		496	
7:15	Auto	1	22	82	0	0	0	16	75	0	0	0	18	1	230		
to	Truck		0	1	0	0	0	3	2	0	0	0	0	0			
7:30	Bus		0	3	0	0	0	1	4	0	0	0	2	0		660	
7:30	Auto		17	69	0	0	0	25	74	0	0	0	18	1	212		
to	Truck		0	0	0	0	0	1	1	0	0	0	0	0			
7:45	Bus		2	1	0	0	0	1	1	0	0	0	1	0		764	
7:45	Auto		24	68	0	0	0	17	67	0	0	0	21	0	204		
to	Truck		0	0	0	0	0	0	2	0	0	0	1	0			
8:00	Bus		0	1	0	0	0	1	1	0	0	0	1	0		804	
8:00	Auto		15	49	0	0	0	22	70	0	0	0	25	3	195		
to	Truck		0	0	0	0	0	3	3	0	0	0	2	0			
8:15	Bus		0	1	0	0	0	1	1	0	0	0	0	0		841	
8:15	Auto		7	46	0	0	0	22	59	0	0	0	18	0	160		
to	Truck		0	0	0	0	0	1	3	0	0	0	1	0			
8:30	Bus		0	0	0	0	0	1	2	0	0	0	0	0		771	
8:30	Auto		11	40	0	0	0	26	57	0	0	0	19	1	159		
to	Truck		0	0	0	0	0	3	0	0	0	0	1	0			
8:45	Bus		0	0	0	0	0	0	0	0	0	0	0	1		718	
8:45	Auto		13	25	0	0	0	22	49	0	0	0	20	0	135		
to	Truck		0	0	0	0	0	1	1	0	0	0	1	0			
9:00	Bus		0	0	0	0	0	0	1	0	0	0	2	0		649	841
Peak Hour Volume (PHV)			80	275	0	0	0	91	301	0	0	0	89	5	841		
PHV (by approach)				355			91			301			94				
Peak Hour Factor (PHF)				0.82			0.84			0.93			0.78				
Min. Peak Hour Factor (PHF)				0.83			0.81			0.82			0.81				
Max Peak Hour Factor (PHF)				0.83			0.84			0.93			0.81				
Total Autos				346			80			286			87				
Total Trucks				1			7			8			3				
Total Buses				8			4			7			4				
% Auto				97.5%			87.9%			95.0%			92.6%				
% Heavy Vehicles (Trucks & Buses)				2.5%			12.1%			5.0%			7.4%				

PROJECT: Jamaica Bus Depot
FILE NAME: TMC_Summary.xls
LOCATION: 165th Street at Tuskegee Way
TIME PERIOD: Tuesday PM Peak Period
COUNT DATE : 10/23/18
WEATHER/PAVEMENT:
PRINT TIME : 04/02/19
10:30 AM

TURNING MOVEMENT COUNT SUMMARY

TIME PERIOD	VEHICLE CLASS.	INPUT "1" AT START OF PEAK HOUR	165th St. (NB)			165th St. (SB)			Tuskegee Airmen Way (EB)			Tuskegee Airmen Way (WB)			15-MIN. VOLUME	HOURLY VOLUME	HIGHEST HOURLY VOLUME
			2	3	4	7	8	9	12	13	14	17	18	19			
			L	T	R	L	T	R	L	T	R	L	T	R			
16:00	Auto		4	14	0	0	0	32	58	0	0	0	28	5	157		
to	Truck		1	2	0	0	0	1	1	0	0	0	1	0			
16:15	Bus		0	2	0	0	0	3	3	0	0	0	1	1			
16:15	Auto		3	20	0	0	0	34	60	0	0	0	29	2	151		
to	Truck		0	0	0	0	0	1	0	0	0	0	1	0			
16:30	Bus		0	0	0	0	0	0	0	0	0	0	1	0			
16:30	Auto		4	13	0	0	0	35	69	0	0	0	32	2	159		
to	Truck		0	0	0	0	0	1	1	0	0	0	0	0			
16:45	Bus		0	0	0	0	0	2	0	0	0	0	0	0			
16:45	Auto		6	16	0	0	0	45	49	0	0	0	25	1	145		
to	Truck		0	0	0	0	0	2	0	0	0	0	1	0			
17:00	Bus		0	0	0	0	0	0	0	0	0	0	0	0		612	
17:00	Auto		12	14	0	0	0	51	45	0	0	0	34	2	160		
to	Truck		0	0	0	0	0	1	0	0	0	0	0	0			
17:15	Bus		0	0	0	0	0	1	0	0	0	0	0	0		615	
17:15	Auto	1	10	23	0	0	0	59	51	0	0	0	28	1	176		
to	Truck		0	1	0	0	0	1	1	0	0	0	0	0			
17:30	Bus		0	0	0	0	0	0	1	0	0	0	0	0		640	
17:30	Auto		9	17	0	0	0	45	61	0	0	0	29	1	163		
to	Truck		0	0	0	0	0	0	1	0	0	0	0	0			
17:45	Bus		0	0	0	0	0	0	0	0	0	0	0	0		644	
17:45	Auto		4	15	0	0	0	44	68	0	0	0	26	1	164		
to	Truck		0	0	0	0	0	1	2	0	0	0	2	0			
18:00	Bus		0	0	0	0	0	0	0	0	0	0	0	1		663	
18:00	Auto		10	14	0	0	0	44	60	0	0	0	33	1	171		
to	Truck		0	0	0	0	0	1	4	0	0	0	3	0			
18:15	Bus		0	0	0	0	0	0	1	0	0	0	0	0		674	
18:15	Auto		7	16	0	0	0	32	49	0	0	0	23	0	129		
to	Truck		0	0	0	0	0	0	0	0	0	0	0	0			
18:30	Bus		0	0	0	0	0	0	2	0	0	0	0	0		627	
18:30	Auto		3	22	0	0	0	30	43	0	0	0	27	1	127		
to	Truck		0	0	0	0	0	1	0	0	0	0	0	0			
18:45	Bus		0	0	0	0	0	0	0	0	0	0	0	0		591	
18:45	Auto		3	6	0	0	0	31	43	0	0	0	16	3	104		
to	Truck		0	0	0	0	0	0	1	0	0	0	1	0			
19:00	Bus		0	0	0	0	0	0	0	0	0	0	0	0		531	674
Peak Hour Volume (PHV)			33	70	0	0	0	195	250	0	0	0	121	5	674		
PHV (by approach)			103			195			250			126					
Peak Hour Factor (PHF)			0.76			0.81			0.89			0.85					
Min. Peak Hour Factor (PHF)			0.81			0.82			0.82			0.81					
Max Peak Hour Factor (PHF)			0.81			0.82			0.89			0.85					
Total Autos			102			192			240			120					
Total Trucks			1			3			8			5					
Total Buses			0			0			2			1					
% Auto			99.0%			98.5%			96.0%			95.2%					
% Heavy Vehicles (Trucks & Buses)			1.0%			1.5%			4.0%			4.8%					

Crash Data

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Intersection Traffic Safety Report

Archer Ave. at 165th St., QN

Injury Summary, 2012-2016 (5 Years)

	Total Injuries	Severe Injuries	Fatalities	KSI
Pedestrian	5	1	0	1
Bicyclist	1	0	0	0
Motor Vehicle Occupant	33	1	0	1
Total	39	2	0	2

Fatalities, 01/01/2012-10/29/2018 : None

Source: Fatalities: NYCDOT
Injuries: NYSDOT
KSI: Persons Killed or Severely Injured

Non-Fatal Injuries by Severity, 2012-2016

Severity	Pedestrian	Bicyclist	Motor Vehicle	Total
A	1	0	1	2
B	1	0	1	2
C	3	1	28	32
Unknown	0	0	3	3
Total	5	1	33	39

Severity reported as classified by NYS Dept. of Motor Vehicles.
A: Severe B: Moderate C: Minor
KSI (Persons Killed or Severely Injured): NYCDOT Fatalities + NYSDOT "A" Injuries

Injuries by Year, 2012-2016

Year	Pedestrian	Bicyclist	Motor Vehicle	Total
2012	2	1	12	15
2013	0	0	5	5
2014	1	0	2	3
2015	1	0	12	13
2016	1	0	2	3
Total	5	1	33	39

Crashes by Time of Day by Type, 2012-2016

Time	Pedestrian	Bicyclist	Motor Vehicle	Total	Percent of Known Crashes	Percent of Known Crashes(Boro)
00:00-03:00	0	0	0	0	0%	8.7%
03:00-06:00	0	0	0	0	0%	4%
06:00-09:00	0	0	1	1	4.8%	11.8%
09:00-12:00	0	0	5	5	23.8%	14.3%
12:00-15:00	2	0	3	5	23.8%	16.2%
15:00-18:00	0	1	3	4	19%	19.7%
18:00-21:00	3	0	1	4	19%	16.2%
21:00-24:00	0	0	2	2	9.5%	9%
Unknown	0	0	0	0	N/A	N/A
Total	5	1	15	21	N/A	N/A

Pedestrian Crashes by Control and Pedestrian Action, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	3	100%	33.9%
Signalized Intersection: Crossing Against Signal	0	0%	7.3%
Stop-Controlled Intersection / Crosswalk	0	0%	8%
Other Actions/Uncontrolled Intersection	0	0%	24.9%
Midblock	0	0%	26%
Other Control Types	0	0%	0%
Total Known	3	100%	100%
Unknown/Indeterminate	2	N/A	N/A
Total	5	N/A	N/A

Source:Injury data:NYSDOT/NYSDMV Accident Database
Fatality data:NYCDOT/NYPD Reconciled Fatality Database

Bicycle Crashes by Intersection Control and Bicyclist Action, 2012-2016

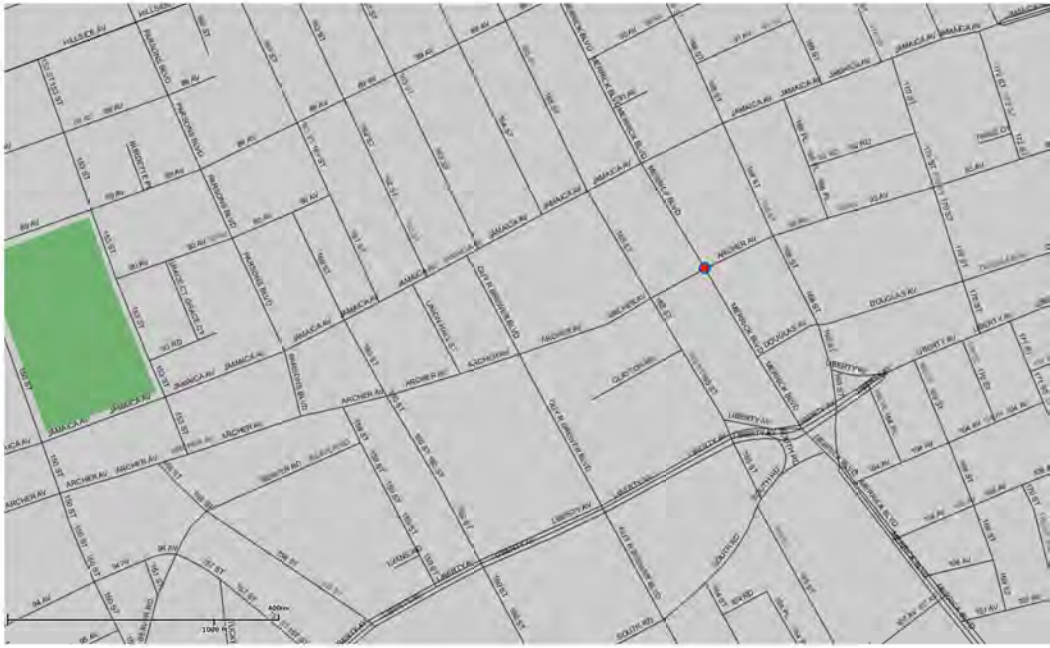
	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	0	N/A	11.4%
Signalized Intersection: Crossing Against Signal	0	N/A	10.3%
Stop-Controlled Intersection / Crosswalk	0	N/A	19.5%
Other Actions/Uncontrolled Intersection	0	N/A	33.4%
Midblock	0	N/A	25.4%
Other Control Types	0	N/A	0%
Total Known	0	N/A	100%
Unknown/Indeterminate	1	N/A	N/A
Total	1	N/A	N/A

Motor Vehicle Crashes by Collision Type, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Left Turn	1	25%	8.7%
Right Turn	0	0%	2.4%
Rear-End	0	0%	25.4%
Right-Angle	1	25%	23.3%
Sideswipe (Same Direction)	1	25%	14.8%
Head-on	0	0%	1.4%
Sideswipe (Opposite Direction)	0	0%	1.5%
Other Known	1	25%	22.5%
Total Known	4	100%	100%
Unknown	11	N/A	N/A
Total	15	N/A	N/A

Intersection Traffic Safety Report

Archer Ave. at Merrick Blvd., QN



Injury Summary, 2012-2016 (5 Years)

	Total Injuries	Severe Injuries	Fatalities	KSI
Pedestrian	10	2	0	2
Bicyclist	0	0	0	0
Motor Vehicle Occupant	18	0	0	0
Total	28	2	0	2

Fatalities, 01/01/2012-10/29/2018 : None

Source: Fatalities: NYCDOT
Injuries: NYSDOT
KSI: Persons Killed or Severely Injured

Non-Fatal Injuries by Severity, 2012-2016

Severity	Pedestrian	Bicyclist	Motor Vehicle	Total
A	2	0	0	2
B	1	0	2	3
C	7	0	16	23
Unknown	0	0	0	0
Total	10	0	18	28

Severity reported as classified by NYS Dept. of Motor Vehicles.
A: Severe B: Moderate C: Minor
KSI (Persons Killed or Severely Injured): NYCDOT Fatalities + NYSDOT "A" Injuries

Injuries by Year, 2012-2016

Year	Pedestrian	Bicyclist	Motor Vehicle	Total
2012	0	0	5	5
2013	4	0	5	9
2014	3	0	3	6
2015	1	0	2	3
2016	2	0	3	5
Total	10	0	18	28

Crashes by Time of Day by Type, 2012-2016

Time	Pedestrian	Bicyclist	Motor Vehicle	Total	Percent of Known Crashes	Percent of Known Crashes(Boro)
00:00-03:00	0	0	3	3	9.1%	8.7%
03:00-06:00	0	0	0	0	0%	4%
06:00-09:00	0	0	1	1	3%	11.8%
09:00-12:00	3	0	3	6	18.2%	14.3%
12:00-15:00	0	0	4	4	12.1%	16.2%
15:00-18:00	1	0	8	9	27.3%	19.7%
18:00-21:00	6	0	3	9	27.3%	16.2%
21:00-24:00	0	0	1	1	3%	9%
Unknown	0	0	0	0	N/A	N/A
Total	10	0	23	33	N/A	N/A

Pedestrian Crashes by Control and Pedestrian Action, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	6	75%	33.9%
Signalized Intersection: Crossing Against Signal	0	0%	7.3%
Stop-Controlled Intersection / Crosswalk	0	0%	8%
Other Actions/Uncontrolled Intersection	1	12.5%	24.9%
Midblock	1	12.5%	26%
Other Control Types	0	0%	0%
Total Known	8	100%	100%
Unknown/Indeterminate	2	N/A	N/A
Total	10	N/A	N/A

Source:Injury data:NYSDOT/NYSDMV Accident Database
Fatality data:NYCDOT/NYPD Reconciled Fatality Database

Bicycle Crashes by Intersection Control and Bicyclist Action, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	0	N/A	11.4%
Signalized Intersection: Crossing Against Signal	0	N/A	10.3%
Stop-Controlled Intersection / Crosswalk	0	N/A	19.5%
Other Actions/Uncontrolled Intersection	0	N/A	33.4%
Midblock	0	N/A	25.4%
Other Control Types	0	N/A	0%
Total Known	0	N/A	100%
Unknown/Indeterminate	0	N/A	N/A
Total	0	N/A	N/A

Motor Vehicle Crashes by Collision Type, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Left Turn	1	9.1%	8.7%
Right Turn	0	0%	2.4%
Rear-End	4	36.4%	25.4%
Right-Angle	2	18.2%	23.3%
Sideswipe (Same Direction)	2	18.2%	14.8%
Head-on	0	0%	1.4%
Sideswipe (Opposite Direction)	0	0%	1.5%
Other Known	2	18.2%	22.5%
Total Known	11	100%	100%
Unknown	12	N/A	N/A
Total	23	N/A	N/A

Intersection Traffic Safety Report

Archer Ave. at 168th St., QN

Injury Summary, 2012-2016 (5 Years)

	Total Injuries	Severe Injuries	Fatalities	KSI
Pedestrian	10	0	0	0
Bicyclist	0	0	0	0
Motor Vehicle Occupant	9	1	0	1
Total	19	1	0	1

Fatalities, 01/01/2012-10/29/2018 : None

Source: Fatalities: NYCDOT
Injuries: NYSDOT
KSI: Persons Killed or Severely Injured

Non-Fatal Injuries by Severity, 2012-2016

Severity	Pedestrian	Bicyclist	Motor Vehicle	Total
A	0	0	1	1
B	0	0	1	1
C	10	0	7	17
Unknown	0	0	0	0
Total	10	0	9	19

Severity reported as classified by NYS Dept. of Motor Vehicles.
A: Severe B: Moderate C: Minor
KSI (Persons Killed or Severely Injured): NYCDOT Fatalities + NYSDOT "A" Injuries

Injuries by Year, 2012-2016

Year	Pedestrian	Bicyclist	Motor Vehicle	Total
2012	2	0	0	2
2013	2	0	2	4
2014	2	0	4	6
2015	4	0	2	6
2016	0	0	1	1
Total	10	0	9	19

Crashes by Time of Day by Type, 2012-2016

Time	Pedestrian	Bicyclist	Motor Vehicle	Total	Percent of Known Crashes	Percent of Known Crashes(Boro)
00:00-03:00	0	0	1	1	4.3%	8.7%
03:00-06:00	0	0	0	0	0%	4%
06:00-09:00	3	0	3	6	26.1%	11.8%
09:00-12:00	1	0	1	2	8.7%	14.3%
12:00-15:00	0	0	5	5	21.7%	16.2%
15:00-18:00	4	0	3	7	30.4%	19.7%
18:00-21:00	2	0	0	2	8.7%	16.2%
21:00-24:00	0	0	0	0	0%	9%
Unknown	0	0	0	0	N/A	N/A
Total	10	0	13	23	N/A	N/A

Pedestrian Crashes by Control and Pedestrian Action, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	4	80%	33.9%
Signalized Intersection: Crossing Against Signal	0	0%	7.3%
Stop-Controlled Intersection / Crosswalk	0	0%	8%
Other Actions/Uncontrolled Intersection	0	0%	24.9%
Midblock	1	20%	26%
Other Control Types	0	0%	0%
Total Known	5	100%	100%
Unknown/Indeterminate	5	N/A	N/A
Total	10	N/A	N/A

Source:Injury data:NYSDOT/NYSDMV Accident Database
Fatality data:NYCDOT/NYPD Reconciled Fatality Database

Bicycle Crashes by Intersection Control and Bicyclist Action, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	0	N/A	11.4%
Signalized Intersection: Crossing Against Signal	0	N/A	10.3%
Stop-Controlled Intersection / Crosswalk	0	N/A	19.5%
Other Actions/Uncontrolled Intersection	0	N/A	33.4%
Midblock	0	N/A	25.4%
Other Control Types	0	N/A	0%
Total Known	0	N/A	100%
Unknown/Indeterminate	0	N/A	N/A
Total	0	N/A	N/A

Motor Vehicle Crashes by Collision Type, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Left Turn	1	14.3%	8.7%
Right Turn	0	0%	2.4%
Rear-End	1	14.3%	25.4%
Right-Angle	1	14.3%	23.3%
Sideswipe (Same Direction)	2	28.6%	14.8%
Head-on	0	0%	1.4%
Sideswipe (Opposite Direction)	0	0%	1.5%
Other Known	2	28.6%	22.5%
Total Known	7	100%	100%
Unknown	6	N/A	N/A
Total	13	N/A	N/A

Intersection Traffic Safety Report

Liberty Ave. at 165th St., QN

Injury Summary, 2012-2016 (5 Years)

	Total Injuries	Severe Injuries	Fatalities	KSI
Pedestrian	2	0	0	0
Bicyclist	0	0	0	0
Motor Vehicle Occupant	14	1	0	1
Total	16	1	0	1

Fatalities, 01/01/2012-10/29/2018 : None

Source: Fatalities: NYCDOT
Injuries: NYSDOT
KSI: Persons Killed or Severely Injured

Non-Fatal Injuries by Severity, 2012-2016

Severity	Pedestrian	Bicyclist	Motor Vehicle	Total
A	0	0	1	1
B	0	0	0	0
C	1	0	13	14
Unknown	1	0	0	1
Total	2	0	14	16

Severity reported as classified by NYS Dept. of Motor Vehicles.
A: Severe B: Moderate C: Minor
KSI (Persons Killed or Severely Injured): NYCDOT Fatalities + NYSDOT "A" Injuries

Injuries by Year, 2012-2016

Year	Pedestrian	Bicyclist	Motor Vehicle	Total
2012	0	0	5	5
2013	1	0	5	6
2014	0	0	0	0
2015	1	0	3	4
2016	0	0	1	1
Total	2	0	14	16

Crashes by Time of Day by Type, 2012-2016

Time	Pedestrian	Bicyclist	Motor Vehicle	Total	Percent of Known Crashes	Percent of Known Crashes(Boro)
00:00-03:00	0	0	1	1	6.2%	8.7%
03:00-06:00	0	0	0	0	0%	4%
06:00-09:00	2	0	1	3	18.8%	11.8%
09:00-12:00	0	0	2	2	12.5%	14.3%
12:00-15:00	0	0	2	2	12.5%	16.2%
15:00-18:00	0	0	4	4	25%	19.7%
18:00-21:00	0	0	3	3	18.8%	16.2%
21:00-24:00	0	0	1	1	6.2%	9%
Unknown	0	0	0	0	N/A	N/A
Total	2	0	14	16	N/A	N/A

Pedestrian Crashes by Control and Pedestrian Action, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	0	0%	33.9%
Signalized Intersection: Crossing Against Signal	1	100%	7.3%
Stop-Controlled Intersection / Crosswalk	0	0%	8%
Other Actions/Uncontrolled Intersection	0	0%	24.9%
Midblock	0	0%	26%
Other Control Types	0	0%	0%
Total Known	1	100%	100%
Unknown/Indeterminate	1	N/A	N/A
Total	2	N/A	N/A

Source:Injury data:NYSDOT/NYSDMV Accident Database
Fatality data:NYCDOT/NYPD Reconciled Fatality Database

Bicycle Crashes by Intersection Control and Bicyclist Action, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	0	N/A	11.4%
Signalized Intersection: Crossing Against Signal	0	N/A	10.3%
Stop-Controlled Intersection / Crosswalk	0	N/A	19.5%
Other Actions/Uncontrolled Intersection	0	N/A	33.4%
Midblock	0	N/A	25.4%
Other Control Types	0	N/A	0%
Total Known	0	N/A	100%
Unknown/Indeterminate	0	N/A	N/A
Total	0	N/A	N/A

Motor Vehicle Crashes by Collision Type, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Left Turn	2	20%	8.7%
Right Turn	1	10%	2.4%
Rear-End	3	30%	25.4%
Right-Angle	1	10%	23.3%
Sideswipe (Same Direction)	1	10%	14.8%
Head-on	0	0%	1.4%
Sideswipe (Opposite Direction)	0	0%	1.5%
Other Known	2	20%	22.5%
Total Known	10	100%	100%
Unknown	4	N/A	N/A
Total	14	N/A	N/A

Intersection Traffic Safety Report

Liberty Ave. at Merrick Blvd., QN

Injury Summary, 2012-2016 (5 Years)

	Total Injuries	Severe Injuries	Fatalities	KSI
Pedestrian	0	0	0	0
Bicyclist	0	0	0	0
Motor Vehicle Occupant	19	1	0	1
Total	19	1	0	1

Fatalities, 01/01/2012-10/29/2018 : None

Source: Fatalities: NYCDOT
Injuries: NYSDOT
KSI: Persons Killed or Severely Injured

Non-Fatal Injuries by Severity, 2012-2016

Severity	Pedestrian	Bicyclist	Motor Vehicle	Total
A	0	0	1	1
B	0	0	0	0
C	0	0	18	18
Unknown	0	0	0	0
Total	0	0	19	19

Severity reported as classified by NYS Dept. of Motor Vehicles.
A: Severe B: Moderate C: Minor
KSI (Persons Killed or Severely Injured): NYCDOT Fatalities + NYSDOT "A" Injuries

Injuries by Year, 2012-2016

Year	Pedestrian	Bicyclist	Motor Vehicle	Total
2012	0	0	3	3
2013	0	0	5	5
2014	0	0	2	2
2015	0	0	5	5
2016	0	0	4	4
Total	0	0	19	19

Crashes by Time of Day by Type, 2012-2016

Time	Pedestrian	Bicyclist	Motor Vehicle	Total	Percent of Known Crashes	Percent of Known Crashes(Boro)
00:00-03:00	0	0	2	2	12.5%	8.7%
03:00-06:00	0	0	0	0	0%	4%
06:00-09:00	0	0	2	2	12.5%	11.8%
09:00-12:00	0	0	0	0	0%	14.3%
12:00-15:00	0	0	1	1	6.2%	16.2%
15:00-18:00	0	0	5	5	31.2%	19.7%
18:00-21:00	0	0	4	4	25%	16.2%
21:00-24:00	0	0	2	2	12.5%	9%
Unknown	0	0	0	0	N/A	N/A
Total	0	0	16	16	N/A	N/A

Pedestrian Crashes by Control and Pedestrian Action, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	0	N/A	33.9%
Signalized Intersection: Crossing Against Signal	0	N/A	7.3%
Stop-Controlled Intersection / Crosswalk	0	N/A	8%
Other Actions/Uncontrolled Intersection	0	N/A	24.9%
Midblock	0	N/A	26%
Other Control Types	0	N/A	0%
Total Known	0	N/A	100%
Unknown/Indeterminate	0	N/A	N/A
Total	0	N/A	N/A

Source:Injury data:NYSDOT/NYSDMV Accident Database
Fatality data:NYCDOT/NYPD Reconciled Fatality Database

Bicycle Crashes by Intersection Control and Bicyclist Action, 2012-2016

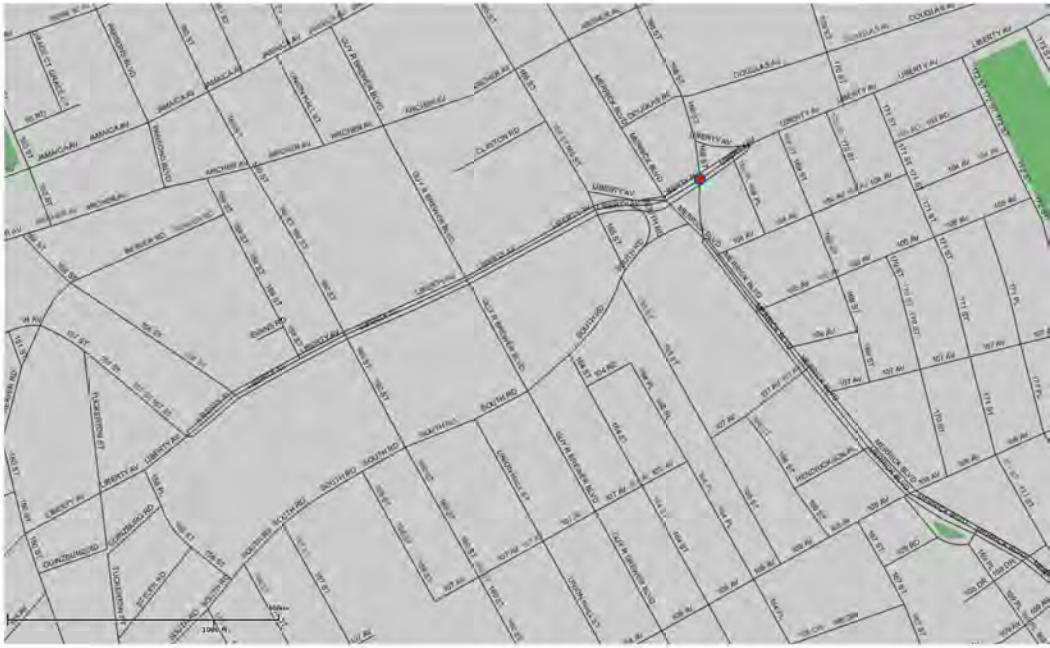
	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	0	N/A	11.4%
Signalized Intersection: Crossing Against Signal	0	N/A	10.3%
Stop-Controlled Intersection / Crosswalk	0	N/A	19.5%
Other Actions/Uncontrolled Intersection	0	N/A	33.4%
Midblock	0	N/A	25.4%
Other Control Types	0	N/A	0%
Total Known	0	N/A	100%
Unknown/Indeterminate	0	N/A	N/A
Total	0	N/A	N/A

Motor Vehicle Crashes by Collision Type, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Left Turn	1	8.3%	8.7%
Right Turn	0	0%	2.4%
Rear-End	1	8.3%	25.4%
Right-Angle	5	41.7%	23.3%
Sideswipe (Same Direction)	3	25%	14.8%
Head-on	0	0%	1.4%
Sideswipe (Opposite Direction)	0	0%	1.5%
Other Known	2	16.7%	22.5%
Total Known	12	100%	100%
Unknown	4	N/A	N/A
Total	16	N/A	N/A

Intersection Traffic Safety Report

Liberty Ave. at 168th St., QN



Injury Summary, 2012-2016 (5 Years)

	Total Injuries	Severe Injuries	Fatalities	KSI
Pedestrian	2	0	0	0
Bicyclist	2	0	0	0
Motor Vehicle Occupant	44	0	0	0
Total	48	0	0	0

Fatalities, 01/01/2012-10/29/2018 : None

Source: Fatalities: NYCDOT
Injuries: NYSDOT
KSI: Persons Killed or Severely Injured

Non-Fatal Injuries by Severity, 2012-2016

Severity	Pedestrian	Bicyclist	Motor Vehicle	Total
A	0	0	0	0
B	0	1	0	1
C	2	1	44	47
Unknown	0	0	0	0
Total	2	2	44	48

Severity reported as classified by NYS Dept. of Motor Vehicles.
A: Severe B: Moderate C: Minor
KSI (Persons Killed or Severely Injured): NYCDOT Fatalities + NYSDOT "A" Injuries

Injuries by Year, 2012-2016

Year	Pedestrian	Bicyclist	Motor Vehicle	Total
2012	0	0	1	1
2013	0	1	8	9
2014	1	0	9	10
2015	1	1	8	10
2016	0	0	18	18
Total	2	2	44	48

Crashes by Time of Day by Type, 2012-2016

Time	Pedestrian	Bicyclist	Motor Vehicle	Total	Percent of Known Crashes	Percent of Known Crashes(Boro)
00:00-03:00	0	0	3	3	7.3%	8.7%
03:00-06:00	0	0	1	1	2.4%	4%
06:00-09:00	0	0	2	2	4.9%	11.8%
09:00-12:00	1	1	6	8	19.5%	14.3%
12:00-15:00	0	1	5	6	14.6%	16.2%
15:00-18:00	0	0	6	6	14.6%	19.7%
18:00-21:00	1	0	8	9	22%	16.2%
21:00-24:00	0	0	6	6	14.6%	9%
Unknown	0	0	0	0	N/A	N/A
Total	2	2	37	41	N/A	N/A

Pedestrian Crashes by Control and Pedestrian Action, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	1	100%	33.9%
Signalized Intersection: Crossing Against Signal	0	0%	7.3%
Stop-Controlled Intersection / Crosswalk	0	0%	8%
Other Actions/Uncontrolled Intersection	0	0%	24.9%
Midblock	0	0%	26%
Other Control Types	0	0%	0%
Total Known	1	100%	100%
Unknown/Indeterminate	1	N/A	N/A
Total	2	N/A	N/A

Source:Injury data:NYSDOT/NYSDMV Accident Database
Fatality data:NYCDOT/NYPD Reconciled Fatality Database

Bicycle Crashes by Intersection Control and Bicyclist Action, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	1	100%	11.4%
Signalized Intersection: Crossing Against Signal	0	0%	10.3%
Stop-Controlled Intersection / Crosswalk	0	0%	19.5%
Other Actions/Uncontrolled Intersection	0	0%	33.4%
Midblock	0	0%	25.4%
Other Control Types	0	0%	0%
Total Known	1	100%	100%
Unknown/Indeterminate	1	N/A	N/A
Total	2	N/A	N/A

Motor Vehicle Crashes by Collision Type, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Left Turn	2	11.1%	8.7%
Right Turn	0	0%	2.4%
Rear-End	0	0%	25.4%
Right-Angle	5	27.8%	23.3%
Sideswipe (Same Direction)	8	44.4%	14.8%
Head-on	0	0%	1.4%
Sideswipe (Opposite Direction)	0	0%	1.5%
Other Known	3	16.7%	22.5%
Total Known	18	100%	100%
Unknown	19	N/A	N/A
Total	37	N/A	N/A

Intersection Traffic Safety Report

Merrick Blvd. at 107th Ave., QN

Injury Summary, 2012-2016 (5 Years)

	Total Injuries	Severe Injuries	Fatalities	KSI
Pedestrian	2	0	0	0
Bicyclist	0	0	0	0
Motor Vehicle Occupant	18	0	0	0
Total	20	0	0	0

Fatalities, 01/01/2012-10/29/2018 : None

Source: Fatalities: NYCDOT
Injuries: NYSDOT
KSI: Persons Killed or Severely Injured

Non-Fatal Injuries by Severity, 2012-2016

Severity	Pedestrian	Bicyclist	Motor Vehicle	Total
A	0	0	0	0
B	0	0	2	2
C	2	0	16	18
Unknown	0	0	0	0
Total	2	0	18	20

Severity reported as classified by NYS Dept. of Motor Vehicles.
A: Severe B: Moderate C: Minor
KSI (Persons Killed or Severely Injured): NYCDOT Fatalities + NYSDOT "A" Injuries

Injuries by Year, 2012-2016

Year	Pedestrian	Bicyclist	Motor Vehicle	Total
2012	1	0	7	8
2013	1	0	3	4
2014	0	0	3	3
2015	0	0	5	5
2016	0	0	0	0
Total	2	0	18	20

Crashes by Time of Day by Type, 2012-2016

Time	Pedestrian	Bicyclist	Motor Vehicle	Total	Percent of Known Crashes	Percent of Known Crashes(Boro)
00:00-03:00	0	0	0	0	0%	8.7%
03:00-06:00	1	0	0	1	6.2%	4%
06:00-09:00	0	0	3	3	18.8%	11.8%
09:00-12:00	0	0	3	3	18.8%	14.3%
12:00-15:00	0	0	1	1	6.2%	16.2%
15:00-18:00	0	0	3	3	18.8%	19.7%
18:00-21:00	1	0	3	4	25%	16.2%
21:00-24:00	0	0	1	1	6.2%	9%
Unknown	0	0	0	0	N/A	N/A
Total	2	0	14	16	N/A	N/A

Pedestrian Crashes by Control and Pedestrian Action, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	0	0%	33.9%
Signalized Intersection: Crossing Against Signal	0	0%	7.3%
Stop-Controlled Intersection / Crosswalk	0	0%	8%
Other Actions/Uncontrolled Intersection	1	100%	24.9%
Midblock	0	0%	26%
Other Control Types	0	0%	0%
Total Known	1	100%	100%
Unknown/Indeterminate	1	N/A	N/A
Total	2	N/A	N/A

Source:Injury data:NYSDOT/NYSDMV Accident Database
Fatality data:NYCDOT/NYPD Reconciled Fatality Database

Bicycle Crashes by Intersection Control and Bicyclist Action, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	0	N/A	11.4%
Signalized Intersection: Crossing Against Signal	0	N/A	10.3%
Stop-Controlled Intersection / Crosswalk	0	N/A	19.5%
Other Actions/Uncontrolled Intersection	0	N/A	33.4%
Midblock	0	N/A	25.4%
Other Control Types	0	N/A	0%
Total Known	0	N/A	100%
Unknown/Indeterminate	0	N/A	N/A
Total	0	N/A	N/A

Motor Vehicle Crashes by Collision Type, 2012-2016

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Left Turn	0	0%	8.7%
Right Turn	0	0%	2.4%
Rear-End	4	44.4%	25.4%
Right-Angle	1	11.1%	23.3%
Sideswipe (Same Direction)	1	11.1%	14.8%
Head-on	0	0%	1.4%
Sideswipe (Opposite Direction)	0	0%	1.5%
Other Known	3	33.3%	22.5%
Total Known	9	100%	100%
Unknown	5	N/A	N/A
Total	14	N/A	N/A

Intersection Traffic Safety Report

Tuskegee Airmen Way at 165th St., QN

Injury Summary, 2013-2017 (5 Years)

	Total Injuries	Severe Injuries	Fatalities	KSI
Pedestrian	0	0	0	0
Bicyclist	0	0	0	0
Motor Vehicle Occupant	5	0	0	0
Total	5	0	0	0

Fatalities, 01/01/2013-12/31/2019 : None

Source: Fatalities: NYCDOT
Injuries: NYSDOT
KSI: Persons Killed or Severely Injured

Non-Fatal Injuries by Severity, 2013-2017

Severity	Pedestrian	Bicyclist	Motor Vehicle	Total
A	0	0	0	0
B	0	0	0	0
C	0	0	5	5
Unknown	0	0	0	0
Total	0	0	5	5

Severity reported as classified by NYS Dept. of Motor Vehicles.
A: Severe B: Moderate C: Minor
KSI (Persons Killed or Severely Injured): NYCDOT Fatalities + NYSDOT "A" Injuries

Injuries by Year, 2013-2017

Year	Pedestrian	Bicyclist	Motor Vehicle	Total
2013	0	0	2	2
2014	0	0	0	0
2015	0	0	0	0
2016	0	0	1	1
2017	0	0	2	2
Total	0	0	5	5

Crashes by Time of Day by Type, 2013-2017

Time	Pedestrian	Bicyclist	Motor Vehicle	Total	Percent of Known Crashes	Percent of Known Crashes(Boro)
00:00-03:00	0	0	1	1	33.3%	8.6%
03:00-06:00	0	0	1	1	33.3%	4.2%
06:00-09:00	0	0	0	0	0%	12.1%
09:00-12:00	0	0	0	0	0%	14.5%
12:00-15:00	0	0	1	1	33.3%	16.3%
15:00-18:00	0	0	0	0	0%	19.4%
18:00-21:00	0	0	0	0	0%	15.9%
21:00-24:00	0	0	0	0	0%	9%
Unknown	0	0	0	0	N/A	N/A
Total	0	0	3	3	N/A	N/A

Pedestrian Crashes by Control and Pedestrian Action, 2013-2017

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	0	N/A	33.7%
Signalized Intersection: Crossing Against Signal	0	N/A	6.3%
Stop-Controlled Intersection / Crosswalk	0	N/A	7.9%
Other Actions/Uncontrolled Intersection	0	N/A	23.6%
Midblock	0	N/A	28.4%
Other Control Types	0	N/A	0%
Total Known	0	N/A	100%
Unknown/Indeterminate	0	N/A	N/A
Total	0	N/A	N/A

Source:Injury data:NYSDOT/NYSDMV Accident Database
Fatality data:NYCDOT/NYPD Reconciled Fatality Database

Bicycle Crashes by Intersection Control and Bicyclist Action, 2013-2017

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Signalized Intersection: Crossing With Signal	0	N/A	12.6%
Signalized Intersection: Crossing Against Signal	0	N/A	10.1%
Stop-Controlled Intersection / Crosswalk	0	N/A	20.1%
Other Actions/Uncontrolled Intersection	0	N/A	33.1%
Midblock	0	N/A	24.1%
Other Control Types	0	N/A	0%
Total Known	0	N/A	100%
Unknown/Indeterminate	0	N/A	N/A
Total	0	N/A	N/A

Motor Vehicle Crashes by Collision Type, 2013-2017

	Number of Crashes	Percent of Known Crashes	Percent of Known Crashes(Boro)
Left Turn	0	0%	8%
Right Turn	0	0%	2.9%
Rear-End	1	33.3%	25.2%
Right-Angle	1	33.3%	21.3%
Sideswipe (Same Direction)	0	0%	17%
Head-on	1	33.3%	1.6%
Sideswipe (Opposite Direction)	0	0%	1.6%
Other Known	0	0%	22.4%
Total Known	3	100%	100%
Unknown	0	N/A	N/A
Total	3	N/A	N/A

On-Street Parking Supply and Demand Summary

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Jamaica Bus Depot, On-Street Parking Supply
Parking Regulations and Capacity

Date: 10/23/2018
Day: TUESDAY

Douglas Avenue

Between		North Side			South Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
170th Street	168th Street	No Standing Anytime	--	--	No Standing Anytime	--	--
168th Street	Merrick Boulevard	No Posted Regulations	11	11	No Standing Anytime	--	--

Liberty Avenue

Between		North Side			South Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
171st Street	170th Street	Night Reg: NP 3-6 AM MWF	4	3	Night Reg: NP 3-6 AM TuThSat	4	4
170th Street	169th Street	Night Reg: NP 3-6 AM MWF	7	7	Night Reg: NP 3-6 AM TuThSat	4	4
169th Street	168th Place	Night Reg: NP 3-6 AM MWF	4	4	Night Reg: NP 3-6 AM TuThSat	6	6
168th Place	168th Street	Night Reg: NP 3-6 AM MWF	6	5	No Standing Anytime	0	0
168th Street	Merrick Boulevard	Night Reg: NP 3-6 AM MWF	6	6	No Standing Anytime	0	0
Merrick Boulevard	165th Street	Night Reg: NP 3-6 AM MWF	2	2	No Parking Anytime	0	0
165th Street	Guy R Brewer Boulevard	Night Reg: NP 3-6 AM MWF	26	26	Night Reg: NP 3-6 AM TuThSat	29	29
Guy R Brewer Boulevard	160th Street	Night Reg: NP 3-6 AM MWF	17	17	Night Reg: NP 3-6 AM TuThSat	30	30

Tuskegee Airmen Way

Between		North Side			South Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
Merrick Boulevard	165th Street	Night Reg: NP 3-6 AM MWF	5	6	No Standing Anytime (Bus Stop)	0	0
165th Street	164th Street	No Standing Anytime	0	0	No Posted Regulations	14	14
164th Street	Guy R Brewer Boulevard	No Parking Anytime	0	0	No Posted Regulations	6	6
Guy R Brewer Boulevard	Union Hall Street	Night Reg: NP 3-6 AM Th	8	8	Night Reg: NP Mid-3 AM Fri	10	10
Union Hall Street	160th Street	Night Reg: NP 3-6 AM Th	12	12	Night Reg: NP 3-6 AM Fri	8	8

104th Avenue

Between		North Side			South Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
171st Street	170th Street	No Posted Regulations	7	6	No Posted Regulations	7	6
170th Street	169th Street	No Posted Regulations	7	6	No Posted Regulations	9	9
169th Street	168th Place	No Posted Regulations	7	6	No Posted Regulations		
168th Place	Merrick Boulevard	No Posted Regulations	8	7	No Posted Regulations		

104th Road

Between		North Side			South Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
164th Street	164th Place	No Posted Regulations	--	--	No Posted Regulations	6	6

105th Avenue

Between		North Side			South Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
171st Street	170th Street	No Posted Regulations	7	7	No Posted Regulations	6	8
170th Street	169th Street	No Posted Regulations	8	8	No Posted Regulations	7	8
169th Street	Merrick Boulevard	No Posted Regulations	13	13	No Posted Regulations	13	13

106th Avenue

Between		North Side			South Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
169th Street	Merrick Boulevard	No Posted Regulations	8	8	No Posted Regulations	7	7

107th Avenue

Between		North Side			South Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
171st Street	170th Street	No Parking Anytime, No Posted Regulations	3	2	No Posted Regulations	7	6
170th Street	169th Street	No Posted Regulations	8	6	No Posted Regulations	6	6
169th Street	Merrick Boulevard	No Posted Regulations	5	5	No Posted Regulations	6	6
Merrick Boulevard	166th Street	No Standing Anytime, No Posted Regulations	17	17	No Posted Regulations	9	9
166th Street	165th Street	No Posted Regulations	13	13	No Posted Regulations	8	8
164th Place	164th Street	No Posted Regulations	8	8	No Posted Regulations	9	9
164th Street	Guy R Brewer Boulevard	No Posted Regulations	5	4	No Posted Regulations	9	9
Guy R Brewer Boulevard	Union Hall Street	No Posted Regulations	9	9	No Posted Regulations	10	10
Union Hall Street	160th Street	No Posted Regulations	13	13	No Posted Regulations	9	9

108th Avenue

Between		North Side			South Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
Merrick Boulevard	167th Street	No Posted Regulations	14	13	No Parking Anytime	0	6
167th Street	166th Street	No Posted Regulations	--	--	No Posted Regulations	4	3
166th Street	165th Street	No Posted Regulations	10	6	No Posted Regulations	7	6
165th Street	164th Place	No Posted Regulations	4	2	No Posted Regulations	2	2
164th Place	164th Street	No Posted Regulations	8	7	No Posted Regulations, No Standing Anytime	3	3

Hendrickson Place

Between		North Side			South Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
Merrick Boulevard	166th Street	No Posted Regulations	17	17	No Posted Regulations	13	15

Merrick Boulevard

Between		West Side			East Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
93rd Avenue	Douglas Avenue	No Standing Anytime	--	5	Night Reg: NP 3-6 AM Fri; Authorized Vehicles Only	15	15
Douglas Avenue	Liberty Avenue	No Standing Anytime	--	--	Night Reg: NP 3-6 AM Fri	17	17
Liberty Avenue	104th Avenue	No Standing	--	--	No Standing (Bus Stop), Night Reg: NP 3-6 AM Fri	6	6
104th Avenue	105th Avenue	Night Reg: NP 3-6 AM Th	17	17	Night Reg: NP 3-6 AM Fri		
105th Avenue	106th Avenue	Night Reg: NP 3-6 AM Th	--	--	Night Reg: NP 3-6 AM Fri		
106th Avenue	107th Avenue (W)	Night Reg: NP 3-6 AM Th	--	--	Night Reg: NP 3-6 AM Fri		
107th Avenue	Hendrickson Place	Night Reg: NP 3-6 AM Th	10	10	Night Reg: NP 3-6 AM Fri	5	5
Hendrickson Place	108th Avenue	Night Reg: NP 3-6 AM Th	4	4	Night Reg: NP 3-6 AM Fri	5	5

Union Hall Street

Between		West Side			East Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
Tuskegee Airmen Way	107th Avenue	No Posted Regulations	20	20	No Posted Regulations	21	21

Guy R Brewer Boulevard

Between		West Side			East Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
Archer Avenue	Liberty Avenue	No Standing Anytime	--	--	No Standing Anytime	--	--
Liberty Avenue	Tuskegee Airmen Way	Night Reg: NP 3-6 AM Th	24	24	No Standing Anytime	--	--
Tuskegee Airmen Way	107th Avenue	NP 8:30 - 10 AM Mon	18	18	NP 8:30 - 10 AM Tues	20	16
107th Avenue	108th Avenue	NP 8:30 - 10 AM Mon	20	20	NP 8:30 - 10 AM Tues	15	13

164th Street

Between		West Side			East Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
Tuskegee Airmen Way	107th Avenue	No Posted Regulations	30	30	No Posted Regulations	30	29
107th Avenue	108th Avenue	No Posted Regulations	21	21	No Posted Regulations	23	23

164th Place

Between		West Side			East Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
104th Road	107th Avenue	No Posted Regulations	19	19	No Posted Regulations	18	17
107th Avenue	108th Avenue	No Posted Regulations	21	19	No Posted Regulations	20	19

165th Street

Between		West Side			East Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
Archer Avenue	Liberty Avenue	No Standing Anytime	--	--	No Standing Anytime	--	--
Liberty Avenue	Tuskegee Airmen Way	No Posted Regulations	10	10	No Standing Anytime	--	--
Tuskegee Airmen Way	107th Avenue	No Posted Regulations	38	37	No Posted Regulations	29	29
107th Avenue	108th Avenue	No Posted Regulations	28	28	No Posted Regulations	19	19

166th Street

Between		West Side			East Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
107th Avenue	Hendrickson Place	No Posted Regulations	11	10	No Posted Regulations	17	17
Hendrickson Place	108th Avenue	No Posted Regulations	7	7	No Posted Regulations, No Parking Anytime	5	5

168th Place

Between		West Side			East Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
Liberty Avenue	104th Avenue	No Posted Regulations	12	11	No Posted Regulations	16	16

168th Street

Between		West Side			East Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
93rd Avenue	Douglas Avenue	No Standing Anytime; Night Reg: Mid 3 AM MWF	15	15	No Standing Anytime	--	--
Douglas Avenue	Liberty Avenue	Night Reg: Mid - 3 AM MWF	10	10	No Parking Anytime	--	--
Liberty Avenue	Merrick Boulevard	No Posted Regulations	4	4	No Standing Anytime	--	--

169th Street

Between		West Side			East Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
Liberty Avenue	104th Avenue	No Posted Regulations	12	12	No Posted Regulations	14	14
104th Avenue	105th Avenue	No Posted Regulations	11	11	No Posted Regulations	12	12
105th Avenue	106th Avenue	No Posted Regulations	9	9	No Posted Regulations	9	8
106th Avenue	107th Avenue	No Posted Regulations	8	8	No Posted Regulations	6	6

170th Street

Between		West Side			East Side		
			Available	Observed		Available	Observed
From	To	Regulation(s)	Spaces w/o Reg	No-Reg	Regulation(s)	Spaces w/o Reg	No-Reg
Liberty Avenue	104th Avenue	No Posted Regulations	12	11	No Posted Regulations	13	12
105th Avenue	107th Avenue	No Posted Regulations	19	16	No Posted Regulations	17	16
107th Avenue	108th Avenue	No Posted Regulations	18	16	No Posted Regulations	13	12

171st Street

Between		West Side			East Side		
			Available Spaces w/o Reg	Observed Parking		Available Spaces w/o Reg	Observed Parking
From	To	Regulation(s)		No-Reg	Regulation(s)		No-Reg
Liberty Avenue	104th Avenue	No Posted Regulations	14	14	No Posted Regulations	11	11
104th Avenue	105th Avenue	No Posted Regulations	8	8	No Posted Regulations	6	5
105th Avenue	107th Avenue	No Posted Regulations	19	14	No Posted Regulations	17	11
			776	748		667	654

Legal On-Street Spaces (Reg Mon)	0
Legal On-Street Spaces (No Reg Tue)	1443
Observed On-Street (Reg Mon)	0
Observed On-Street (No Reg Tue)	1402
Illegal on Wed	0
Illegal on Mon	0

Signal Timings

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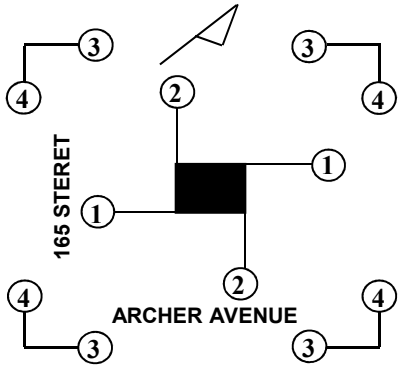
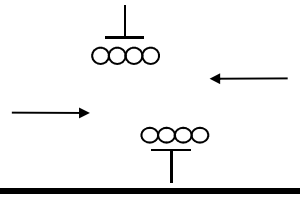
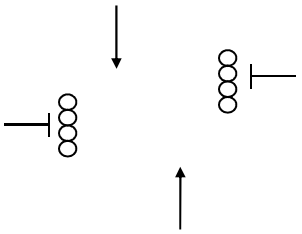
									1	2	3			
	1	2	3	4	5	6	7	8						
	R	R	DW	DW										
	A	A	WK	WK										
	G	G												
L/S #	*1*	*2*	*5*	*6*										
NEMA	*1*	*2*	*1P*	*2P*										
PHASE A	G	R	WK	DW					28	28	28			
SPARE	G	R	WK	DW					2	2	2			
PED CL	G	R	FLDW	DW					11	11	11			
VEH CL	A	R	DW	DW					3	3	3			
VEH CL	R	R	DW	DW					2	2	2			
									46	**46**	**46**			
PHASE B	R	G	DW	WK					17	17	17			
SPARE	R	G	DW	WK					2	2	2			
SPARE	R	G	DW	WK					2	2	2			
SPARE	R	G	DW	WK					2	2	2			
PED CL	R	G	DW	FLDW					16	16	16			
VEH CL	R	A	DW	DW					3	3	3			
VEH CL	R	R	DW	DW					2	2	2			
									44	**44**	**44**			







MON-FRI 6:00-10:15	**AOT**	**MON-FRI 14:30-19:00**			
90 SEC	**90 SEC**	**90 SEC**			
OFFSET					
53	**45**	**88**			

CITY OF NEW YORK

BUREAU OF TRAFFIC OPERATIONS

34-02 Queens Blvd. Long Island City, NY 11101

2/16	TN	MODIFY TIMING / PRIORITY CORRIDOR
DATE	BY	REVISIONS

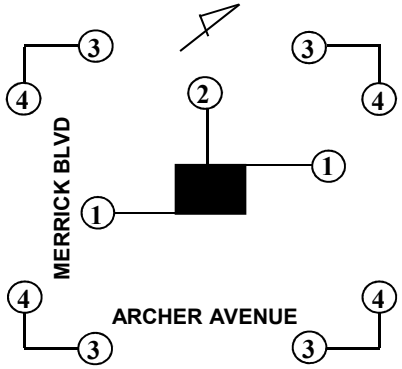
NOTES: NON-ACTUATED
PC = 3.0 FT/SEC
PEDESTRIAN COUNTDOWN
INTERVAL PROGRAM
CABINET TYPE: ASTC-6
CABINET ADDRESS: 6C54

ARCHER AVENUE @ 165 STREET

Prep. T. NGO Date 02/29/16

Appr. _____ Date _____

	1	2	3	4	5	6	7	8
	R	R	DW	DW				
	A	A	WK	WK				
	G	G						
L/S #	*1*	*2*	*5*	*6*				
NEMA	*1*	*2*	*1P*	*2P*				



	1	2	3	4	5	6	7	8	MON-FRI 6:00-10:15	AOT	MON-FRI 14:30-19:00			
									90 SEC	**90 SEC**	**90 SEC**			
PHASE A	G	R	WK	DW					28	28	28			
SPARE	G	R	WK	DW					2	2	2			
PED CL	G	R	FLDW	DW					10	10	10			
VEH CL	A	R	DW	DW					3	3	3			
VEH CL	R	R	DW	DW					2	2	2			
									45	**45**	**45**			
PHASE B	R	G	DW	WK					20	20	20			
SPARE	R	G	DW	WK					2	2	2			
SPARE	R	G	DW	WK					2	2	2			
SPARE	R	G	DW	WK					2	2	2			
PED CL	R	G	DW	FLDW					14	14	14			
VEH CL	R	A	DW	DW					3	3	3			
VEH CL	R	R	DW	DW					2	2	2			
									45	**45**	**45**			

CITY OF NEW YORK

BUREAU OF TRAFFIC OPERATIONS

34-02 Queens Blvd. Long Island City, NY 11101

OFFSET					
45	**45**	**6**			

DATE	BY	REVISIONS
2/16	TN	MODIFY TIMING / PRIORITY CORRIDOR

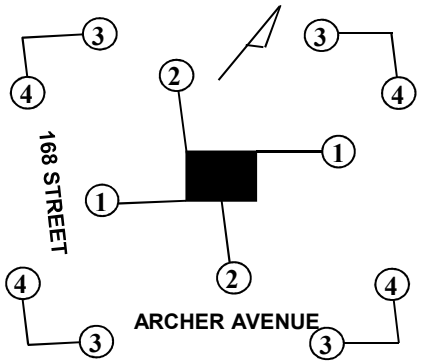
NOTES: NON-ACTUATED
PC = 3.0 FT/SEC
PEDESTRIAN COUNTDOWN
INTERVAL PROGRAM
CABINET TYPE: ASTC-6
CABINET ADDRESS: 6C53

ARCHER AVENUE @ MERRICK BLVD

Prep. T. NGO Date 02/29/16

Appr. Date

	1	2	3	4	5	6	7	8
	R	R	DW	DW				
	A	A	WK	WK				
	G	G						
L/S #	*1*	*2*	*5*	*6*				
NEMA	*1*	*2*	*1P*	*2P*				



PHASE A	G	R	WK	DW					13
SPARE	G	R	WK	DW					2
PED CL	G	R	FLDW	DW					11
VEH CL	A	R	DW	DW					3
VEH CL	R	R	DW	DW					2
									31
PHASE B	R	G	DW	WK					3
SPARE	R	G	DW	WK					2
SPARE	R	G	DW	WK					2
SPARE	R	G	DW	WK					2
PED CL	R	G	DW	FLDW					15
VEH CL	R	A	DW	DW					3
VEH CL	R	R	DW	DW					2
									29

AAT					
60 SEC					
OFFSET					
30					

CITY OF NEW YORK

BUREAU OF TRAFFIC OPERATIONS

34-02 Queens Blvd. Long Island City, NY 11101

DATE	BY	REVISIONS

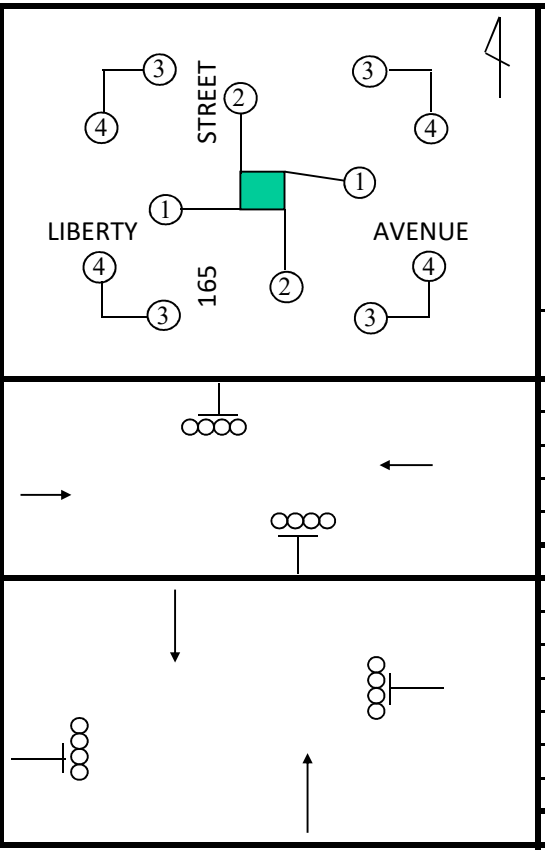
NOTES: NON-ACTUATED
PC = 3.0 FT/SEC

INTERVAL PROGRAM
CABINET TYPE: ASTC-6
CABINET ADDRESS: 6C55

ARCHER AVENUE @ 168 STREET

Prep. JHK Eng. Date 02/27/15
Appr. _____ Date _____

	1	2	3	4	5	6	7	8
	R	R	DW	DW				
	A	A	WK	WK				
	G	G						
L/S#	1	2	5	6				
NEMA	1	2	1P	2P				
PHASE A	G	R	WK	DW				
SPARE	G	R	WK	DW				
PED CL	G	R	FLDW	DW				
VEH CL	A	R	DW	DW				
VEH CL	R	R	DW	DW				
PHASE B	R	G	DW	WK				
SPARE	R	G	DW	WK				
SPARE	R	G	DW	WK				
PED CL	R	G	DW	FLDW				
PED CL	R	G	DW	FLDW				
VEH CL	R	A	DW	DW				
VEH CL	R	R	DW	DW				



AT ALL TIMES			
60 SEC			
9			
2			
12			
3			
2			
28			
3			
2			
2			
2			
18			
3			
2			
32			

CITY OF NEW YORK
BUREAU OF TRAFFIC OPERATIONS
34-02 Queens Blvd. Long Island City, NY 11101

OFFSET			
30			

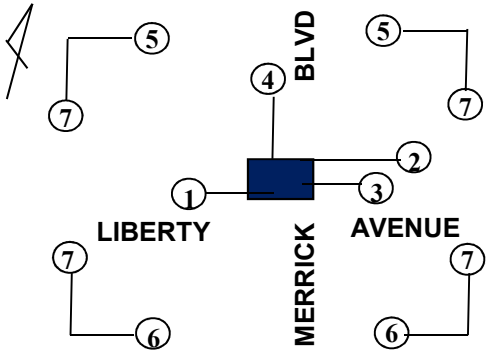
10-17	MA	UPGRADE FIRMWARE TO 868
DATE	BY	REVISIONS

NOTES: NON ACTUATED
PC: 3.5 FT/ SEC
CABINET TYPE: ASTC-6
PEDESTRIAN COUNTDOWN
CABINET ADDRESS: 6C68

LIBERTY AVENUE @ 165 STREET

Prep M.ABDU Date 10-11-17
Appr. Date

	1	2	3	4	5	6	7
	R	R	R	R	DW	DW	DW
	A	A	A	A	WK	WK	WK
	G	G	G	G			
			G←				
L/S #	**1**	**2**	**3**	**4**	**5**	**6**	**5Y6Y**
NEMA	***1***	***OL1***	***2***	***3***	***1P***	***1P***	***3P***
		(1+2)					
PHASE A	G	G	G	R	WK	WK	DW
SPARE	G	G	G	R	WK	WK	DW
PED CL	G	G	G	R	WK	**FLDW**	DW
VEH CL	A	G	G	R	**FLDW**	DW	DW
VEH CL	R	G	G	R	**FLDW**	DW	DW
PHASE B	R	G	G/G←	R	**FLDW**	DW	DW
VEH CL	R	A	A	R	DW	DW	DW
VEH CL	R	R	R	R	DW	DW	DW
PHASE C	R	R	R	G	DW	DW	WK
PED CL	R	R	R	**G**	DW	DW	**FLDW**
VEH CL	R	R	R	A	DW	DW	DW
VEH CL	R	R	R	R	DW	DW	DW



	1	2	3
	06:30-08:30 MON-FRI	**AOT**	**14:30-17:30 MON-FRI**
	90 SEC	**90 SEC**	**90 SEC**
	16	16	16
	2	2	2
	12	12	12
	3	3	3
	2	2	2
	35	**35**	**35**
	6	6	6
	3	3	3
	2	2	2
	11	11	11
	12	12	12
	27	27	27
	3	3	3
	2	2	2
	44	**44**	**44**
OFFSET	**71**	**29**	**44**

CITY OF NEW YORK
BUREAU OF TRAFFIC OPERATIONS
34-02 Queens Blvd. Long Island City, NY 11101

Channel "7" See I/O Mapping
Don't use default I/O Mapping
Use "ALT" I/O Mapping

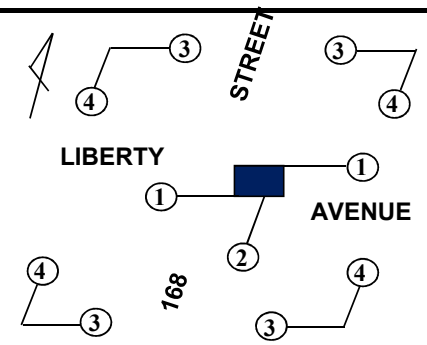
06-14	GPI	Retiming Project (Overnight 25 MPH)/868
DATE	BY	REVISIONS

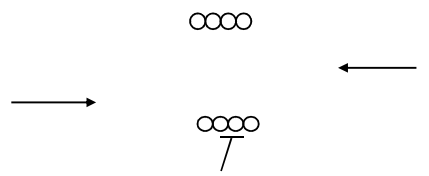
NOTES: NON ACTUATED
PC = 3.0 FT/SEC
CONTROLLER # 1
"PEDESTRIAN COUNTDOWN"
Cabinet Type: ASTC-6
Cabinet Address: 6C67

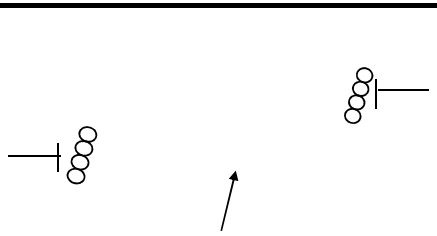
LIBERTY AVENUE @ MERRICK BLVD

Prep R. Abdalla Date 06/03/14
Appr. Date

	1	2	3	4	5	6	7	
	R	R	DW	DW				
	A	A	WK	WK				
	G	G						
L/S #	1	2	5	6				
NEMA	1	2	1P	2P				
PHASE A	G	R	WK	DW				
SPARE	G	R	WK	DW				
PED CL	G	R	**FLDW**	DW				
VEH CL	A	R	DW	DW				
VEH CL	R	R	DW	DW				
PHASE B	R	G	DW	WK				
SPARE	R	G	DW	WK				
SPARE	R	G	DW	WK				
SPARE	R	G	DW	WK				
PED CL	R	G	DW	**FLDW**				
VEH CL	R	A	DW	DW				
VEH CL	R	R	DW	DW				







	1	2	3
	06:30-08:30 MON-FRI	AOT	14:30-17:30 MON-FRI
	90 SEC	**90 SEC**	**90 SEC**
PHASE A	27	27	27
SPARE	2	2	2
PED CL	11	11	11
VEH CL	3	3	3
VEH CL	2	2	2
	45	**45**	**45**
PHASE B	3	3	3
SPARE	2	2	2
SPARE	2	2	2
SPARE	2	2	2
PED CL	31	31	31
VEH CL	3	3	3
VEH CL	2	2	2
	45	**45**	**45**
OFFSET			
	72	**30**	**45**

CITY OF NEW YORK
BUREAU OF TRAFFIC OPERATIONS
34-02 Queens Blvd. Long Island City, NY 11101

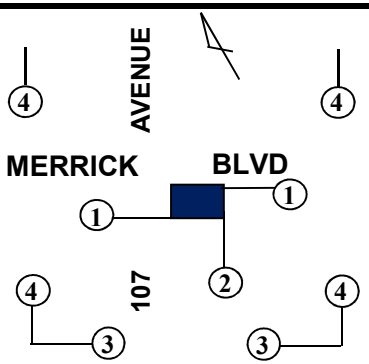
05/14	GPI	Retiming Project (Overnight 25Mph) & Update to 868
DATE	BY	REVISIONS

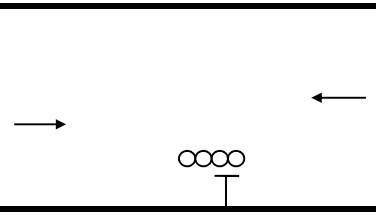
NOTES: NON ACTUATED
PC = 3.0 FT/SEC
Cabinet Type: ASTC-6
Cabinet Address: 6C8A
INTERVAL PROGRAM

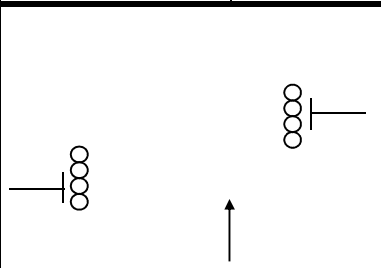
LIBERTY AVENUE @ 168 STREET

Prep R.ABDALLA Date 05/23/14
Appr. Date

										1	2	3	4
	1	2	3	4	5	6	7	8		06:30-08:30 MON-FRI	08:30-14:30 17:30-22:00 MON-FRI 08:00-21:00 WEEKEND	14:30-17:30 MON-FRI	22:00-06:30 MON-FRI 21:00-08:00 WEEKEND
	R	R	DW	DW									
	A	A	WK	WK									
	G	G											
L/S #	1	2	5	6									
NEMA	1	2	1P	2P									
										90 sec	**90 sec**	**90 sec**	**90 sec**
PHASE A	G	R	WK	DW						40	30	40	29
SPARE	G	R	WK	DW						2	2	2	2
PED CL	G	R	**FLDW**	DW						9	9	9	9
VEH CL	A	R	DW	DW						3	3	3	3
VEH CL	R	R	DW	DW						2	2	2	2
										56	**46**	**56**	**45**
PHASE B	R	G	DW	WK						3	13	3	14
SPARE	R	G	DW	WK						2	2	2	2
SPARE	R	G	DW	WK						2	2	2	2
SPARE	R	G	DW	WK						2	2	2	2
PED CL	R	G	DW	**FLDW**						20	20	20	20
VEH CL	R	A	DW	DW						3	3	3	3
VEH CL	R	R	DW	DW						2	2	2	2
										34	**44**	**34**	**45**







CITY OF NEW YORK
BUREAU OF TRAFFIC OPERATIONS
34-02 Queens Blvd. Long Island City, NY 11101

05/14	GPI	RETIMING PROJECT / OVENIGHT 25 MPH
DATE	BY	REVISIONS

NOTES: NON ACTUATED
PEDESTRIAN COUNTDOWN
PC = 3.0 FT/SEC
Cabinet Type: ASTC-6
INTERVAL PROGRAM
Cabinet Address: 6C73

OFFSET			
78	**13**	**75**	**19**

MERRICK BLVD @ 107 AVENUE

Prep **R.WASEF** Date **05/22/14**
Appr. _____ Date _____

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2025 Build Network

Alternative A

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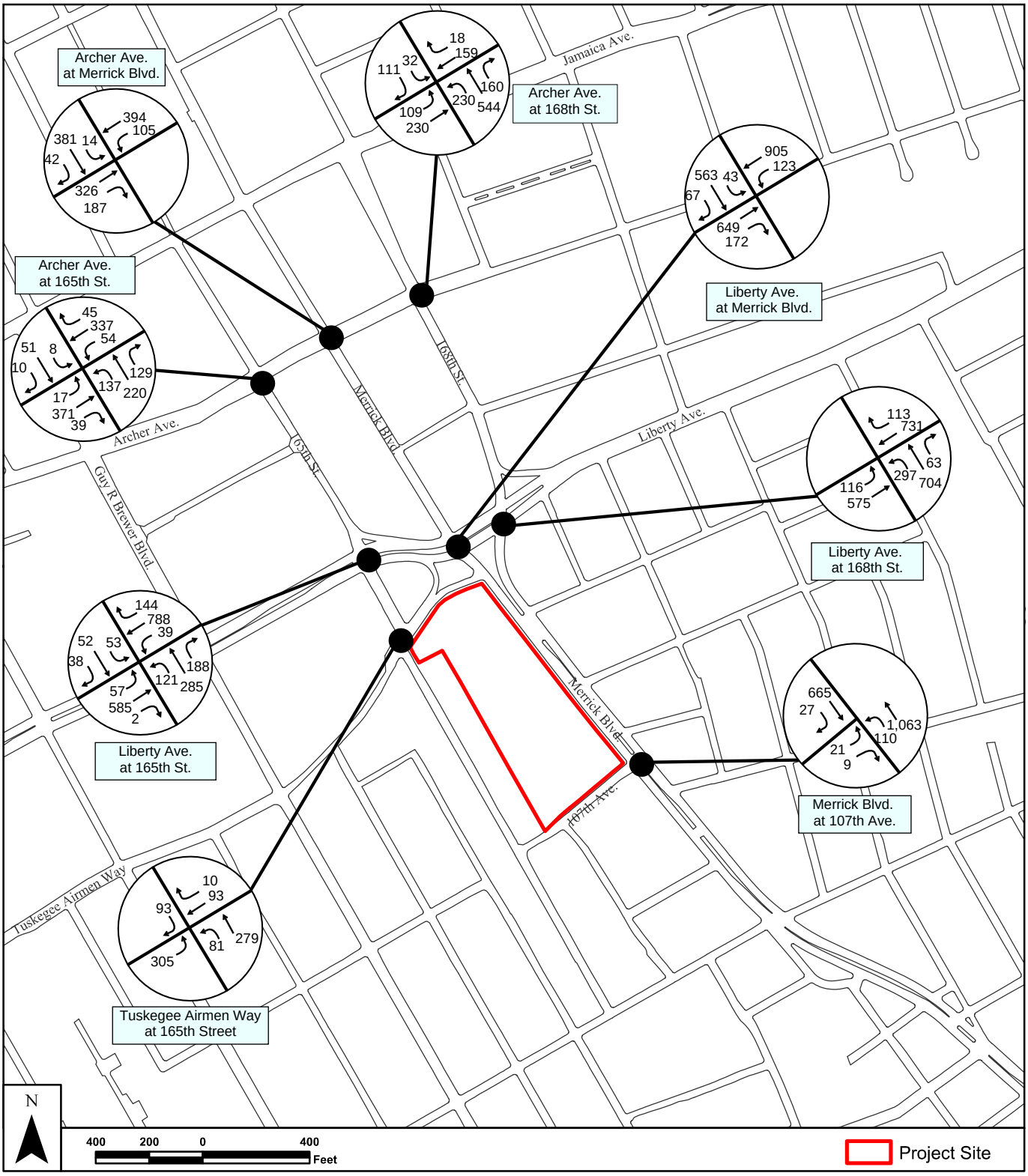
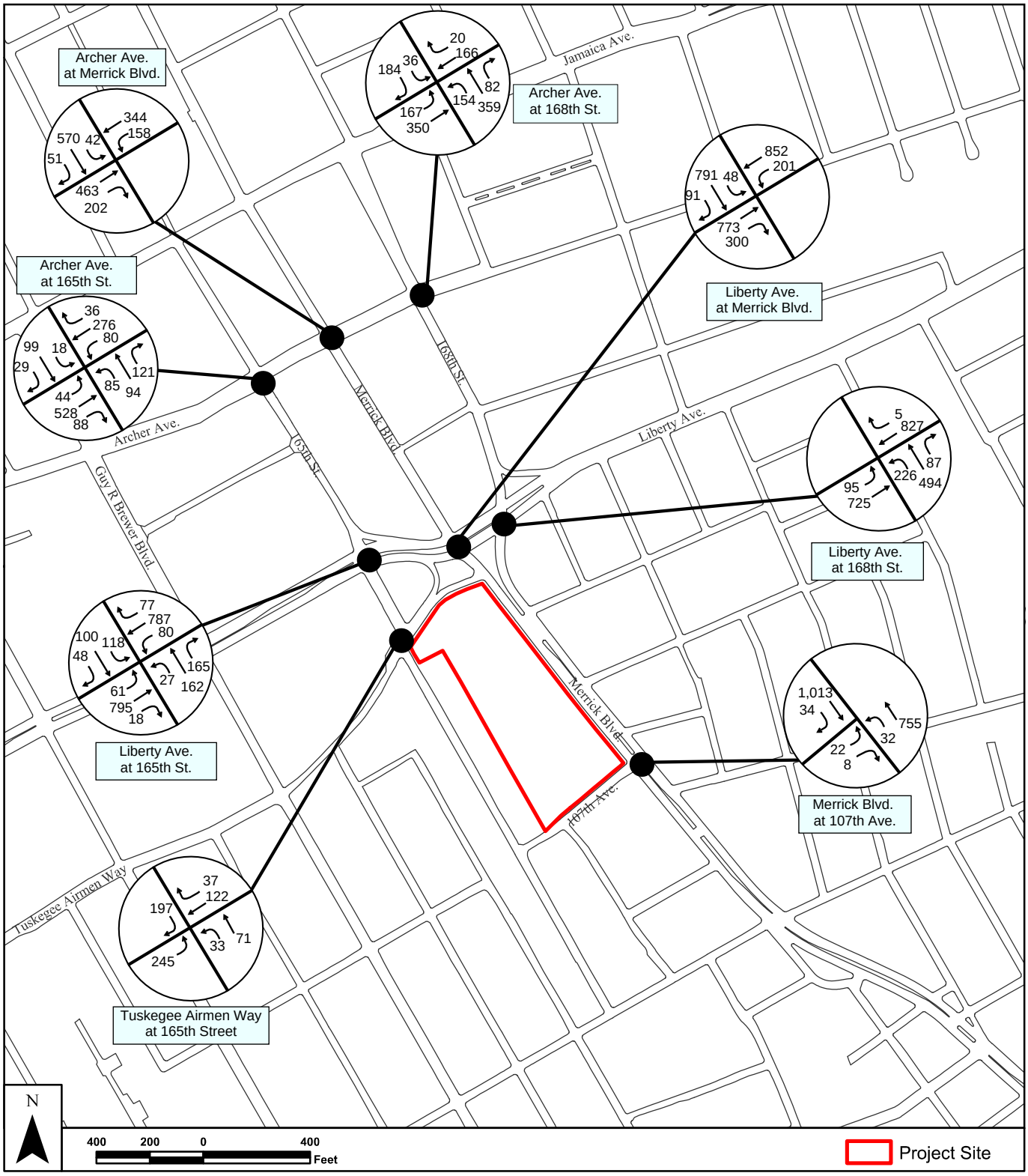


Source: STV Incorporated, 2019.

Figure A-1

FUTURE WITH THE PROPOSED ACTION CONDITION TRAFFIC VOLUME
AM PEAK HOUR (Alternative A)



Source: STV Incorporated, 2019.

Figure A-2

FUTURE WITH THE PROPOSED ACTION CONDITION TRAFFIC VOLUME
PM PEAK HOUR (Alternative A)

2025 Build Network

Alternative B

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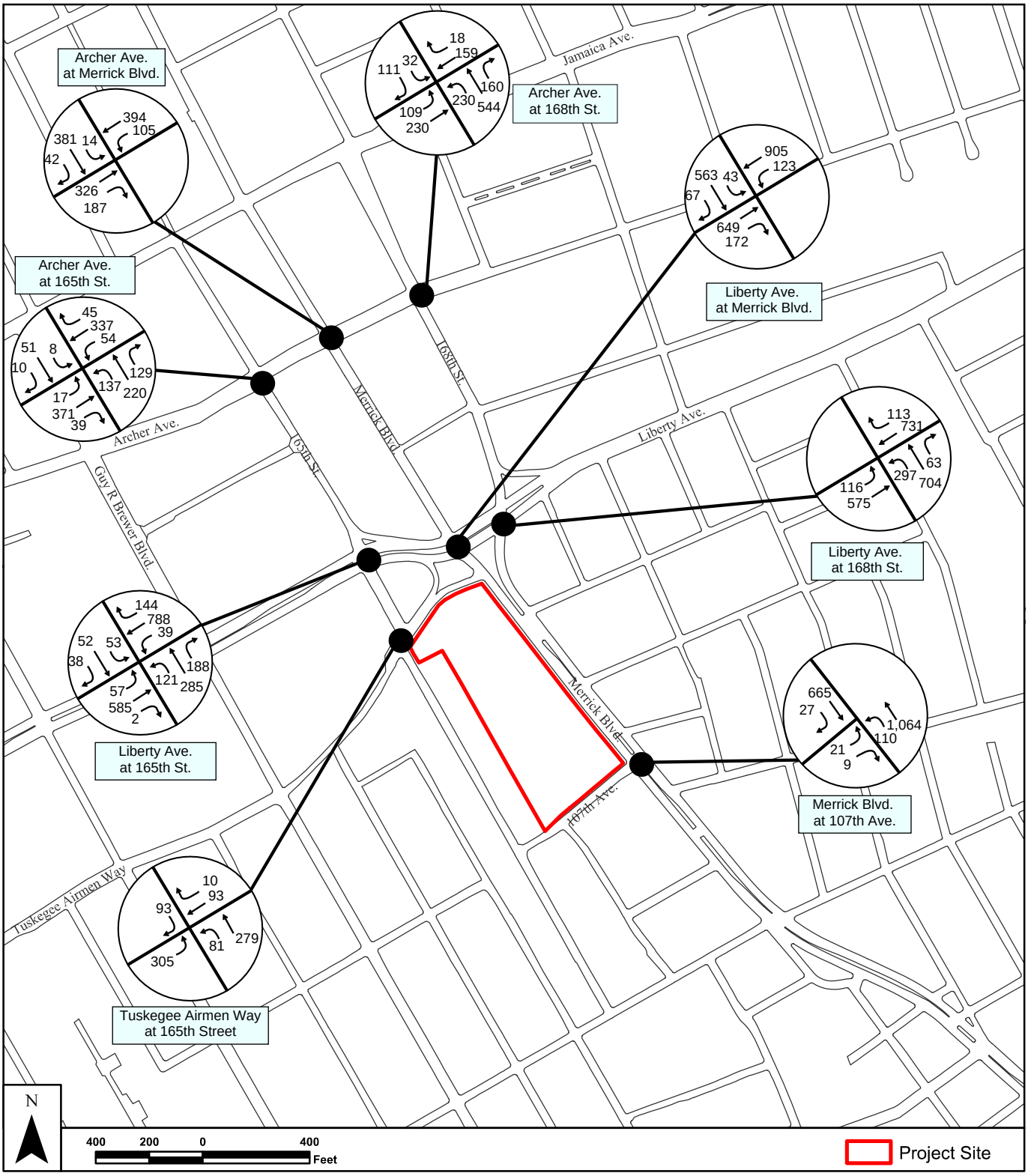
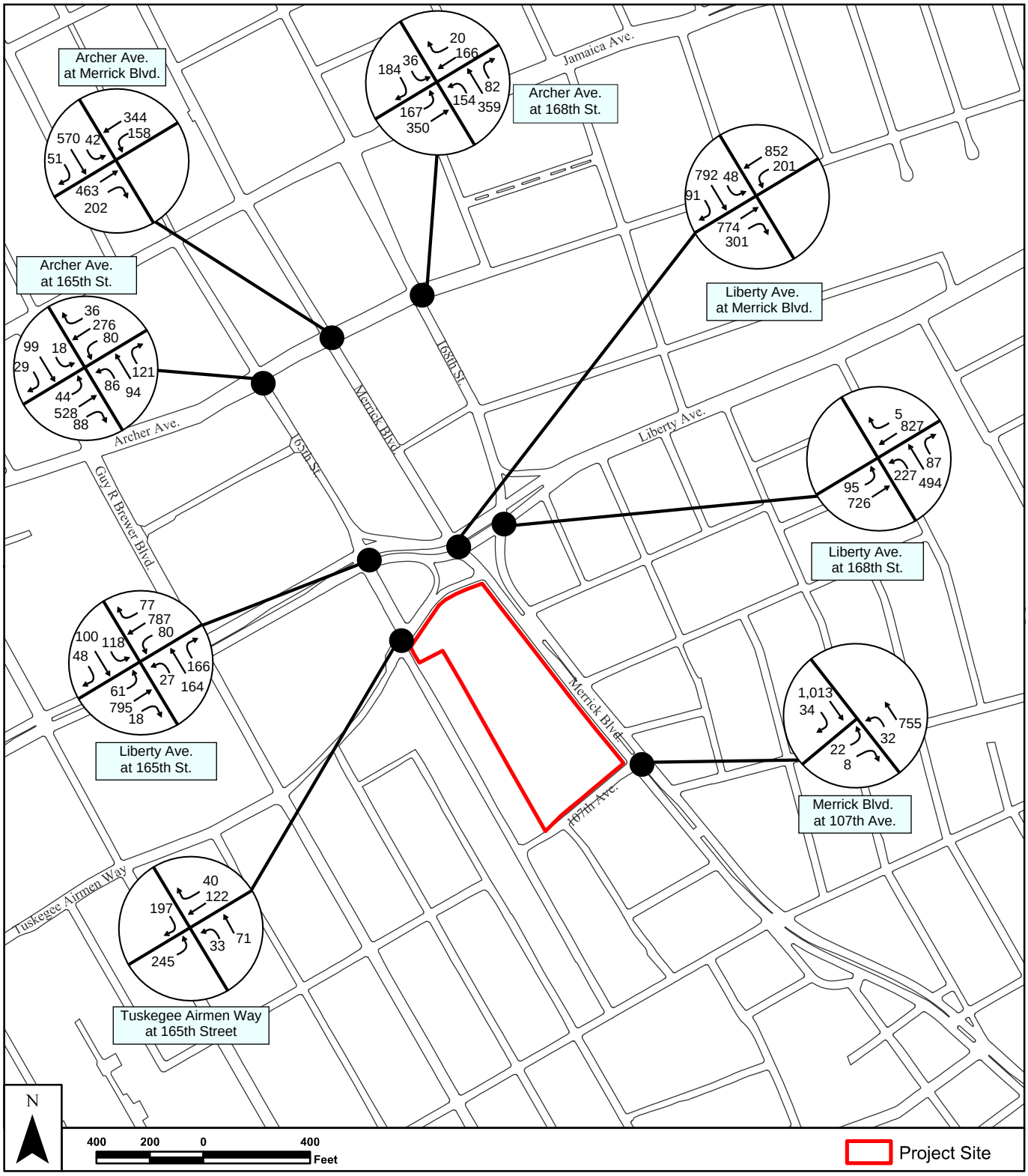


Source: STV Incorporated, 2019.

Figure A-3

FUTURE WITH THE PROPOSED ACTION CONDITION TRAFFIC VOLUME
AM PEAK HOUR (Alternative B)



Source: STV Incorporated, 2019.

Figure A-4

FUTURE WITH THE PROPOSED ACTION CONDITION TRAFFIC VOLUME
PM PEAK HOUR (Alternative B)

Synchro Analysis

AM Existing 2018

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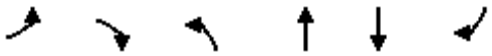
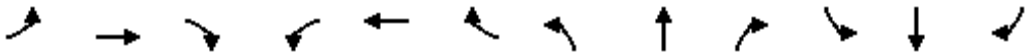


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	23	10	118	1000	640	29
Future Volume (vph)	23	10	118	1000	640	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.96		1.00	1.00	0.99	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1421		1477	2998	2720	
Flt Permitted	0.97		0.31	1.00	1.00	
Satd. Flow (perm)	1421		478	2998	2720	
Peak-hour factor, PHF	0.81	0.81	0.94	0.94	0.85	0.85
Adj. Flow (vph)	28	12	126	1064	753	34
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	40	0	126	1064	787	0
Heavy Vehicles (%)	17%	17%	10%	10%	16%	16%
Parking (#/hr)	3	3		2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	457		270	1698	1541	
v/s Ratio Prot	c0.03			c0.35	0.29	
v/s Ratio Perm			0.26			
v/c Ratio	0.09		0.47	0.63	0.51	
Uniform Delay, d1	21.3		11.5	13.1	11.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.4		5.7	1.8	1.2	
Delay (s)	21.6		17.2	14.9	13.1	
Level of Service	C		B	B	B	
Approach Delay (s)	21.6			15.1	13.1	
Approach LOS	C			B	B	

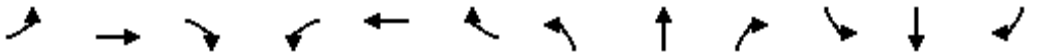
Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	121.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



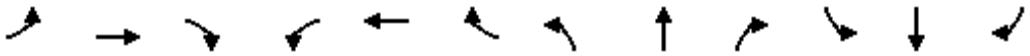
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	629	167	114	878	0	0	0	0	41	529	65
Future Volume (vph)	0	629	167	114	878	0	0	0	0	41	529	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.98	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3172	1419	1612	3249						2814	
Flt Permitted		1.00	1.00	0.26	1.00						1.00	
Satd. Flow (perm)		3172	1419	444	3249						2814	
Peak-hour factor, PHF	0.88	0.88	0.88	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85
Adj. Flow (vph)	0	715	190	121	934	0	0	0	0	48	622	76
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	715	190	121	934	0	0	0	0	0	746	0
Heavy Vehicles (%)	10%	10%	10%	12%	12%	12%	2%	2%	2%	13%	13%	13%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2					3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1057	473	280	1480						1219	
v/s Ratio Prot		0.23		0.03	c0.29							
v/s Ratio Perm			0.13	0.17							0.27	
v/c Ratio		0.68	0.40	0.43	0.63						0.61	
Uniform Delay, d1		25.8	23.1	24.5	18.7						19.7	
Progression Factor		1.00	1.00	1.32	1.34						1.00	
Incremental Delay, d2		3.5	2.5	3.3	1.4						2.3	
Delay (s)		29.3	25.6	35.6	26.6						22.0	
Level of Service		C	C	D	C						C	
Approach Delay (s)		28.5			27.6			0.0			22.0	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



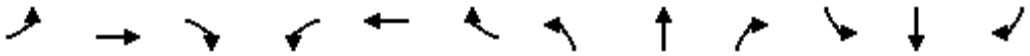
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	567	2	38	765	139	117	271	183	51	49	37
Future Volume (vph)	55	567	2	38	765	139	117	271	183	51	49	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.98			1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1572	3064		1491	4005			1774	1531		1787	
Flt Permitted	0.25	1.00		0.33	1.00			0.85	1.00		0.77	
Satd. Flow (perm)	410	3064		515	4005			1538	1531		1408	
Peak-hour factor, PHF	0.85	0.85	0.85	0.97	0.97	0.97	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	65	667	2	39	789	143	136	315	213	54	52	39
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	65	669	0	39	932	0	0	451	213	0	145	0
Heavy Vehicles (%)	11%	11%	11%	13%	13%	13%	2%	2%	2%	14%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	157	1174		197	1535			692	688		633	
v/s Ratio Prot		0.22			c0.23							
v/s Ratio Perm	0.16			0.08				c0.29	0.14		0.10	
v/c Ratio	0.41	0.57		0.20	0.61			0.65	0.31		0.23	
Uniform Delay, d1	13.6	14.6		12.3	14.9			12.8	10.5		10.1	
Progression Factor	0.63	0.63		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	6.5	1.7		2.2	1.8			4.7	1.2		0.8	
Delay (s)	15.1	10.9		14.6	16.7			17.6	11.7		11.0	
Level of Service	B	B		B	B			B	B		B	
Approach Delay (s)		11.3			16.6			15.7			11.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



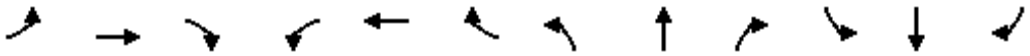
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	558	0	0	708	110	284	659	61	0	0	0
Future Volume (vph)	113	558	0	0	708	110	284	659	61	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			0.98			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1546	3533			3057			2830				
Flt Permitted	0.22	1.00			1.00			0.99				
Satd. Flow (perm)	356	3533			3057			2830				
Peak-hour factor, PHF	0.89	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	127	627	0	0	770	120	309	716	66	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	127	627	0	0	890	0	0	1091	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	13%	13%	13%	10%	10%	10%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	158	1570			1358			1257				
v/s Ratio Prot		0.18			0.29							
v/s Ratio Perm	c0.36							0.39				
v/c Ratio	0.80	0.40			0.66			0.87				
Uniform Delay, d1	21.6	16.9			19.6			22.6				
Progression Factor	1.94	2.09			1.00			1.00				
Incremental Delay, d2	26.3	0.6			2.5			8.3				
Delay (s)	68.3	35.9			22.1			30.9				
Level of Service	E	D			C			C				
Approach Delay (s)		41.3			22.1			30.9			0.0	
Approach LOS		D			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



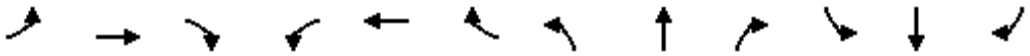
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	348	37	51	319	43	128	213	125	8	49	10
Future Volume (vph)	17	348	37	51	319	43	128	213	125	8	49	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.99			0.98			0.96			0.98	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1419	1472			2918			1559			1415	
Flt Permitted	0.44	1.00			0.82			0.88			0.94	
Satd. Flow (perm)	655	1472			2399			1395			1341	
Peak-hour factor, PHF	0.88	0.88	0.88	0.85	0.85	0.85	0.94	0.94	0.94	0.81	0.81	0.81
Adj. Flow (vph)	19	395	42	60	375	51	136	227	133	10	60	12
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	19	437	0	0	486	0	0	496	0	0	82	0
Heavy Vehicles (%)	23%	23%	23%	17%	17%	17%	12%	12%	12%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)											3	3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	298	670			1092			604			581	
v/s Ratio Prot		c0.30										
v/s Ratio Perm	0.03				0.20			c0.36			0.06	
v/c Ratio	0.06	0.65			0.45			0.82			0.14	
Uniform Delay, d1	13.7	19.0			16.7			22.4			15.4	
Progression Factor	1.00	1.00			2.05			1.00			1.00	
Incremental Delay, d2	0.4	4.9			1.2			11.9			0.5	
Delay (s)	14.1	23.9			35.4			34.4			15.9	
Level of Service	B	C			D			C			B	
Approach Delay (s)		23.5			35.4			34.4			15.9	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	217	0	0	151	17	210	517	155	29	0	101
Future Volume (vph)	101	217	0	0	151	17	210	517	155	29	0	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.90	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2632			3221		1479	3143			1602	
Flt Permitted		0.80			1.00		0.70	1.00			0.80	
Satd. Flow (perm)		2127			3221		1096	3143			1293	
Peak-hour factor, PHF	0.90	0.90	0.90	0.87	0.87	0.87	0.95	0.95	0.95	0.81	0.81	0.81
Adj. Flow (vph)	112	241	0	0	174	20	221	544	163	36	0	125
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	353	0	0	194	0	221	707	0	0	161	0
Heavy Vehicles (%)	18%	18%	18%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		921			1395		438	1257			517	
v/s Ratio Prot					0.06			c0.22				
v/s Ratio Perm		c0.17					0.20				0.12	
v/c Ratio		0.38			0.14		0.50	0.56			0.31	
Uniform Delay, d1		11.6			10.3		13.5	13.9			12.3	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		1.2			0.2		4.1	1.8			1.6	
Delay (s)		12.8			10.5		17.6	15.8			13.9	
Level of Service		B			B		B	B			B	
Approach Delay (s)		12.8			10.5			16.2			13.9	
Approach LOS		B			B			B			B	

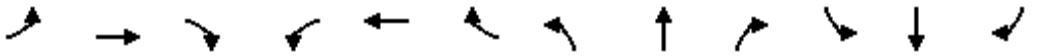
Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	304	176	89	373	0	0	0	0	14	370	40
Future Volume (vph)	0	304	176	89	373	0	0	0	0	14	370	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.94			1.00						0.99	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		2698			2980						2655	
Flt Permitted		1.00			0.73						1.00	
Satd. Flow (perm)		2698			2190						2655	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.92	0.92	0.92	0.86	0.86	0.86
Adj. Flow (vph)	0	345	200	99	414	0	0	0	0	16	430	47
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	545	0	0	513	0	0	0	0	0	493	0
Heavy Vehicles (%)	18%	18%	18%	12%	12%	12%	2%	2%	2%	18%	18%	18%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1199			973						1180	
v/s Ratio Prot		0.20										
v/s Ratio Perm					c0.23						0.19	
v/c Ratio		0.45			0.53						0.42	
Uniform Delay, d1		17.4			18.1						17.1	
Progression Factor		1.13			1.00						1.00	
Incremental Delay, d2		0.9			2.0						1.1	
Delay (s)		20.5			20.2						18.1	
Level of Service		C			C						B	
Approach Delay (s)		20.5			20.2			0.0			18.1	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	296	0	0	0	90	5	79	270	0	0	0	89
Future Volume (Veh/h)	296	0	0	0	90	5	79	270	0	0	0	89
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.81	0.81	0.81	0.83	0.83	0.83	0.84	0.84	0.84
Hourly flow rate (vph)	318	0	0	0	111	6	95	325	0	0	0	106
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	576	515	0	568	621	325	106			325		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	576	515	0	568	621	325	106			325		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.2			2.3		
p0 queue free %	0	100	100	100	70	99	94			100		
cM capacity (veh/h)	308	430	1076	405	371	705	1479			1181		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	318	117	420	106
Volume Left	318	0	95	0
Volume Right	0	6	0	106
cSH	308	381	1479	1700
Volume to Capacity	1.03	0.31	0.06	0.06
Queue Length 95th (ft)	289	32	5	0
Control Delay (s)	98.3	18.6	2.2	0.0
Lane LOS	F	C	A	
Approach Delay (s)	98.3	18.6	2.2	0.0
Approach LOS	F	C		

Intersection Summary				
Average Delay	35.7			
Intersection Capacity Utilization	48.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Synchro Analysis

PM Existing 2018

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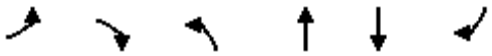
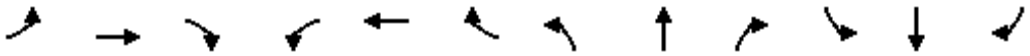


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	10	39	688	973	41
Future Volume (vph)	25	10	39	688	973	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.96		1.00	1.00	0.99	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1696		1291	2944	2869	
Flt Permitted	0.97		0.19	1.00	1.00	
Satd. Flow (perm)	1696		258	2944	2869	
Peak-hour factor, PHF	0.81	0.81	0.98	0.98	0.92	0.92
Adj. Flow (vph)	31	12	40	702	1058	45
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	43	0	40	702	1103	0
Heavy Vehicles (%)	11%	11%	12%	12%	10%	10%
Parking (#/hr)		3	2	2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	546		146	1668	1625	
v/s Ratio Prot	c0.03			0.24	c0.38	
v/s Ratio Perm			0.16			
v/c Ratio	0.08		0.27	0.42	0.68	
Uniform Delay, d1	21.2		10.0	11.1	13.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		4.6	0.8	2.3	
Delay (s)	21.5		14.6	11.9	16.0	
Level of Service	C		B	B	B	
Approach Delay (s)	21.5			12.0	16.0	
Approach LOS	C			B	B	

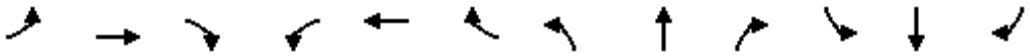
Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



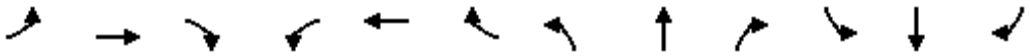
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	749	289	192	827	0	0	0	0	46	753	88
Future Volume (vph)	0	749	289	192	827	0	0	0	0	46	753	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.99	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3231	1446	1671	3369						2947	
Flt Permitted		1.00	1.00	0.20	1.00						1.00	
Satd. Flow (perm)		3231	1446	360	3369						2947	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	823	318	206	889	0	0	0	0	51	837	98
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	823	318	206	889	0	0	0	0	0	986	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	2%	2%	2%	8%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2	2				3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1077	482	251	1534						1277	
v/s Ratio Prot		0.25		c0.05	0.26							
v/s Ratio Perm			0.22	c0.32							0.33	
v/c Ratio		0.76	0.66	0.82	0.58						0.77	
Uniform Delay, d1		26.8	25.6	29.9	18.1						21.7	
Progression Factor		1.00	1.00	0.59	0.45						1.00	
Incremental Delay, d2		5.2	6.9	20.9	1.3						4.6	
Delay (s)		32.0	32.6	38.6	9.5						26.3	
Level of Service		C	C	D	A						C	
Approach Delay (s)		32.2			15.0			0.0			26.3	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



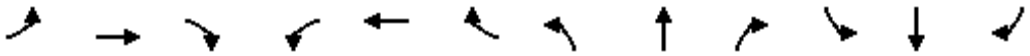
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	771	18	77	763	74	25	130	157	115	96	47
Future Volume (vph)	59	771	18	77	763	74	25	130	157	115	96	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1601	3111		1560	4232			1786	1531		1938	
Flt Permitted	0.25	1.00		0.23	1.00			0.92	1.00		0.79	
Satd. Flow (perm)	426	3111		376	4232			1662	1531		1557	
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.90	0.90	0.90	0.82	0.82	0.82
Adj. Flow (vph)	63	829	19	85	838	81	28	144	174	140	117	57
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	63	848	0	85	919	0	0	172	174	0	314	0
Heavy Vehicles (%)	9%	9%	9%	8%	8%	8%	2%	2%	2%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	163	1192		144	1622			747	688		700	
v/s Ratio Prot		c0.27			0.22							
v/s Ratio Perm	0.15			0.23				0.10	0.11		c0.20	
v/c Ratio	0.39	0.71		0.59	0.57			0.23	0.25		0.45	
Uniform Delay, d1	13.4	15.7		14.7	14.6			10.1	10.2		11.4	
Progression Factor	1.48	1.38		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	5.2	2.8		16.5	1.4			0.7	0.9		2.1	
Delay (s)	25.0	24.5		31.3	16.0			10.8	11.1		13.4	
Level of Service	C	C		C	B			B	B		B	
Approach Delay (s)		24.5			17.3			11.0			13.4	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



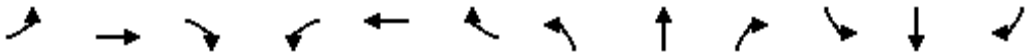
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	703	0	0	802	5	218	459	84	0	0	0
Future Volume (vph)	92	703	0	0	802	5	218	459	84	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			1.00			0.98				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1589	3633			3323			2758				
Flt Permitted	0.23	1.00			1.00			0.99				
Satd. Flow (perm)	383	3633			3323			2758				
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	100	764	0	0	862	5	232	488	89	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	100	764	0	0	867	0	0	809	0	0	0	0
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	12%	12%	12%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	170	1614			1476			1225				
v/s Ratio Prot		0.21			0.26							
v/s Ratio Perm	c0.26							0.29				
v/c Ratio	0.59	0.47			0.59			0.66				
Uniform Delay, d1	18.8	17.6			18.8			19.7				
Progression Factor	0.18	0.08			1.00			1.00				
Incremental Delay, d2	9.0	0.6			1.7			2.8				
Delay (s)	12.4	2.0			20.5			22.5				
Level of Service	B	A			C			C				
Approach Delay (s)		3.2			20.5			22.5			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



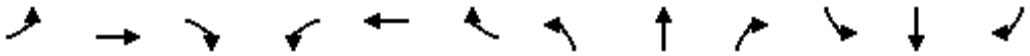
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	497	85	76	274	34	56	90	118	17	96	27
Future Volume (vph)	42	497	85	76	274	34	56	90	118	17	96	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.98			0.99			0.94			0.97	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1517	1562			2965			1581			1393	
Flt Permitted	0.48	1.00			0.63			0.91			0.95	
Satd. Flow (perm)	770	1562			1876			1447			1328	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.83	0.83	0.83	0.92	0.92	0.92
Adj. Flow (vph)	44	523	89	84	301	37	67	108	142	18	104	29
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	44	612	0	0	422	0	0	317	0	0	151	0
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	8%	8%	8%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)										3	3	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	350	711			854			627			575	
v/s Ratio Prot		c0.39										
v/s Ratio Perm	0.06				0.22			c0.22			0.11	
v/c Ratio	0.13	0.86			0.49			0.51			0.26	
Uniform Delay, d1	14.1	21.9			17.2			18.5			16.3	
Progression Factor	1.00	1.00			1.18			1.00			1.00	
Incremental Delay, d2	0.7	13.0			1.6			2.9			1.1	
Delay (s)	14.9	34.9			21.9			21.4			17.4	
Level of Service	B	C			C			C			B	
Approach Delay (s)		33.6			21.9			21.4			17.4	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	105.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	333	0	0	157	18	159	318	79	33	0	166
Future Volume (vph)	148	333	0	0	157	18	159	318	79	33	0	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.89	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2725			3284		1439	3073			1593	
Flt Permitted		0.78			1.00		0.63	1.00			0.88	
Satd. Flow (perm)		2167			3284		949	3073			1416	
Peak-hour factor, PHF	0.97	0.97	0.97	0.86	0.86	0.86	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	153	343	0	0	183	21	183	366	91	38	0	191
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	496	0	0	204	0	183	457	0	0	229	0
Heavy Vehicles (%)	14%	14%	14%	1%	1%	1%	11%	11%	11%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		939			1423		379	1229			566	
v/s Ratio Prot					0.06			0.15				
v/s Ratio Perm		c0.23					c0.19				0.16	
v/c Ratio		0.53			0.14		0.48	0.37			0.40	
Uniform Delay, d1		12.5			10.3		13.4	12.7			12.9	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		2.1			0.2		4.4	0.9			2.1	
Delay (s)		14.6			10.5		17.7	13.6			15.0	
Level of Service		B			B		B	B			B	
Approach Delay (s)		14.6			10.5			14.7			15.0	
Approach LOS		B			B			B			B	

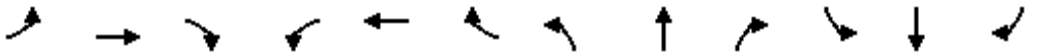
Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	440	191	144	337	0	0	0	0	41	552	48
Future Volume (vph)	0	440	191	144	337	0	0	0	0	41	552	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		2846			3018						2906	
Flt Permitted		1.00			0.60						1.00	
Satd. Flow (perm)		2846			1824						2906	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	0	468	203	157	366	0	0	0	0	44	594	52
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	671	0	0	523	0	0	0	0	0	690	0
Heavy Vehicles (%)	13%	13%	13%	10%	10%	10%	2%	2%	2%	8%	8%	8%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1264			810						1291	
v/s Ratio Prot		0.24										
v/s Ratio Perm					c0.29						0.24	
v/c Ratio		0.53			0.65						0.53	
Uniform Delay, d1		18.2			19.5						18.2	
Progression Factor		1.61			1.00						1.00	
Incremental Delay, d2		1.0			4.0						1.6	
Delay (s)		30.2			23.4						19.8	
Level of Service		C			C						B	
Approach Delay (s)		30.2			23.4			0.0			19.8	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	238	0	0	0	119	5	32	69	0	0	0	191
Future Volume (Veh/h)	238	0	0	0	119	5	32	69	0	0	0	191
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.81	0.81	0.81	0.82	0.82	0.82
Hourly flow rate (vph)	267	0	0	0	140	6	40	85	0	0	0	233
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	241	165	0	282	398	85	233			85		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	241	165	0	282	398	85	233			85		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	51	100	100	100	73	99	97			100		
cM capacity (veh/h)	546	702	1079	650	519	966	1340			1512		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	267	146	125	233
Volume Left	267	0	40	0
Volume Right	0	6	0	233
cSH	546	529	1340	1700
Volume to Capacity	0.49	0.28	0.03	0.14
Queue Length 95th (ft)	67	28	2	0
Control Delay (s)	17.8	14.4	2.7	0.0
Lane LOS	C	B	A	
Approach Delay (s)	17.8	14.4	2.7	0.0
Approach LOS	C	B		

Intersection Summary				
Average Delay	9.3			
Intersection Capacity Utilization	35.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Synchro Analysis

AM No-Build 2025

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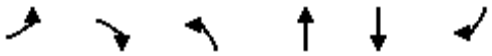
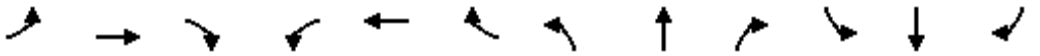


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	23	10	121	1047	665	30
Future Volume (vph)	23	10	121	1047	665	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.96		1.00	1.00	0.99	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1421		1477	2998	2720	
Flt Permitted	0.97		0.29	1.00	1.00	
Satd. Flow (perm)	1421		458	2998	2720	
Peak-hour factor, PHF	0.81	0.81	0.94	0.94	0.85	0.85
Adj. Flow (vph)	28	12	129	1114	782	35
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	40	0	129	1114	817	0
Heavy Vehicles (%)	17%	17%	10%	10%	16%	16%
Parking (#/hr)	3	3		2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	457		259	1698	1541	
v/s Ratio Prot	c0.03			c0.37	0.30	
v/s Ratio Perm			0.28			
v/c Ratio	0.09		0.50	0.66	0.53	
Uniform Delay, d1	21.3		11.8	13.5	12.1	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.4		6.7	2.0	1.3	
Delay (s)	21.6		18.5	15.4	13.4	
Level of Service	C		B	B	B	
Approach Delay (s)	21.6			15.8	13.4	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	121.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

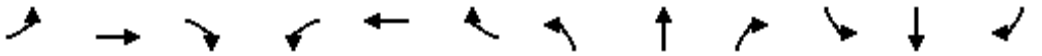


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	649	172	117	905	0	0	0	0	43	550	67
Future Volume (vph)	0	649	172	117	905	0	0	0	0	43	550	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.98	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3172	1419	1612	3249						2814	
Flt Permitted		1.00	1.00	0.25	1.00						1.00	
Satd. Flow (perm)		3172	1419	423	3249						2814	
Peak-hour factor, PHF	0.88	0.88	0.88	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85
Adj. Flow (vph)	0	738	195	124	963	0	0	0	0	51	647	79
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	738	195	124	963	0	0	0	0	0	777	0
Heavy Vehicles (%)	10%	10%	10%	12%	12%	12%	2%	2%	2%	13%	13%	13%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2					3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1057	473	271	1480						1219	
v/s Ratio Prot		0.23		0.03	c0.30							
v/s Ratio Perm			0.14	0.18							0.28	
v/c Ratio		0.70	0.41	0.46	0.65						0.64	
Uniform Delay, d1		26.1	23.2	25.3	19.0						20.0	
Progression Factor		1.00	1.00	1.31	1.34						1.00	
Incremental Delay, d2		3.8	2.6	3.6	1.5						2.6	
Delay (s)		29.9	25.8	36.8	26.9						22.5	
Level of Service		C	C	D	C						C	
Approach Delay (s)		29.0			28.0			0.0			22.5	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

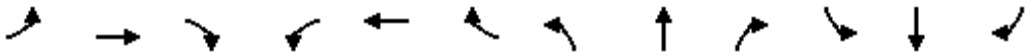
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	584	2	39	788	144	120	280	188	53	52	38
Future Volume (vph)	57	584	2	39	788	144	120	280	188	53	52	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.98			1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1572	3064		1491	4004			1774	1531		1788	
Flt Permitted	0.24	1.00		0.32	1.00			0.85	1.00		0.77	
Satd. Flow (perm)	391	3064		496	4004			1533	1531		1397	
Peak-hour factor, PHF	0.85	0.85	0.85	0.97	0.97	0.97	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	67	687	2	40	812	148	140	326	219	56	55	40
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	67	689	0	40	960	0	0	466	219	0	151	0
Heavy Vehicles (%)	11%	11%	11%	13%	13%	13%	2%	2%	2%	14%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	149	1174		190	1534			689	688		628	
v/s Ratio Prot		0.22			c0.24							
v/s Ratio Perm	0.17			0.08				c0.30	0.14		0.11	
v/c Ratio	0.45	0.59		0.21	0.63			0.68	0.32		0.24	
Uniform Delay, d1	13.8	14.7		12.4	15.0			13.0	10.6		10.2	
Progression Factor	0.64	0.63		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	7.7	1.7		2.5	1.9			5.3	1.2		0.9	
Delay (s)	16.5	11.0		14.9	16.9			18.3	11.8		11.1	
Level of Service	B	B		B	B			B	B		B	
Approach Delay (s)		11.5			16.9			16.2			11.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



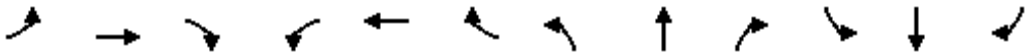
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	575	0	0	730	113	292	696	63	0	0	0
Future Volume (vph)	116	575	0	0	730	113	292	696	63	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			0.98			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1546	3533			3057			2831				
Flt Permitted	0.21	1.00			1.00			0.99				
Satd. Flow (perm)	338	3533			3057			2831				
Peak-hour factor, PHF	0.89	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	646	0	0	793	123	317	757	68	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	130	646	0	0	916	0	0	1142	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	13%	13%	13%	10%	10%	10%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	150	1570			1358			1258				
v/s Ratio Prot		0.18			0.30							
v/s Ratio Perm	c0.38							0.40				
v/c Ratio	0.87	0.41			0.67			0.91				
Uniform Delay, d1	22.6	17.0			19.8			23.3				
Progression Factor	1.93	2.07			1.00			1.00				
Incremental Delay, d2	34.9	0.6			2.7			11.1				
Delay (s)	78.4	35.8			22.5			34.4				
Level of Service	E	D			C			C				
Approach Delay (s)		43.0			22.5			34.4			0.0	
Approach LOS		D			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



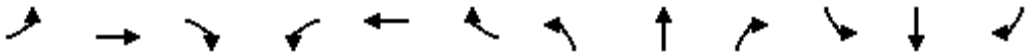
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	370	39	54	341	45	133	220	129	8	51	10
Future Volume (vph)	17	370	39	54	341	45	133	220	129	8	51	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.99			0.98			0.96			0.98	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1419	1472			2919			1559			1417	
Flt Permitted	0.42	1.00			0.79			0.88			0.94	
Satd. Flow (perm)	625	1472			2323			1392			1342	
Peak-hour factor, PHF	0.88	0.88	0.88	0.85	0.85	0.85	0.94	0.94	0.94	0.81	0.81	0.81
Adj. Flow (vph)	19	420	44	64	401	53	141	234	137	10	63	12
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	19	464	0	0	518	0	0	512	0	0	85	0
Heavy Vehicles (%)	23%	23%	23%	17%	17%	17%	12%	12%	12%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)											3	3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	284	670			1058			603			581	
v/s Ratio Prot		c0.32										
v/s Ratio Perm	0.03				0.22			c0.37			0.06	
v/c Ratio	0.07	0.69			0.49			0.85			0.15	
Uniform Delay, d1	13.8	19.5			17.2			22.9			15.4	
Progression Factor	1.00	1.00			2.02			1.00			1.00	
Incremental Delay, d2	0.5	5.8			1.4			13.9			0.5	
Delay (s)	14.2	25.3			36.0			36.8			16.0	
Level of Service	B	C			D			D			B	
Approach Delay (s)		24.9			36.0			36.8			16.0	
Approach LOS		C			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	31.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	230	0	0	159	18	222	544	160	32	0	111
Future Volume (vph)	109	230	0	0	159	18	222	544	160	32	0	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.90	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2631			3221		1479	3145			1602	
Flt Permitted		0.79			1.00		0.68	1.00			0.78	
Satd. Flow (perm)		2104			3221		1066	3145			1267	
Peak-hour factor, PHF	0.90	0.90	0.90	0.87	0.87	0.87	0.95	0.95	0.95	0.81	0.81	0.81
Adj. Flow (vph)	121	256	0	0	183	21	234	573	168	40	0	137
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	377	0	0	204	0	234	741	0	0	177	0
Heavy Vehicles (%)	18%	18%	18%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		911			1395		426	1258			506	
v/s Ratio Prot					0.06			c0.24				
v/s Ratio Perm		c0.18					0.22				0.14	
v/c Ratio		0.41			0.15		0.55	0.59			0.35	
Uniform Delay, d1		11.7			10.3		13.8	14.1			12.6	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		1.4			0.2		5.0	2.0			1.9	
Delay (s)		13.1			10.5		18.9	16.2			14.5	
Level of Service		B			B		B	B			B	
Approach Delay (s)		13.1			10.5			16.8			14.5	
Approach LOS		B			B			B			B	

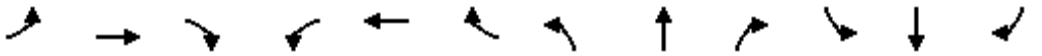
Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	326	186	93	398	0	0	0	0	14	381	42
Future Volume (vph)	0	326	186	93	398	0	0	0	0	14	381	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		2700			2980						2655	
Flt Permitted		1.00			0.71						1.00	
Satd. Flow (perm)		2700			2136						2655	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.92	0.92	0.92	0.86	0.86	0.86
Adj. Flow (vph)	0	370	211	103	442	0	0	0	0	16	443	49
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	581	0	0	545	0	0	0	0	0	508	0
Heavy Vehicles (%)	18%	18%	18%	12%	12%	12%	2%	2%	2%	18%	18%	18%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1200			949						1180	
v/s Ratio Prot		0.22										
v/s Ratio Perm					c0.26						0.19	
v/c Ratio		0.48			0.57						0.43	
Uniform Delay, d1		17.7			18.6						17.2	
Progression Factor		1.12			1.00						1.00	
Incremental Delay, d2		1.0			2.5						1.1	
Delay (s)		20.7			21.2						18.3	
Level of Service		C			C						B	
Approach Delay (s)		20.7			21.2			0.0			18.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	0	0	0	93	5	81	279	0	0	0	93
Future Volume (Veh/h)	305	0	0	0	93	5	81	279	0	0	0	93
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.81	0.81	0.81	0.83	0.83	0.83	0.84	0.84	0.84
Hourly flow rate (vph)	328	0	0	0	115	6	98	336	0	0	0	111
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	596	532	0	588	643	336	111			336		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	596	532	0	588	643	336	111			336		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.2			2.3		
p0 queue free %	0	100	100	100	68	99	93			100		
cM capacity (veh/h)	292	419	1076	392	360	695	1473			1169		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	328	121	434	111
Volume Left	328	0	98	0
Volume Right	0	6	0	111
cSH	292	369	1473	1700
Volume to Capacity	1.12	0.33	0.07	0.07
Queue Length 95th (ft)	339	35	5	0
Control Delay (s)	128.7	19.5	2.2	0.0
Lane LOS	F	C	A	
Approach Delay (s)	128.7	19.5	2.2	0.0
Approach LOS	F	C		

Intersection Summary				
Average Delay	45.8			
Intersection Capacity Utilization	49.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Synchro Analysis

PM No-Build 2025

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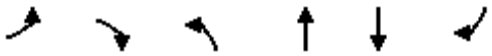
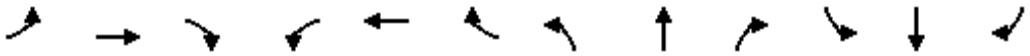


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	26	10	40	744	1008	42
Future Volume (vph)	26	10	40	744	1008	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.96		1.00	1.00	0.99	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1697		1291	2944	2869	
Flt Permitted	0.96		0.18	1.00	1.00	
Satd. Flow (perm)	1697		242	2944	2869	
Peak-hour factor, PHF	0.81	0.81	0.98	0.98	0.92	0.92
Adj. Flow (vph)	32	12	41	759	1096	46
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	44	0	41	759	1142	0
Heavy Vehicles (%)	11%	11%	12%	12%	10%	10%
Parking (#/hr)		3	2	2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	546		137	1668	1625	
v/s Ratio Prot	c0.03			0.26	c0.40	
v/s Ratio Perm			0.17			
v/c Ratio	0.08		0.30	0.46	0.70	
Uniform Delay, d1	21.2		10.2	11.4	14.0	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		5.5	0.9	2.6	
Delay (s)	21.5		15.7	12.3	16.6	
Level of Service	C		B	B	B	
Approach Delay (s)	21.5			12.5	16.6	
Approach LOS	C			B	B	

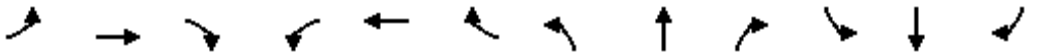
Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



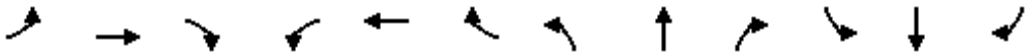
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	772	298	198	852	0	0	0	0	48	781	91
Future Volume (vph)	0	772	298	198	852	0	0	0	0	48	781	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.99	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3231	1446	1671	3369						2947	
Flt Permitted		1.00	1.00	0.19	1.00						1.00	
Satd. Flow (perm)		3231	1446	339	3369						2947	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	848	327	213	916	0	0	0	0	53	868	101
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	848	327	213	916	0	0	0	0	0	1022	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	2%	2%	2%	8%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2	2				3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1077	482	243	1534						1277	
v/s Ratio Prot		0.26		c0.06	0.27							
v/s Ratio Perm			0.23	c0.34							0.35	
v/c Ratio		0.79	0.68	0.88	0.60						0.80	
Uniform Delay, d1		27.1	25.8	30.5	18.3						22.1	
Progression Factor		1.00	1.00	0.59	0.44						1.00	
Incremental Delay, d2		5.8	7.5	27.4	1.3						5.3	
Delay (s)		33.0	33.3	45.5	9.4						27.5	
Level of Service		C	C	D	A						C	
Approach Delay (s)		33.1			16.2			0.0			27.5	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



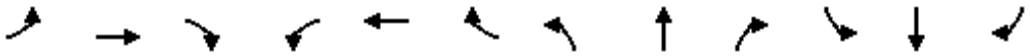
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	795	18	80	787	77	25	135	162	118	100	48
Future Volume (vph)	61	795	18	80	787	77	25	135	162	118	100	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1601	3111		1560	4231			1787	1531		1939	
Flt Permitted	0.24	1.00		0.22	1.00			0.92	1.00		0.78	
Satd. Flow (perm)	405	3111		355	4231			1663	1531		1551	
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.90	0.90	0.90	0.82	0.82	0.82
Adj. Flow (vph)	66	855	19	88	865	85	28	150	180	144	122	59
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	66	874	0	88	950	0	0	178	180	0	325	0
Heavy Vehicles (%)	9%	9%	9%	8%	8%	8%	2%	2%	2%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	155	1192		136	1621			748	688		697	
v/s Ratio Prot		c0.28			0.22							
v/s Ratio Perm	0.16			0.25				0.11	0.12		c0.21	
v/c Ratio	0.43	0.73		0.65	0.59			0.24	0.26		0.47	
Uniform Delay, d1	13.6	15.9		15.2	14.7			10.2	10.3		11.5	
Progression Factor	1.47	1.39		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	6.2	3.0		21.4	1.6			0.7	0.9		2.2	
Delay (s)	26.2	25.0		36.6	16.3			10.9	11.2		13.7	
Level of Service	C	C		D	B			B	B		B	
Approach Delay (s)		25.1			18.0			11.1			13.7	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



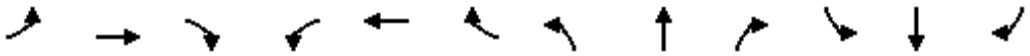
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	724	0	0	826	5	224	508	87	0	0	0
Future Volume (vph)	95	724	0	0	826	5	224	508	87	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			1.00			0.98				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1589	3633			3323			2762				
Flt Permitted	0.22	1.00			1.00			0.99				
Satd. Flow (perm)	364	3633			3323			2762				
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	103	787	0	0	888	5	238	540	93	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	103	787	0	0	893	0	0	871	0	0	0	0
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	12%	12%	12%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	161	1614			1476			1227				
v/s Ratio Prot		0.22			0.27							
v/s Ratio Perm	c0.28							0.32				
v/c Ratio	0.64	0.49			0.61			0.71				
Uniform Delay, d1	19.4	17.7			19.0			20.3				
Progression Factor	0.19	0.08			1.00			1.00				
Incremental Delay, d2	11.0	0.6			1.8			3.5				
Delay (s)	14.6	2.0			20.8			23.8				
Level of Service	B	A			C			C				
Approach Delay (s)		3.5			20.8			23.8			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



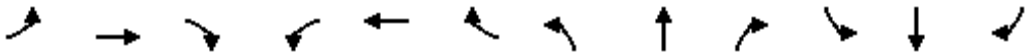
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	526	88	80	298	36	58	93	121	18	99	29
Future Volume (vph)	44	526	88	80	298	36	58	93	121	18	99	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.98			0.99			0.94			0.97	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1517	1563			2966			1582			1391	
Flt Permitted	0.46	1.00			0.60			0.90			0.94	
Satd. Flow (perm)	734	1563			1804			1441			1318	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.83	0.83	0.83	0.92	0.92	0.92
Adj. Flow (vph)	46	554	93	88	327	40	70	112	146	20	108	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	46	647	0	0	455	0	0	328	0	0	160	0
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	8%	8%	8%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)										3	3	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	334	712			821			624			571	
v/s Ratio Prot		c0.41										
v/s Ratio Perm	0.06				0.25			c0.23			0.12	
v/c Ratio	0.14	0.91			0.55			0.53			0.28	
Uniform Delay, d1	14.2	22.8			17.8			18.7			16.4	
Progression Factor	1.00	1.00			1.16			1.00			1.00	
Incremental Delay, d2	0.9	17.6			2.0			3.1			1.2	
Delay (s)	15.1	40.4			22.7			21.9			17.7	
Level of Service	B	D			C			C			B	
Approach Delay (s)		38.7			22.7			21.9			17.7	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	108.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	350	0	0	166	20	168	359	82	36	0	184
Future Volume (vph)	167	350	0	0	166	20	168	359	82	36	0	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.89	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2723			3283		1439	3079			1592	
Flt Permitted		0.77			1.00		0.60	1.00			0.87	
Satd. Flow (perm)		2141			3283		912	3079			1399	
Peak-hour factor, PHF	0.97	0.97	0.97	0.86	0.86	0.86	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	172	361	0	0	193	23	193	413	94	41	0	211
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	533	0	0	216	0	193	507	0	0	252	0
Heavy Vehicles (%)	14%	14%	14%	1%	1%	1%	11%	11%	11%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		927			1422		364	1231			559	
v/s Ratio Prot					0.07			0.16				
v/s Ratio Perm		c0.25					c0.21				0.18	
v/c Ratio		0.57			0.15		0.53	0.41			0.45	
Uniform Delay, d1		12.8			10.3		13.7	12.9			13.2	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		2.6			0.2		5.4	1.0			2.6	
Delay (s)		15.4			10.5		19.1	14.0			15.8	
Level of Service		B			B		B	B			B	
Approach Delay (s)		15.4			10.5			15.4			15.8	
Approach LOS		B			B			B			B	

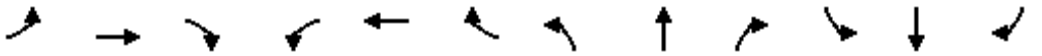
Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	463	200	150	365	0	0	0	0	42	569	51
Future Volume (vph)	0	463	200	150	365	0	0	0	0	42	569	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		2847			3019						2905	
Flt Permitted		1.00			0.59						1.00	
Satd. Flow (perm)		2847			1799						2905	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	0	493	213	163	397	0	0	0	0	45	612	55
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	706	0	0	560	0	0	0	0	0	712	0
Heavy Vehicles (%)	13%	13%	13%	10%	10%	10%	2%	2%	2%	8%	8%	8%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1265			799						1291	
v/s Ratio Prot		0.25										
v/s Ratio Perm					c0.31						0.25	
v/c Ratio		0.56			0.70						0.55	
Uniform Delay, d1		18.5			20.2						18.4	
Progression Factor		1.59			1.00						1.00	
Incremental Delay, d2		1.0			5.1						1.7	
Delay (s)		30.4			25.3						20.1	
Level of Service		C			C						C	
Approach Delay (s)		30.4			25.3			0.0			20.1	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	0	0	0	122	5	33	71	0	0	0	197
Future Volume (Veh/h)	245	0	0	0	122	5	33	71	0	0	0	197
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.81	0.81	0.81	0.82	0.82	0.82
Hourly flow rate (vph)	275	0	0	0	144	6	41	88	0	0	0	240
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	248	170	0	290	410	88	240			88		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	248	170	0	290	410	88	240			88		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	48	100	100	100	72	99	97			100		
cM capacity (veh/h)	533	697	1079	641	511	962	1333			1508		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	275	150	129	240
Volume Left	275	0	41	0
Volume Right	0	6	0	240
cSH	533	520	1333	1700
Volume to Capacity	0.52	0.29	0.03	0.14
Queue Length 95th (ft)	73	30	2	0
Control Delay (s)	18.7	14.7	2.6	0.0
Lane LOS	C	B	A	
Approach Delay (s)	18.7	14.7	2.6	0.0
Approach LOS	C	B		

Intersection Summary				
Average Delay	9.7			
Intersection Capacity Utilization	35.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Synchro Analysis

AM Build (Alternative A) 2025

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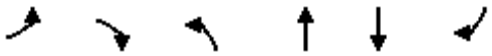
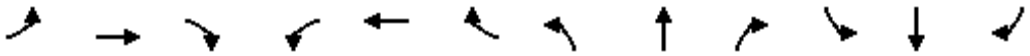


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	21	9	110	1063	665	27
Future Volume (vph)	21	9	110	1063	665	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.96		1.00	1.00	0.99	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1422		1477	2998	2721	
Flt Permitted	0.97		0.30	1.00	1.00	
Satd. Flow (perm)	1422		460	2998	2721	
Peak-hour factor, PHF	0.81	0.81	0.94	0.94	0.85	0.85
Adj. Flow (vph)	26	11	117	1131	782	32
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	37	0	117	1131	814	0
Heavy Vehicles (%)	17%	17%	10%	10%	16%	16%
Parking (#/hr)	3	3		2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	458		260	1698	1541	
v/s Ratio Prot	c0.03			c0.38	0.30	
v/s Ratio Perm			0.25			
v/c Ratio	0.08		0.45	0.67	0.53	
Uniform Delay, d1	21.2		11.3	13.6	12.1	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		5.5	2.1	1.3	
Delay (s)	21.6		16.9	15.7	13.4	
Level of Service	C		B	B	B	
Approach Delay (s)	21.6			15.8	13.4	
Approach LOS	C			B	B	

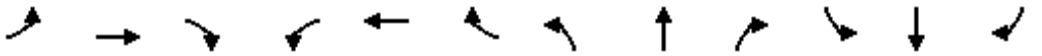
Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	121.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



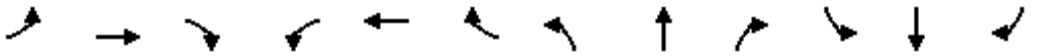
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	649	172	123	905	0	0	0	0	43	563	67
Future Volume (vph)	0	649	172	123	905	0	0	0	0	43	563	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.99	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3172	1419	1612	3249						2815	
Flt Permitted		1.00	1.00	0.25	1.00						1.00	
Satd. Flow (perm)		3172	1419	423	3249						2815	
Peak-hour factor, PHF	0.88	0.88	0.88	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85
Adj. Flow (vph)	0	738	195	131	963	0	0	0	0	51	662	79
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	738	195	131	963	0	0	0	0	0	792	0
Heavy Vehicles (%)	10%	10%	10%	12%	12%	12%	2%	2%	2%	13%	13%	13%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2					3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1057	473	271	1480						1219	
v/s Ratio Prot		0.23		0.03	c0.30							
v/s Ratio Perm			0.14	0.19							0.28	
v/c Ratio		0.70	0.41	0.48	0.65						0.65	
Uniform Delay, d1		26.1	23.2	25.7	19.0						20.1	
Progression Factor		1.00	1.00	1.30	1.34						1.00	
Incremental Delay, d2		3.8	2.6	3.9	1.5						2.7	
Delay (s)		29.9	25.8	37.4	26.8						22.8	
Level of Service		C	C	D	C						C	
Approach Delay (s)		29.0			28.1			0.0			22.8	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



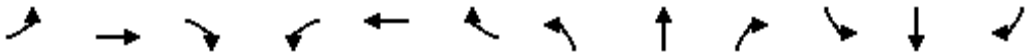
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	585	2	39	788	144	121	285	188	53	52	38
Future Volume (vph)	57	585	2	39	788	144	121	285	188	53	52	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.98			1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1572	3064		1491	4004			1774	1531		1788	
Flt Permitted	0.24	1.00		0.32	1.00			0.85	1.00		0.77	
Satd. Flow (perm)	391	3064		495	4004			1534	1531		1394	
Peak-hour factor, PHF	0.85	0.85	0.85	0.97	0.97	0.97	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	67	688	2	40	812	148	141	331	219	56	55	40
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	67	690	0	40	960	0	0	472	219	0	151	0
Heavy Vehicles (%)	11%	11%	11%	13%	13%	13%	2%	2%	2%	14%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	149	1174		189	1534			690	688		627	
v/s Ratio Prot		0.23			c0.24							
v/s Ratio Perm	0.17			0.08				c0.31	0.14		0.11	
v/c Ratio	0.45	0.59		0.21	0.63			0.68	0.32		0.24	
Uniform Delay, d1	13.8	14.7		12.4	15.0			13.1	10.6		10.2	
Progression Factor	0.64	0.63		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	7.7	1.8		2.5	1.9			5.4	1.2		0.9	
Delay (s)	16.5	11.0		15.0	16.9			18.6	11.8		11.1	
Level of Service	B	B		B	B			B	B		B	
Approach Delay (s)		11.5			16.9			16.4			11.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



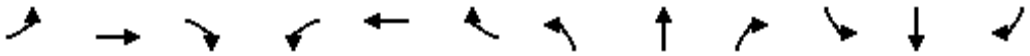
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	575	0	0	731	113	297	704	63	0	0	0
Future Volume (vph)	116	575	0	0	731	113	297	704	63	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			0.98			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1546	3533			3057			2832				
Flt Permitted	0.21	1.00			1.00			0.99				
Satd. Flow (perm)	337	3533			3057			2832				
Peak-hour factor, PHF	0.89	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	646	0	0	795	123	323	765	68	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	130	646	0	0	918	0	0	1156	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	13%	13%	13%	10%	10%	10%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	149	1570			1358			1258				
v/s Ratio Prot		0.18			0.30							
v/s Ratio Perm	c0.39							0.41				
v/c Ratio	0.87	0.41			0.68			0.92				
Uniform Delay, d1	22.7	17.0			19.9			23.5				
Progression Factor	1.92	2.07			1.00			1.00				
Incremental Delay, d2	35.9	0.6			2.7			12.2				
Delay (s)	79.6	35.8			22.6			35.6				
Level of Service	E	D			C			D				
Approach Delay (s)		43.2			22.6			35.6			0.0	
Approach LOS		D			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



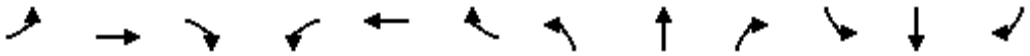
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	371	39	54	337	45	137	220	129	8	51	10
Future Volume (vph)	17	371	39	54	337	45	137	220	129	8	51	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.99			0.98			0.96			0.98	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1419	1472			2918			1559			1417	
Flt Permitted	0.42	1.00			0.79			0.88			0.94	
Satd. Flow (perm)	630	1472			2317			1387			1342	
Peak-hour factor, PHF	0.88	0.88	0.88	0.85	0.85	0.85	0.94	0.94	0.94	0.81	0.81	0.81
Adj. Flow (vph)	19	422	44	64	396	53	146	234	137	10	63	12
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	19	466	0	0	513	0	0	517	0	0	85	0
Heavy Vehicles (%)	23%	23%	23%	17%	17%	17%	12%	12%	12%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)											3	3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	287	670			1055			601			581	
v/s Ratio Prot		c0.32										
v/s Ratio Perm	0.03				0.22			c0.37			0.06	
v/c Ratio	0.07	0.70			0.49			0.86			0.15	
Uniform Delay, d1	13.8	19.5			17.1			23.0			15.4	
Progression Factor	1.00	1.00			1.99			1.00			1.00	
Incremental Delay, d2	0.4	5.9			1.3			14.9			0.5	
Delay (s)	14.2	25.4			35.5			37.9			16.0	
Level of Service	B	C			D			D			B	
Approach Delay (s)		25.0			35.5			37.9			16.0	
Approach LOS		C			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	230	0	0	159	18	230	544	160	32	0	111
Future Volume (vph)	109	230	0	0	159	18	230	544	160	32	0	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.90	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2631			3221		1479	3145			1602	
Flt Permitted		0.79			1.00		0.68	1.00			0.78	
Satd. Flow (perm)		2104			3221		1066	3145			1267	
Peak-hour factor, PHF	0.90	0.90	0.90	0.87	0.87	0.87	0.95	0.95	0.95	0.81	0.81	0.81
Adj. Flow (vph)	121	256	0	0	183	21	242	573	168	40	0	137
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	377	0	0	204	0	242	741	0	0	177	0
Heavy Vehicles (%)	18%	18%	18%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		911			1395		426	1258			506	
v/s Ratio Prot					0.06			c0.24				
v/s Ratio Perm		c0.18					0.23				0.14	
v/c Ratio		0.41			0.15		0.57	0.59			0.35	
Uniform Delay, d1		11.7			10.3		14.0	14.1			12.6	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		1.4			0.2		5.4	2.0			1.9	
Delay (s)		13.1			10.5		19.4	16.2			14.5	
Level of Service		B			B		B	B			B	
Approach Delay (s)		13.1			10.5			17.0			14.5	
Approach LOS		B			B			B			B	

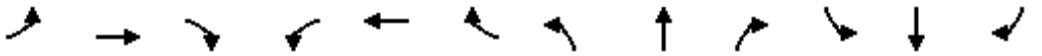
Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	326	187	105	394	0	0	0	0	14	381	42
Future Volume (vph)	0	326	187	105	394	0	0	0	0	14	381	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		2699			2977						2655	
Flt Permitted		1.00			0.68						1.00	
Satd. Flow (perm)		2699			2045						2655	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.92	0.92	0.92	0.86	0.86	0.86
Adj. Flow (vph)	0	370	212	117	438	0	0	0	0	16	443	49
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	583	0	0	555	0	0	0	0	0	508	0
Heavy Vehicles (%)	18%	18%	18%	12%	12%	12%	2%	2%	2%	18%	18%	18%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1199			908						1180	
v/s Ratio Prot		0.22										
v/s Ratio Perm					c0.27						0.19	
v/c Ratio		0.49			0.61						0.43	
Uniform Delay, d1		17.7			19.1						17.2	
Progression Factor		1.12			1.00						1.00	
Incremental Delay, d2		1.0			3.1						1.1	
Delay (s)		20.8			22.1						18.3	
Level of Service		C			C						B	
Approach Delay (s)		20.8			22.1			0.0			18.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	0	0	0	93	10	81	279	0	0	0	93
Future Volume (Veh/h)	305	0	0	0	93	10	81	279	0	0	0	93
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.81	0.81	0.81	0.83	0.83	0.83	0.84	0.84	0.84
Hourly flow rate (vph)	328	0	0	0	115	12	98	336	0	0	0	111
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	602	532	0	588	643	336	111			336		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	602	532	0	588	643	336	111			336		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.2			2.3		
p0 queue free %	0	100	100	100	68	98	93			100		
cM capacity (veh/h)	287	419	1076	392	360	695	1473			1169		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	328	127	434	111
Volume Left	328	0	98	0
Volume Right	0	12	0	111
cSH	287	377	1473	1700
Volume to Capacity	1.14	0.34	0.07	0.07
Queue Length 95th (ft)	349	36	5	0
Control Delay (s)	136.4	19.3	2.2	0.0
Lane LOS	F	C	A	
Approach Delay (s)	136.4	19.3	2.2	0.0
Approach LOS	F	C		

Intersection Summary				
Average Delay	48.2			
Intersection Capacity Utilization	49.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Synchro Analysis

PM Build (Alternative A) 2025

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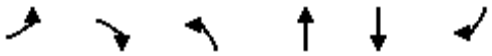
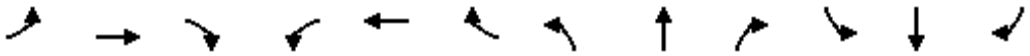


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	22	8	32	755	1013	34
Future Volume (vph)	22	8	32	755	1013	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.96		1.00	1.00	1.00	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1697		1291	2944	2873	
Flt Permitted	0.96		0.18	1.00	1.00	
Satd. Flow (perm)	1697		243	2944	2873	
Peak-hour factor, PHF	0.81	0.81	0.98	0.98	0.92	0.92
Adj. Flow (vph)	27	10	33	770	1101	37
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	37	0	33	770	1138	0
Heavy Vehicles (%)	11%	11%	12%	12%	10%	10%
Parking (#/hr)		3	2	2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	546		137	1668	1628	
v/s Ratio Prot	c0.02			0.26	c0.40	
v/s Ratio Perm			0.14			
v/c Ratio	0.07		0.24	0.46	0.70	
Uniform Delay, d1	21.1		9.8	11.4	14.0	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.2		4.1	0.9	2.5	
Delay (s)	21.4		13.9	12.4	16.5	
Level of Service	C		B	B	B	
Approach Delay (s)	21.4			12.4	16.5	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

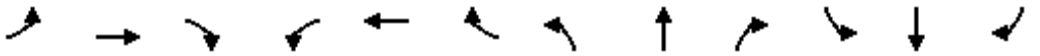
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	773	300	201	852	0	0	0	0	48	791	91
Future Volume (vph)	0	773	300	201	852	0	0	0	0	48	791	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.99	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3231	1446	1671	3369						2948	
Flt Permitted		1.00	1.00	0.19	1.00						1.00	
Satd. Flow (perm)		3231	1446	338	3369						2948	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	849	330	216	916	0	0	0	0	53	879	101
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	849	330	216	916	0	0	0	0	0	1033	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	2%	2%	2%	8%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2	2				3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1077	482	242	1534						1277	
v/s Ratio Prot		0.26		c0.06	0.27							
v/s Ratio Perm			0.23	c0.35							0.35	
v/c Ratio		0.79	0.68	0.89	0.60						0.81	
Uniform Delay, d1		27.1	25.9	30.6	18.3						22.2	
Progression Factor		1.00	1.00	0.59	0.44						1.00	
Incremental Delay, d2		5.9	7.7	29.8	1.3						5.6	
Delay (s)		33.0	33.6	48.0	9.5						27.9	
Level of Service		C	C	D	A						C	
Approach Delay (s)		33.2			16.8			0.0			27.9	
Approach LOS		C			B			A			C	

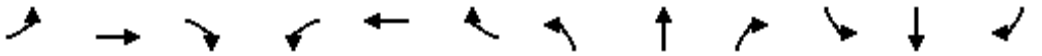
Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



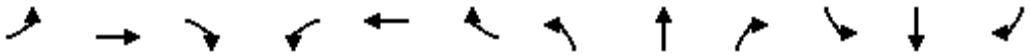
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	795	18	80	787	77	27	162	165	118	100	48
Future Volume (vph)	61	795	18	80	787	77	27	162	165	118	100	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1601	3111		1560	4231			1788	1531		1939	
Flt Permitted	0.24	1.00		0.22	1.00			0.93	1.00		0.77	
Satd. Flow (perm)	405	3111		355	4231			1671	1531		1523	
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.90	0.90	0.90	0.82	0.82	0.82
Adj. Flow (vph)	66	855	19	88	865	85	30	180	183	144	122	59
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	66	874	0	88	950	0	0	210	183	0	325	0
Heavy Vehicles (%)	9%	9%	9%	8%	8%	8%	2%	2%	2%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	155	1192		136	1621			751	688		685	
v/s Ratio Prot		c0.28			0.22							
v/s Ratio Perm	0.16			0.25				0.13	0.12		c0.21	
v/c Ratio	0.43	0.73		0.65	0.59			0.28	0.27		0.47	
Uniform Delay, d1	13.6	15.9		15.2	14.7			10.4	10.3		11.5	
Progression Factor	1.47	1.39		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	6.2	3.0		21.4	1.6			0.9	0.9		2.3	
Delay (s)	26.2	25.1		36.6	16.3			11.3	11.3		13.9	
Level of Service	C	C		D	B			B	B		B	
Approach Delay (s)		25.1			18.0			11.3			13.9	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



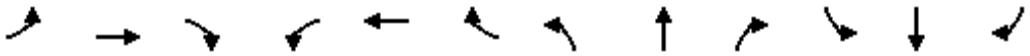
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	725	0	0	827	5	226	494	87	0	0	0
Future Volume (vph)	95	725	0	0	827	5	226	494	87	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			1.00			0.98				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1589	3633			3323			2760				
Flt Permitted	0.22	1.00			1.00			0.99				
Satd. Flow (perm)	364	3633			3323			2760				
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	103	788	0	0	889	5	240	526	93	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	103	788	0	0	894	0	0	859	0	0	0	0
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	12%	12%	12%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	161	1614			1476			1226				
v/s Ratio Prot		0.22			0.27							
v/s Ratio Perm	c0.28							0.31				
v/c Ratio	0.64	0.49			0.61			0.70				
Uniform Delay, d1	19.4	17.7			19.0			20.2				
Progression Factor	0.19	0.08			1.00			1.00				
Incremental Delay, d2	10.9	0.6			1.9			3.4				
Delay (s)	14.6	2.0			20.9			23.5				
Level of Service	B	A			C			C				
Approach Delay (s)		3.5			20.9			23.5			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



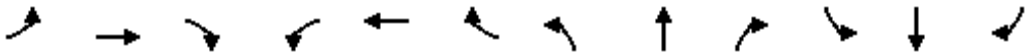
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	528	88	80	276	36	85	94	121	18	99	29
Future Volume (vph)	44	528	88	80	276	36	85	94	121	18	99	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.98			0.99			0.95			0.97	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1517	1563			2962			1585			1391	
Flt Permitted	0.48	1.00			0.60			0.86			0.94	
Satd. Flow (perm)	760	1563			1790			1386			1313	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.83	0.83	0.83	0.92	0.92	0.92
Adj. Flow (vph)	46	556	93	88	303	40	102	113	146	20	108	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	46	649	0	0	431	0	0	361	0	0	160	0
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	8%	8%	8%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)										3	3	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	346	712			815			600			568	
v/s Ratio Prot		c0.42										
v/s Ratio Perm	0.06				0.24			c0.26			0.12	
v/c Ratio	0.13	0.91			0.53			0.60			0.28	
Uniform Delay, d1	14.2	22.8			17.6			19.5			16.5	
Progression Factor	1.00	1.00			1.15			1.00			1.00	
Incremental Delay, d2	0.8	18.0			1.8			4.4			1.2	
Delay (s)	15.0	40.8			22.1			24.0			17.7	
Level of Service	B	D			C			C			B	
Approach Delay (s)		39.1			22.1			24.0			17.7	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	108.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	350	0	0	166	20	154	359	82	36	0	184
Future Volume (vph)	167	350	0	0	166	20	154	359	82	36	0	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.89	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2723			3283		1439	3079			1592	
Flt Permitted		0.77			1.00		0.60	1.00			0.87	
Satd. Flow (perm)		2141			3283		912	3079			1399	
Peak-hour factor, PHF	0.97	0.97	0.97	0.86	0.86	0.86	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	172	361	0	0	193	23	177	413	94	41	0	211
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	533	0	0	216	0	177	507	0	0	252	0
Heavy Vehicles (%)	14%	14%	14%	1%	1%	1%	11%	11%	11%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		927			1422		364	1231			559	
v/s Ratio Prot					0.07			0.16				
v/s Ratio Perm		c0.25					c0.19				0.18	
v/c Ratio		0.57			0.15		0.49	0.41			0.45	
Uniform Delay, d1		12.8			10.3		13.4	12.9			13.2	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		2.6			0.2		4.6	1.0			2.6	
Delay (s)		15.4			10.5		18.0	14.0			15.8	
Level of Service		B			B		B	B			B	
Approach Delay (s)		15.4			10.5			15.0			15.8	
Approach LOS		B			B			B			B	

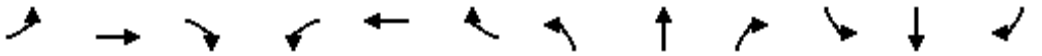
Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	463	202	158	344	0	0	0	0	42	570	51
Future Volume (vph)	0	463	202	158	344	0	0	0	0	42	570	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		2846			3016						2905	
Flt Permitted		1.00			0.58						1.00	
Satd. Flow (perm)		2846			1776						2905	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	0	493	215	172	374	0	0	0	0	45	613	55
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	708	0	0	546	0	0	0	0	0	713	0
Heavy Vehicles (%)	13%	13%	13%	10%	10%	10%	2%	2%	2%	8%	8%	8%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1264			789						1291	
v/s Ratio Prot		0.25										
v/s Ratio Perm					c0.31						0.25	
v/c Ratio		0.56			0.69						0.55	
Uniform Delay, d1		18.5			20.1						18.4	
Progression Factor		1.58			1.00						1.00	
Incremental Delay, d2		1.0			4.9						1.7	
Delay (s)		30.3			25.0						20.1	
Level of Service		C			C						C	
Approach Delay (s)		30.3			25.0			0.0			20.1	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	0	0	0	122	37	33	71	0	0	0	197
Future Volume (Veh/h)	245	0	0	0	122	37	33	71	0	0	0	197
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.81	0.81	0.81	0.82	0.82	0.82
Hourly flow rate (vph)	275	0	0	0	144	44	41	88	0	0	0	240
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	286	170	0	290	410	88	240			88		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	286	170	0	290	410	88	240			88		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	43	100	100	100	72	95	97			100		
cM capacity (veh/h)	483	697	1079	641	511	962	1333			1508		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	275	188	129	240
Volume Left	275	0	41	0
Volume Right	0	44	0	240
cSH	483	574	1333	1700
Volume to Capacity	0.57	0.33	0.03	0.14
Queue Length 95th (ft)	87	36	2	0
Control Delay (s)	21.8	14.3	2.6	0.0
Lane LOS	C	B	A	
Approach Delay (s)	21.8	14.3	2.6	0.0
Approach LOS	C	B		

Intersection Summary				
Average Delay	10.9			
Intersection Capacity Utilization	37.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Synchro Analysis

AM Build (Alternative B) 2025

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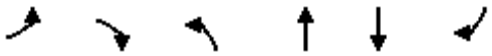
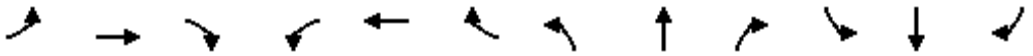


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	21	9	110	1064	665	27
Future Volume (vph)	21	9	110	1064	665	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.96		1.00	1.00	0.99	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1422		1477	2998	2721	
Flt Permitted	0.97		0.30	1.00	1.00	
Satd. Flow (perm)	1422		460	2998	2721	
Peak-hour factor, PHF	0.81	0.81	0.94	0.94	0.85	0.85
Adj. Flow (vph)	26	11	117	1132	782	32
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	37	0	117	1132	814	0
Heavy Vehicles (%)	17%	17%	10%	10%	16%	16%
Parking (#/hr)	3	3		2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	458		260	1698	1541	
v/s Ratio Prot	c0.03			c0.38	0.30	
v/s Ratio Perm			0.25			
v/c Ratio	0.08		0.45	0.67	0.53	
Uniform Delay, d1	21.2		11.3	13.6	12.1	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		5.5	2.1	1.3	
Delay (s)	21.6		16.9	15.7	13.4	
Level of Service	C		B	B	B	
Approach Delay (s)	21.6			15.8	13.4	
Approach LOS	C			B	B	

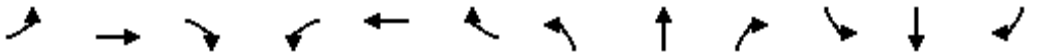
Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	121.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



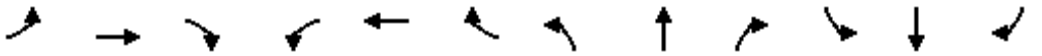
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	649	172	123	905	0	0	0	0	43	563	67
Future Volume (vph)	0	649	172	123	905	0	0	0	0	43	563	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.99	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3172	1419	1612	3249						2815	
Flt Permitted		1.00	1.00	0.25	1.00						1.00	
Satd. Flow (perm)		3172	1419	423	3249						2815	
Peak-hour factor, PHF	0.88	0.88	0.88	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85
Adj. Flow (vph)	0	738	195	131	963	0	0	0	0	51	662	79
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	738	195	131	963	0	0	0	0	0	792	0
Heavy Vehicles (%)	10%	10%	10%	12%	12%	12%	2%	2%	2%	13%	13%	13%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2					3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1057	473	271	1480						1219	
v/s Ratio Prot		0.23		0.03	c0.30							
v/s Ratio Perm			0.14	0.19							0.28	
v/c Ratio		0.70	0.41	0.48	0.65						0.65	
Uniform Delay, d1		26.1	23.2	25.7	19.0						20.1	
Progression Factor		1.00	1.00	1.30	1.34						1.00	
Incremental Delay, d2		3.8	2.6	3.9	1.5						2.7	
Delay (s)		29.9	25.8	37.4	26.8						22.8	
Level of Service		C	C	D	C						C	
Approach Delay (s)		29.0			28.1			0.0			22.8	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



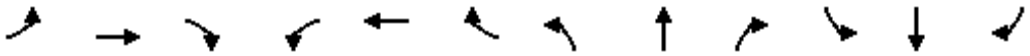
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	585	2	39	788	144	121	285	188	53	52	38
Future Volume (vph)	57	585	2	39	788	144	121	285	188	53	52	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.98			1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1572	3064		1491	4004			1774	1531		1788	
Flt Permitted	0.24	1.00		0.32	1.00			0.85	1.00		0.77	
Satd. Flow (perm)	391	3064		495	4004			1534	1531		1394	
Peak-hour factor, PHF	0.85	0.85	0.85	0.97	0.97	0.97	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	67	688	2	40	812	148	141	331	219	56	55	40
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	67	690	0	40	960	0	0	472	219	0	151	0
Heavy Vehicles (%)	11%	11%	11%	13%	13%	13%	2%	2%	2%	14%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	149	1174		189	1534			690	688		627	
v/s Ratio Prot		0.23			c0.24							
v/s Ratio Perm	0.17			0.08				c0.31	0.14		0.11	
v/c Ratio	0.45	0.59		0.21	0.63			0.68	0.32		0.24	
Uniform Delay, d1	13.8	14.7		12.4	15.0			13.1	10.6		10.2	
Progression Factor	0.64	0.63		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	7.7	1.8		2.5	1.9			5.4	1.2		0.9	
Delay (s)	16.5	11.0		15.0	16.9			18.6	11.8		11.1	
Level of Service	B	B		B	B			B	B		B	
Approach Delay (s)		11.5			16.9			16.4			11.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



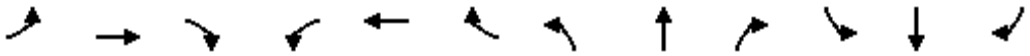
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	575	0	0	731	113	297	704	63	0	0	0
Future Volume (vph)	116	575	0	0	731	113	297	704	63	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			0.98			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1546	3533			3057			2832				
Flt Permitted	0.21	1.00			1.00			0.99				
Satd. Flow (perm)	337	3533			3057			2832				
Peak-hour factor, PHF	0.89	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	646	0	0	795	123	323	765	68	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	130	646	0	0	918	0	0	1156	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	13%	13%	13%	10%	10%	10%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	149	1570			1358			1258				
v/s Ratio Prot		0.18			0.30							
v/s Ratio Perm	c0.39							0.41				
v/c Ratio	0.87	0.41			0.68			0.92				
Uniform Delay, d1	22.7	17.0			19.9			23.5				
Progression Factor	1.92	2.07			1.00			1.00				
Incremental Delay, d2	35.9	0.6			2.7			12.2				
Delay (s)	79.6	35.8			22.6			35.6				
Level of Service	E	D			C			D				
Approach Delay (s)		43.2			22.6			35.6			0.0	
Approach LOS		D			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



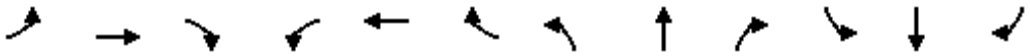
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	371	39	54	337	45	137	220	129	8	51	10
Future Volume (vph)	17	371	39	54	337	45	137	220	129	8	51	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.99			0.98			0.96			0.98	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1419	1472			2918			1559			1417	
Flt Permitted	0.42	1.00			0.79			0.88			0.94	
Satd. Flow (perm)	630	1472			2317			1387			1342	
Peak-hour factor, PHF	0.88	0.88	0.88	0.85	0.85	0.85	0.94	0.94	0.94	0.81	0.81	0.81
Adj. Flow (vph)	19	422	44	64	396	53	146	234	137	10	63	12
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	19	466	0	0	513	0	0	517	0	0	85	0
Heavy Vehicles (%)	23%	23%	23%	17%	17%	17%	12%	12%	12%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)											3	3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	287	670			1055			601			581	
v/s Ratio Prot		c0.32										
v/s Ratio Perm	0.03				0.22			c0.37			0.06	
v/c Ratio	0.07	0.70			0.49			0.86			0.15	
Uniform Delay, d1	13.8	19.5			17.1			23.0			15.4	
Progression Factor	1.00	1.00			1.99			1.00			1.00	
Incremental Delay, d2	0.4	5.9			1.3			14.9			0.5	
Delay (s)	14.2	25.4			35.5			37.9			16.0	
Level of Service	B	C			D			D			B	
Approach Delay (s)		25.0			35.5			37.9			16.0	
Approach LOS		C			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	230	0	0	159	18	230	544	160	32	0	111
Future Volume (vph)	109	230	0	0	159	18	230	544	160	32	0	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.90	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2631			3221		1479	3145			1602	
Flt Permitted		0.79			1.00		0.68	1.00			0.78	
Satd. Flow (perm)		2104			3221		1066	3145			1267	
Peak-hour factor, PHF	0.90	0.90	0.90	0.87	0.87	0.87	0.95	0.95	0.95	0.81	0.81	0.81
Adj. Flow (vph)	121	256	0	0	183	21	242	573	168	40	0	137
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	377	0	0	204	0	242	741	0	0	177	0
Heavy Vehicles (%)	18%	18%	18%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		911			1395		426	1258			506	
v/s Ratio Prot					0.06			c0.24				
v/s Ratio Perm		c0.18					0.23				0.14	
v/c Ratio		0.41			0.15		0.57	0.59			0.35	
Uniform Delay, d1		11.7			10.3		14.0	14.1			12.6	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		1.4			0.2		5.4	2.0			1.9	
Delay (s)		13.1			10.5		19.4	16.2			14.5	
Level of Service		B			B		B	B			B	
Approach Delay (s)		13.1			10.5			17.0			14.5	
Approach LOS		B			B			B			B	

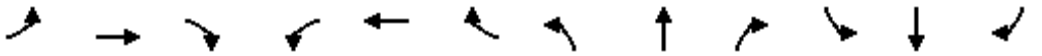
Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	326	187	105	394	0	0	0	0	14	381	42
Future Volume (vph)	0	326	187	105	394	0	0	0	0	14	381	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		2699			2977						2655	
Flt Permitted		1.00			0.68						1.00	
Satd. Flow (perm)		2699			2045						2655	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.92	0.92	0.92	0.86	0.86	0.86
Adj. Flow (vph)	0	370	212	117	438	0	0	0	0	16	443	49
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	583	0	0	555	0	0	0	0	0	508	0
Heavy Vehicles (%)	18%	18%	18%	12%	12%	12%	2%	2%	2%	18%	18%	18%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1199			908						1180	
v/s Ratio Prot		0.22										
v/s Ratio Perm					c0.27						0.19	
v/c Ratio		0.49			0.61						0.43	
Uniform Delay, d1		17.7			19.1						17.2	
Progression Factor		1.12			1.00						1.00	
Incremental Delay, d2		1.0			3.1						1.1	
Delay (s)		20.8			22.1						18.3	
Level of Service		C			C						B	
Approach Delay (s)		20.8			22.1			0.0			18.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	0	0	0	93	10	81	279	0	0	0	93
Future Volume (Veh/h)	305	0	0	0	93	10	81	279	0	0	0	93
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.81	0.81	0.81	0.83	0.83	0.83	0.84	0.84	0.84
Hourly flow rate (vph)	328	0	0	0	115	12	98	336	0	0	0	111
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	602	532	0	588	643	336	111			336		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	602	532	0	588	643	336	111			336		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.2			2.3		
p0 queue free %	0	100	100	100	68	98	93			100		
cM capacity (veh/h)	287	419	1076	392	360	695	1473			1169		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	328	127	434	111
Volume Left	328	0	98	0
Volume Right	0	12	0	111
cSH	287	377	1473	1700
Volume to Capacity	1.14	0.34	0.07	0.07
Queue Length 95th (ft)	349	36	5	0
Control Delay (s)	136.4	19.3	2.2	0.0
Lane LOS	F	C	A	
Approach Delay (s)	136.4	19.3	2.2	0.0
Approach LOS	F	C		

Intersection Summary				
Average Delay	48.2			
Intersection Capacity Utilization	49.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Synchro Analysis

PM Build (Alternative B) 2025

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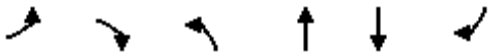
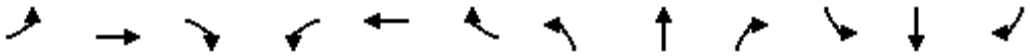


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	22	8	32	755	1013	34
Future Volume (vph)	22	8	32	755	1013	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.96		1.00	1.00	1.00	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1697		1291	2944	2873	
Flt Permitted	0.96		0.18	1.00	1.00	
Satd. Flow (perm)	1697		243	2944	2873	
Peak-hour factor, PHF	0.81	0.81	0.98	0.98	0.92	0.92
Adj. Flow (vph)	27	10	33	770	1101	37
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	37	0	33	770	1138	0
Heavy Vehicles (%)	11%	11%	12%	12%	10%	10%
Parking (#/hr)		3	2	2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	546		137	1668	1628	
v/s Ratio Prot	c0.02			0.26	c0.40	
v/s Ratio Perm			0.14			
v/c Ratio	0.07		0.24	0.46	0.70	
Uniform Delay, d1	21.1		9.8	11.4	14.0	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.2		4.1	0.9	2.5	
Delay (s)	21.4		13.9	12.4	16.5	
Level of Service	C		B	B	B	
Approach Delay (s)	21.4			12.4	16.5	
Approach LOS	C			B	B	

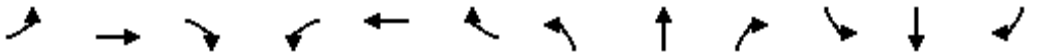
Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



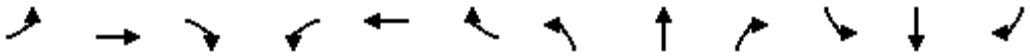
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	774	301	201	852	0	0	0	0	48	792	91
Future Volume (vph)	0	774	301	201	852	0	0	0	0	48	792	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.99	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3231	1446	1671	3369						2948	
Flt Permitted		1.00	1.00	0.19	1.00						1.00	
Satd. Flow (perm)		3231	1446	336	3369						2948	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	851	331	216	916	0	0	0	0	53	880	101
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	851	331	216	916	0	0	0	0	0	1034	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	2%	2%	2%	8%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2	2				3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1077	482	242	1534						1277	
v/s Ratio Prot		0.26		c0.06	0.27							
v/s Ratio Perm			0.23	c0.35							0.35	
v/c Ratio		0.79	0.69	0.89	0.60						0.81	
Uniform Delay, d1		27.2	25.9	30.6	18.3						22.3	
Progression Factor		1.00	1.00	0.60	0.44						1.00	
Incremental Delay, d2		5.9	7.8	29.8	1.3						5.6	
Delay (s)		33.1	33.7	48.1	9.5						27.9	
Level of Service		C	C	D	A						C	
Approach Delay (s)		33.2			16.9			0.0			27.9	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



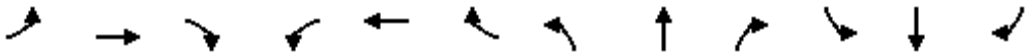
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	795	18	80	787	77	27	164	166	118	100	48
Future Volume (vph)	61	795	18	80	787	77	27	164	166	118	100	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1601	3111		1560	4231			1788	1531		1939	
Flt Permitted	0.24	1.00		0.22	1.00			0.93	1.00		0.77	
Satd. Flow (perm)	405	3111		355	4231			1673	1531		1522	
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.90	0.90	0.90	0.82	0.82	0.82
Adj. Flow (vph)	66	855	19	88	865	85	30	182	184	144	122	59
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	66	874	0	88	950	0	0	212	184	0	325	0
Heavy Vehicles (%)	9%	9%	9%	8%	8%	8%	2%	2%	2%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	155	1192		136	1621			752	688		684	
v/s Ratio Prot		c0.28			0.22							
v/s Ratio Perm	0.16			0.25				0.13	0.12		c0.21	
v/c Ratio	0.43	0.73		0.65	0.59			0.28	0.27		0.48	
Uniform Delay, d1	13.6	15.9		15.2	14.7			10.4	10.3		11.5	
Progression Factor	1.47	1.39		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	6.2	3.0		21.4	1.6			0.9	1.0		2.4	
Delay (s)	26.2	25.1		36.6	16.3			11.3	11.3		13.9	
Level of Service	C	C		D	B			B	B		B	
Approach Delay (s)		25.1			18.0			11.3			13.9	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



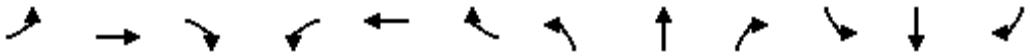
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	726	0	0	827	5	227	494	87	0	0	0
Future Volume (vph)	95	726	0	0	827	5	227	494	87	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			1.00			0.98				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1589	3633			3323			2760				
Flt Permitted	0.22	1.00			1.00			0.99				
Satd. Flow (perm)	364	3633			3323			2760				
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	103	789	0	0	889	5	241	526	93	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	103	789	0	0	894	0	0	860	0	0	0	0
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	12%	12%	12%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	161	1614			1476			1226				
v/s Ratio Prot		0.22			0.27							
v/s Ratio Perm	c0.28							0.31				
v/c Ratio	0.64	0.49			0.61			0.70				
Uniform Delay, d1	19.4	17.7			19.0			20.2				
Progression Factor	0.19	0.08			1.00			1.00				
Incremental Delay, d2	10.9	0.6			1.9			3.4				
Delay (s)	14.5	2.0			20.9			23.5				
Level of Service	B	A			C			C				
Approach Delay (s)		3.5			20.9			23.5			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



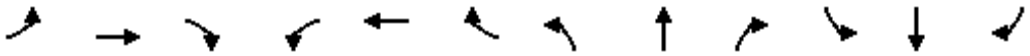
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	528	88	80	276	36	86	94	121	18	99	29
Future Volume (vph)	44	528	88	80	276	36	86	94	121	18	99	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.98			0.99			0.95			0.97	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1517	1563			2962			1586			1391	
Flt Permitted	0.48	1.00			0.60			0.86			0.94	
Satd. Flow (perm)	760	1563			1790			1382			1313	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.83	0.83	0.83	0.92	0.92	0.92
Adj. Flow (vph)	46	556	93	88	303	40	104	113	146	20	108	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	46	649	0	0	431	0	0	363	0	0	160	0
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	8%	8%	8%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)										3	3	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	346	712			815			598			568	
v/s Ratio Prot		c0.42										
v/s Ratio Perm	0.06				0.24			c0.26			0.12	
v/c Ratio	0.13	0.91			0.53			0.61			0.28	
Uniform Delay, d1	14.2	22.8			17.6			19.6			16.5	
Progression Factor	1.00	1.00			1.15			1.00			1.00	
Incremental Delay, d2	0.8	18.0			1.8			4.5			1.2	
Delay (s)	15.0	40.8			22.1			24.1			17.7	
Level of Service	B	D			C			C			B	
Approach Delay (s)		39.1			22.1			24.1			17.7	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	109.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	350	0	0	166	20	154	359	82	36	0	184
Future Volume (vph)	167	350	0	0	166	20	154	359	82	36	0	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.89	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2723			3283		1439	3079			1592	
Flt Permitted		0.77			1.00		0.60	1.00			0.87	
Satd. Flow (perm)		2141			3283		912	3079			1399	
Peak-hour factor, PHF	0.97	0.97	0.97	0.86	0.86	0.86	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	172	361	0	0	193	23	177	413	94	41	0	211
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	533	0	0	216	0	177	507	0	0	252	0
Heavy Vehicles (%)	14%	14%	14%	1%	1%	1%	11%	11%	11%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		927			1422		364	1231			559	
v/s Ratio Prot					0.07			0.16				
v/s Ratio Perm		c0.25					c0.19				0.18	
v/c Ratio		0.57			0.15		0.49	0.41			0.45	
Uniform Delay, d1		12.8			10.3		13.4	12.9			13.2	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		2.6			0.2		4.6	1.0			2.6	
Delay (s)		15.4			10.5		18.0	14.0			15.8	
Level of Service		B			B		B	B			B	
Approach Delay (s)		15.4			10.5			15.0			15.8	
Approach LOS		B			B			B			B	

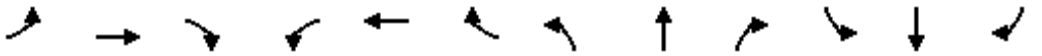
Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	463	202	158	344	0	0	0	0	42	570	51
Future Volume (vph)	0	463	202	158	344	0	0	0	0	42	570	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		2846			3016						2905	
Flt Permitted		1.00			0.58						1.00	
Satd. Flow (perm)		2846			1776						2905	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	0	493	215	172	374	0	0	0	0	45	613	55
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	708	0	0	546	0	0	0	0	0	713	0
Heavy Vehicles (%)	13%	13%	13%	10%	10%	10%	2%	2%	2%	8%	8%	8%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1264			789						1291	
v/s Ratio Prot		0.25										
v/s Ratio Perm					c0.31						0.25	
v/c Ratio		0.56			0.69						0.55	
Uniform Delay, d1		18.5			20.1						18.4	
Progression Factor		1.58			1.00						1.00	
Incremental Delay, d2		0.9			4.9						1.7	
Delay (s)		30.2			25.0						20.1	
Level of Service		C			C						C	
Approach Delay (s)		30.2			25.0			0.0			20.1	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	0	0	0	122	40	33	71	0	0	0	197
Future Volume (Veh/h)	245	0	0	0	122	40	33	71	0	0	0	197
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.81	0.81	0.81	0.82	0.82	0.82
Hourly flow rate (vph)	275	0	0	0	144	47	41	88	0	0	0	240
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	289	170	0	290	410	88	240			88		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	289	170	0	290	410	88	240			88		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	43	100	100	100	72	95	97			100		
cM capacity (veh/h)	479	697	1079	641	511	962	1333			1508		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	275	191	129	240
Volume Left	275	0	41	0
Volume Right	0	47	0	240
cSH	479	577	1333	1700
Volume to Capacity	0.57	0.33	0.03	0.14
Queue Length 95th (ft)	89	36	2	0
Control Delay (s)	22.1	14.3	2.6	0.0
Lane LOS	C	B	A	
Approach Delay (s)	22.1	14.3	2.6	0.0
Approach LOS	C	B		

Intersection Summary				
Average Delay	11.0			
Intersection Capacity Utilization	38.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Synchro Analysis

AM Build (Alternative D) 2025

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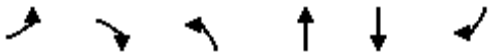
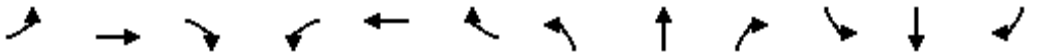


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	21	9	110	1065	666	27
Future Volume (vph)	21	9	110	1065	666	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.96		1.00	1.00	0.99	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1422		1477	2998	2721	
Flt Permitted	0.97		0.30	1.00	1.00	
Satd. Flow (perm)	1422		459	2998	2721	
Peak-hour factor, PHF	0.81	0.81	0.94	0.94	0.85	0.85
Adj. Flow (vph)	26	11	117	1133	784	32
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	37	0	117	1133	816	0
Heavy Vehicles (%)	17%	17%	10%	10%	16%	16%
Parking (#/hr)	3	3		2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	458		260	1698	1541	
v/s Ratio Prot	c0.03			c0.38	0.30	
v/s Ratio Perm			0.25			
v/c Ratio	0.08		0.45	0.67	0.53	
Uniform Delay, d1	21.2		11.3	13.6	12.1	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		5.5	2.1	1.3	
Delay (s)	21.6		16.9	15.7	13.4	
Level of Service	C		B	B	B	
Approach Delay (s)	21.6			15.8	13.4	
Approach LOS	C			B	B	

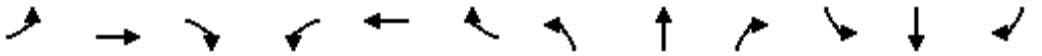
Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	121.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



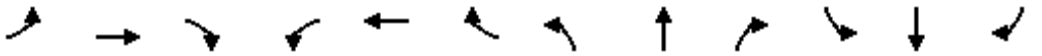
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	649	172	124	905	0	0	0	0	43	563	67
Future Volume (vph)	0	649	172	124	905	0	0	0	0	43	563	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.99	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3172	1419	1612	3249						2815	
Flt Permitted		1.00	1.00	0.25	1.00						1.00	
Satd. Flow (perm)		3172	1419	423	3249						2815	
Peak-hour factor, PHF	0.88	0.88	0.88	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85
Adj. Flow (vph)	0	738	195	132	963	0	0	0	0	51	662	79
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	738	195	132	963	0	0	0	0	0	792	0
Heavy Vehicles (%)	10%	10%	10%	12%	12%	12%	2%	2%	2%	13%	13%	13%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2					3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1057	473	271	1480						1219	
v/s Ratio Prot		0.23		0.03	c0.30							
v/s Ratio Perm			0.14	0.19							0.28	
v/c Ratio		0.70	0.41	0.49	0.65						0.65	
Uniform Delay, d1		26.1	23.2	25.7	19.0						20.1	
Progression Factor		1.00	1.00	1.30	1.34						1.00	
Incremental Delay, d2		3.8	2.6	4.0	1.4						2.7	
Delay (s)		29.9	25.8	37.4	26.8						22.8	
Level of Service		C	C	D	C						C	
Approach Delay (s)		29.0			28.1			0.0			22.8	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



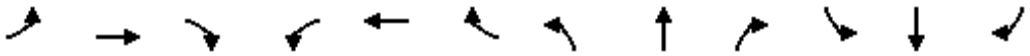
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	585	2	39	788	144	121	285	188	53	52	38
Future Volume (vph)	57	585	2	39	788	144	121	285	188	53	52	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.98			1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1572	3064		1491	4004			1774	1531		1788	
Flt Permitted	0.24	1.00		0.32	1.00			0.85	1.00		0.77	
Satd. Flow (perm)	391	3064		495	4004			1534	1531		1394	
Peak-hour factor, PHF	0.85	0.85	0.85	0.97	0.97	0.97	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	67	688	2	40	812	148	141	331	219	56	55	40
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	67	690	0	40	960	0	0	472	219	0	151	0
Heavy Vehicles (%)	11%	11%	11%	13%	13%	13%	2%	2%	2%	14%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	149	1174		189	1534			690	688		627	
v/s Ratio Prot		0.23			c0.24							
v/s Ratio Perm	0.17			0.08				c0.31	0.14		0.11	
v/c Ratio	0.45	0.59		0.21	0.63			0.68	0.32		0.24	
Uniform Delay, d1	13.8	14.7		12.4	15.0			13.1	10.6		10.2	
Progression Factor	0.64	0.63		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	7.7	1.8		2.5	1.9			5.4	1.2		0.9	
Delay (s)	16.5	11.0		15.0	16.9			18.6	11.8		11.1	
Level of Service	B	B		B	B			B	B		B	
Approach Delay (s)		11.5			16.9			16.4			11.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



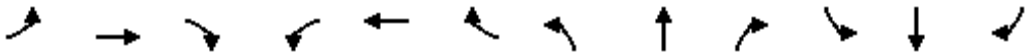
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	575	0	0	731	113	298	704	63	0	0	0
Future Volume (vph)	116	575	0	0	731	113	298	704	63	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			0.98			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1546	3533			3057			2831				
Flt Permitted	0.21	1.00			1.00			0.99				
Satd. Flow (perm)	337	3533			3057			2831				
Peak-hour factor, PHF	0.89	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	646	0	0	795	123	324	765	68	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	130	646	0	0	918	0	0	1157	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	13%	13%	13%	10%	10%	10%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	149	1570			1358			1258				
v/s Ratio Prot		0.18			0.30							
v/s Ratio Perm	c0.39							0.41				
v/c Ratio	0.87	0.41			0.68			0.92				
Uniform Delay, d1	22.7	17.0			19.9			23.5				
Progression Factor	1.92	2.07			1.00			1.00				
Incremental Delay, d2	35.9	0.6			2.7			12.2				
Delay (s)	79.6	35.8			22.6			35.7				
Level of Service	E	D			C			D				
Approach Delay (s)		43.2			22.6			35.7			0.0	
Approach LOS		D			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



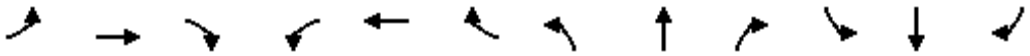
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	371	39	54	337	45	137	220	129	8	51	10
Future Volume (vph)	17	371	39	54	337	45	137	220	129	8	51	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.99			0.98			0.96			0.98	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1419	1472			2918			1559			1417	
Flt Permitted	0.42	1.00			0.79			0.88			0.94	
Satd. Flow (perm)	630	1472			2317			1387			1342	
Peak-hour factor, PHF	0.88	0.88	0.88	0.85	0.85	0.85	0.94	0.94	0.94	0.81	0.81	0.81
Adj. Flow (vph)	19	422	44	64	396	53	146	234	137	10	63	12
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	19	466	0	0	513	0	0	517	0	0	85	0
Heavy Vehicles (%)	23%	23%	23%	17%	17%	17%	12%	12%	12%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)											3	3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	287	670			1055			601			581	
v/s Ratio Prot		c0.32										
v/s Ratio Perm	0.03				0.22			c0.37			0.06	
v/c Ratio	0.07	0.70			0.49			0.86			0.15	
Uniform Delay, d1	13.8	19.5			17.1			23.0			15.4	
Progression Factor	1.00	1.00			1.99			1.00			1.00	
Incremental Delay, d2	0.4	5.9			1.3			14.9			0.5	
Delay (s)	14.2	25.4			35.5			37.9			16.0	
Level of Service	B	C			D			D			B	
Approach Delay (s)		25.0			35.5			37.9			16.0	
Approach LOS		C			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	230	0	0	159	18	230	544	160	32	0	111
Future Volume (vph)	109	230	0	0	159	18	230	544	160	32	0	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.90	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2631			3221		1479	3145			1602	
Flt Permitted		0.79			1.00		0.68	1.00			0.78	
Satd. Flow (perm)		2104			3221		1066	3145			1267	
Peak-hour factor, PHF	0.90	0.90	0.90	0.87	0.87	0.87	0.95	0.95	0.95	0.81	0.81	0.81
Adj. Flow (vph)	121	256	0	0	183	21	242	573	168	40	0	137
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	377	0	0	204	0	242	741	0	0	177	0
Heavy Vehicles (%)	18%	18%	18%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		911			1395		426	1258			506	
v/s Ratio Prot					0.06			c0.24				
v/s Ratio Perm		c0.18					0.23				0.14	
v/c Ratio		0.41			0.15		0.57	0.59			0.35	
Uniform Delay, d1		11.7			10.3		14.0	14.1			12.6	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		1.4			0.2		5.4	2.0			1.9	
Delay (s)		13.1			10.5		19.4	16.2			14.5	
Level of Service		B			B		B	B			B	
Approach Delay (s)		13.1			10.5			17.0			14.5	
Approach LOS		B			B			B			B	

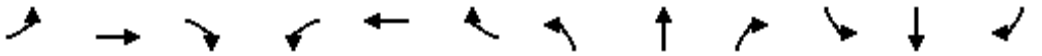
Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	326	187	105	394	0	0	0	0	14	381	42
Future Volume (vph)	0	326	187	105	394	0	0	0	0	14	381	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		2699			2977						2655	
Flt Permitted		1.00			0.68						1.00	
Satd. Flow (perm)		2699			2045						2655	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.92	0.92	0.92	0.86	0.86	0.86
Adj. Flow (vph)	0	370	212	117	438	0	0	0	0	16	443	49
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	583	0	0	555	0	0	0	0	0	508	0
Heavy Vehicles (%)	18%	18%	18%	12%	12%	12%	2%	2%	2%	18%	18%	18%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1199			908						1180	
v/s Ratio Prot		0.22										
v/s Ratio Perm					c0.27						0.19	
v/c Ratio		0.49			0.61						0.43	
Uniform Delay, d1		17.7			19.1						17.2	
Progression Factor		1.12			1.00						1.00	
Incremental Delay, d2		1.0			3.1						1.1	
Delay (s)		20.8			22.1						18.3	
Level of Service		C			C						B	
Approach Delay (s)		20.8			22.1			0.0			18.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	0	0	0	93	11	81	279	0	0	0	93
Future Volume (Veh/h)	305	0	0	0	93	11	81	279	0	0	0	93
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.81	0.81	0.81	0.83	0.83	0.83	0.84	0.84	0.84
Hourly flow rate (vph)	328	0	0	0	115	14	98	336	0	0	0	111
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	604	532	0	588	643	336	111			336		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	604	532	0	588	643	336	111			336		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.2			2.3		
p0 queue free %	0	100	100	100	68	98	93			100		
cM capacity (veh/h)	285	419	1076	392	360	695	1473			1169		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	328	129	434	111
Volume Left	328	0	98	0
Volume Right	0	14	0	111
cSH	285	380	1473	1700
Volume to Capacity	1.15	0.34	0.07	0.07
Queue Length 95th (ft)	352	37	5	0
Control Delay (s)	139.1	19.3	2.2	0.0
Lane LOS	F	C	A	
Approach Delay (s)	139.1	19.3	2.2	0.0
Approach LOS	F	C		

Intersection Summary				
Average Delay	49.0			
Intersection Capacity Utilization	49.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Synchro Analysis

PM Build (Alternative D) 2025

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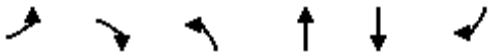
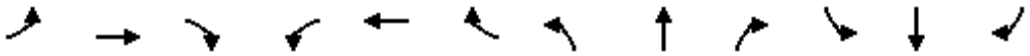


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	22	8	32	756	1014	34
Future Volume (vph)	22	8	32	756	1014	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.96		1.00	1.00	1.00	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1697		1291	2944	2873	
Flt Permitted	0.96		0.18	1.00	1.00	
Satd. Flow (perm)	1697		243	2944	2873	
Peak-hour factor, PHF	0.81	0.81	0.98	0.98	0.92	0.92
Adj. Flow (vph)	27	10	33	771	1102	37
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	37	0	33	771	1139	0
Heavy Vehicles (%)	11%	11%	12%	12%	10%	10%
Parking (#/hr)		3	2	2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	546		137	1668	1628	
v/s Ratio Prot	c0.02			0.26	c0.40	
v/s Ratio Perm			0.14			
v/c Ratio	0.07		0.24	0.46	0.70	
Uniform Delay, d1	21.1		9.8	11.4	14.0	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.2		4.1	0.9	2.5	
Delay (s)	21.4		13.9	12.4	16.5	
Level of Service	C		B	B	B	
Approach Delay (s)	21.4			12.4	16.5	
Approach LOS	C			B	B	

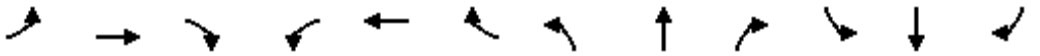
Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



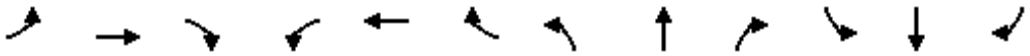
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	774	301	202	852	0	0	0	0	48	793	91
Future Volume (vph)	0	774	301	202	852	0	0	0	0	48	793	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.99	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3231	1446	1671	3369						2948	
Flt Permitted		1.00	1.00	0.19	1.00						1.00	
Satd. Flow (perm)		3231	1446	336	3369						2948	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	851	331	217	916	0	0	0	0	53	881	101
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	851	331	217	916	0	0	0	0	0	1035	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	2%	2%	2%	8%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2	2				3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1077	482	242	1534						1277	
v/s Ratio Prot		0.26		c0.06	0.27							
v/s Ratio Perm			0.23	c0.35							0.35	
v/c Ratio		0.79	0.69	0.90	0.60						0.81	
Uniform Delay, d1		27.2	25.9	30.7	18.3						22.3	
Progression Factor		1.00	1.00	0.60	0.45						1.00	
Incremental Delay, d2		5.9	7.8	30.4	1.3						5.7	
Delay (s)		33.1	33.7	48.7	9.5						27.9	
Level of Service		C	C	D	A						C	
Approach Delay (s)		33.2			17.0			0.0			27.9	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



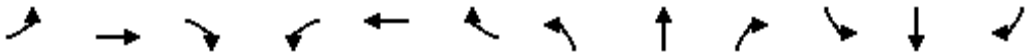
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	796	18	80	787	77	27	165	167	118	100	48
Future Volume (vph)	61	796	18	80	787	77	27	165	167	118	100	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1601	3111		1560	4231			1788	1531		1939	
Flt Permitted	0.24	1.00		0.22	1.00			0.93	1.00		0.77	
Satd. Flow (perm)	405	3111		354	4231			1673	1531		1521	
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.90	0.90	0.90	0.82	0.82	0.82
Adj. Flow (vph)	66	856	19	88	865	85	30	183	186	144	122	59
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	66	875	0	88	950	0	0	213	186	0	325	0
Heavy Vehicles (%)	9%	9%	9%	8%	8%	8%	2%	2%	2%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	155	1192		135	1621			752	688		684	
v/s Ratio Prot		c0.28			0.22							
v/s Ratio Perm	0.16			0.25				0.13	0.12		c0.21	
v/c Ratio	0.43	0.73		0.65	0.59			0.28	0.27		0.48	
Uniform Delay, d1	13.6	15.9		15.2	14.7			10.4	10.3		11.5	
Progression Factor	1.47	1.39		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	6.2	3.0		21.9	1.6			0.9	1.0		2.4	
Delay (s)	26.2	25.1		37.1	16.3			11.3	11.3		13.9	
Level of Service	C	C		D	B			B	B		B	
Approach Delay (s)		25.2			18.0			11.3			13.9	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



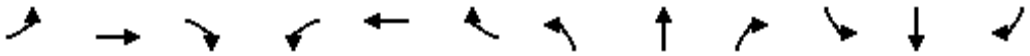
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	726	0	0	827	5	228	494	87	0	0	0
Future Volume (vph)	95	726	0	0	827	5	228	494	87	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			1.00			0.98				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1589	3633			3323			2760				
Flt Permitted	0.22	1.00			1.00			0.99				
Satd. Flow (perm)	364	3633			3323			2760				
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	103	789	0	0	889	5	243	526	93	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	103	789	0	0	894	0	0	862	0	0	0	0
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	12%	12%	12%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	161	1614			1476			1226				
v/s Ratio Prot		0.22			0.27							
v/s Ratio Perm	c0.28							0.31				
v/c Ratio	0.64	0.49			0.61			0.70				
Uniform Delay, d1	19.4	17.7			19.0			20.2				
Progression Factor	0.19	0.08			1.00			1.00				
Incremental Delay, d2	10.9	0.6			1.9			3.4				
Delay (s)	14.5	2.0			20.9			23.6				
Level of Service	B	A			C			C				
Approach Delay (s)		3.5			20.9			23.6			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



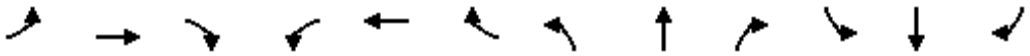
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	529	88	80	276	36	88	94	121	18	99	29
Future Volume (vph)	44	529	88	80	276	36	88	94	121	18	99	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.98			0.99			0.95			0.97	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1517	1563			2962			1586			1391	
Flt Permitted	0.48	1.00			0.60			0.86			0.94	
Satd. Flow (perm)	760	1563			1789			1379			1313	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.83	0.83	0.83	0.92	0.92	0.92
Adj. Flow (vph)	46	557	93	88	303	40	106	113	146	20	108	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	46	650	0	0	431	0	0	365	0	0	160	0
Heavy Vehicles (%)	15%	15%	15%	15%	15%	15%	8%	8%	8%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)										3	3	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	346	712			814			597			568	
v/s Ratio Prot		c0.42										
v/s Ratio Perm	0.06				0.24			c0.26			0.12	
v/c Ratio	0.13	0.91			0.53			0.61			0.28	
Uniform Delay, d1	14.2	22.8			17.6			19.7			16.5	
Progression Factor	1.00	1.00			1.15			1.00			1.00	
Incremental Delay, d2	0.8	18.1			1.8			4.6			1.2	
Delay (s)	15.0	41.0			22.1			24.3			17.7	
Level of Service	B	D			C			C			B	
Approach Delay (s)		39.2			22.1			24.3			17.7	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	109.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	350	0	0	166	20	154	359	82	36	0	184
Future Volume (vph)	167	350	0	0	166	20	154	359	82	36	0	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.89	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2723			3283		1439	3079			1592	
Flt Permitted		0.77			1.00		0.60	1.00			0.87	
Satd. Flow (perm)		2141			3283		912	3079			1399	
Peak-hour factor, PHF	0.97	0.97	0.97	0.86	0.86	0.86	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	172	361	0	0	193	23	177	413	94	41	0	211
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	533	0	0	216	0	177	507	0	0	252	0
Heavy Vehicles (%)	14%	14%	14%	1%	1%	1%	11%	11%	11%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		927			1422		364	1231			559	
v/s Ratio Prot					0.07			0.16				
v/s Ratio Perm		c0.25					c0.19				0.18	
v/c Ratio		0.57			0.15		0.49	0.41			0.45	
Uniform Delay, d1		12.8			10.3		13.4	12.9			13.2	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		2.6			0.2		4.6	1.0			2.6	
Delay (s)		15.4			10.5		18.0	14.0			15.8	
Level of Service		B			B		B	B			B	
Approach Delay (s)		15.4			10.5			15.0			15.8	
Approach LOS		B			B			B			B	

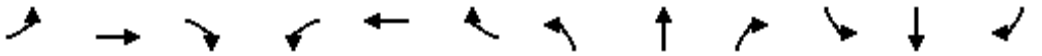
Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	463	203	158	344	0	0	0	0	42	570	51
Future Volume (vph)	0	463	203	158	344	0	0	0	0	42	570	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		2845			3016						2905	
Flt Permitted		1.00			0.58						1.00	
Satd. Flow (perm)		2845			1775						2905	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	0	493	216	172	374	0	0	0	0	45	613	55
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	709	0	0	546	0	0	0	0	0	713	0
Heavy Vehicles (%)	13%	13%	13%	10%	10%	10%	2%	2%	2%	8%	8%	8%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1264			788						1291	
v/s Ratio Prot		0.25										
v/s Ratio Perm					c0.31						0.25	
v/c Ratio		0.56			0.69						0.55	
Uniform Delay, d1		18.5			20.1						18.4	
Progression Factor		1.58			1.00						1.00	
Incremental Delay, d2		0.9			5.0						1.7	
Delay (s)		30.3			25.0						20.1	
Level of Service		C			C						C	
Approach Delay (s)		30.3			25.0			0.0			20.1	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	0	0	0	122	43	33	71	0	0	0	197
Future Volume (Veh/h)	245	0	0	0	122	43	33	71	0	0	0	197
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.81	0.81	0.81	0.82	0.82	0.82
Hourly flow rate (vph)	275	0	0	0	144	51	41	88	0	0	0	240
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	293	170	0	290	410	88	240			88		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	293	170	0	290	410	88	240			88		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	42	100	100	100	72	95	97			100		
cM capacity (veh/h)	474	697	1079	641	511	962	1333			1508		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	275	195	129	240
Volume Left	275	0	41	0
Volume Right	0	51	0	240
cSH	474	582	1333	1700
Volume to Capacity	0.58	0.34	0.03	0.14
Queue Length 95th (ft)	90	37	2	0
Control Delay (s)	22.5	14.3	2.6	0.0
Lane LOS	C	B	A	
Approach Delay (s)	22.5	14.3	2.6	0.0
Approach LOS	C	B		

Intersection Summary				
Average Delay	11.1			
Intersection Capacity Utilization	38.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Synchro Analysis

AM Mitigated Build (Alternative D) 2025

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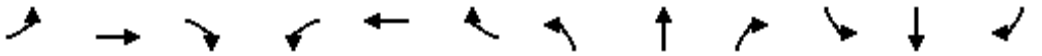

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	0	0	0	93	11	81	279	0	0	0	93
Future Volume (vph)	305	0	0	0	93	11	81	279	0	0	0	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	16	12	12	14	12	12	12	13
Total Lost time (s)	5.0				5.0			5.0				5.0
Lane Util. Factor	1.00				1.00			1.00				1.00
Frt	1.00				0.99			1.00				0.86
Flt Protected	0.95				1.00			0.99				1.00
Satd. Flow (prot)	1724				1765			1722				1342
Flt Permitted	0.67				1.00			0.99				1.00
Satd. Flow (perm)	1224				1765			1722				1342
Peak-hour factor, PHF	0.93	0.93	0.93	0.81	0.81	0.81	0.83	0.83	0.83	0.84	0.84	0.84
Adj. Flow (vph)	328	0	0	0	115	14	98	336	0	0	0	111
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	328	0	0	0	129	0	0	434	0	0	0	111
Heavy Vehicles (%)	5%	5%	5%	7%	7%	7%	3%	3%	3%	12%	12%	12%
Parking (#/hr)	3				2	2	3	3	3			3
Turn Type	Perm				NA		Perm	NA				Perm
Protected Phases					8			2				
Permitted Phases	4						2					6
Actuated Green, G (s)	40.0				40.0			40.0				40.0
Effective Green, g (s)	40.0				40.0			40.0				40.0
Actuated g/C Ratio	0.44				0.44			0.44				0.44
Clearance Time (s)	5.0				5.0			5.0				5.0
Lane Grp Cap (vph)	544				784			765				596
v/s Ratio Prot					0.07							
v/s Ratio Perm	c0.27							0.25				0.08
v/c Ratio	0.60				0.16			0.57				0.19
Uniform Delay, d1	19.0				15.0			18.6				15.1
Progression Factor	1.00				1.00			1.00				1.00
Incremental Delay, d2	4.9				0.5			3.0				0.7
Delay (s)	23.9				15.4			21.6				15.8
Level of Service	C				B			C				B
Approach Delay (s)		23.9			15.4			21.6			15.8	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

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Synchro Analysis

PM Mitigated Build (Alternative D) 2025

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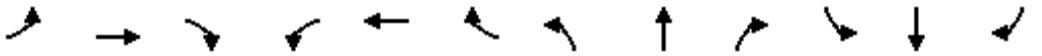

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	0	0	0	122	43	33	71	0	0	0	197
Future Volume (vph)	245	0	0	0	122	43	33	71	0	0	0	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	16	12	12	14	12	12	12	13
Total Lost time (s)	5.0				5.0			5.0				5.0
Lane Util. Factor	1.00				1.00			1.00				1.00
Frt	1.00				0.96			1.00				0.86
Flt Protected	0.95				1.00			0.98				1.00
Satd. Flow (prot)	1741				1761			1748				1474
Flt Permitted	0.62				1.00			0.98				1.00
Satd. Flow (perm)	1132				1761			1748				1474
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.81	0.81	0.81	0.82	0.82	0.82
Adj. Flow (vph)	275	0	0	0	144	51	41	88	0	0	0	240
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	275	0	0	0	195	0	0	129	0	0	0	240
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	1%	1%	1%	2%	2%	2%
Parking (#/hr)	3				2	2	3	3	3		3	3
Turn Type	Perm				NA		Perm	NA				Perm
Protected Phases					8			2				
Permitted Phases	4						2					6
Actuated Green, G (s)	40.0				40.0			40.0				40.0
Effective Green, g (s)	40.0				40.0			40.0				40.0
Actuated g/C Ratio	0.44				0.44			0.44				0.44
Clearance Time (s)	5.0				5.0			5.0				5.0
Lane Grp Cap (vph)	503				782			776				655
v/s Ratio Prot					0.11							
v/s Ratio Perm	c0.24							0.07				c0.16
v/c Ratio	0.55				0.25			0.17				0.37
Uniform Delay, d1	18.3				15.6			15.0				16.6
Progression Factor	1.00				1.00			1.00				1.00
Incremental Delay, d2	4.2				0.8			0.5				1.6
Delay (s)	22.6				16.4			15.5				18.2
Level of Service	C				B			B				B
Approach Delay (s)		22.6			16.4			15.5			18.2	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

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Appendix B: Air Quality

- Stationary On-Site Calculation Sheets
- PM2.5 Emission Calculation Sheets for Mobile Source Analysis

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Stationary On-Site Calculation Sheets

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NYCT Jamaica Bus Depot - Emissions Calculations

Jamaica Bus Depot Emissions Calculations - Alt A

Boilers

Number of Boilers 2
Heat Input: 2 MMBtu/hr/Boiler
Natural Gas HHV: 1020 Btu/ft^3

Annual Operation: 5,112 Hours/Year

	Natural Gas Fuel						
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	(lbs/hr) [1]	(tons/yr)
NOx	50	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0490	lbs/MMBtu	0.20	0.50
CO	84	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0824	lbs/MMBtu	0.33	0.84
PM10	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.03	0.08
PM2.5	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.03	0.08
SO_2	0.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0006	lbs/MMBtu	0.00	0.01
VOC's	5.5	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0054	lbs/MMBtu	0.0216	0.0551

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.01234	0.007710	0.00450
CO	0.02073	0.012953	0.00756
PM10	0.00188	0.001172	0.00068
PM2.5	0.00188	0.001172	0.00068
SO2	0.00015	0.000093	0.00005
VOC's	0.00136	0.000848	0.00049

Pollutant	Max Emissions	Max Emissions (tons/yr)
NOx	0.20	0.5012
CO	0.33	0.8420
PM10	0.03	0.0762
PM2.5	0.03	0.0762
SO_2	0.00	0.0060
VOC's	0.0216	0.0551

Notes: 1. Based on both boilers operating at once

HRU's

Number of HRU's 9
Heat Input: 1.8 MMBtu/hr/Boiler
Natural Gas HHV: 1020 Btu/ft^3

Annual Operation: 5,112 Hours/Year

	Natural Gas Fuel						
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	(lbs/hr) [1]	(tons/yr)
NOx	100	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0980	lbs/MMBtu	1.59	4.06
CO	84	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0824	lbs/MMBtu	1.33	3.41
PM10	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.12	0.31
PM2.5	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.12	0.31
SO_2	0.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0006	lbs/MMBtu	0.01	0.02
VOC's	5.5	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0054	lbs/MMBtu	0.09	0.22

Notes: 1. Based on all HRU's operating at once
HRU ROOF AREA1 (m^2) 612

	HRU FUEL COMBUSTION ONLY				HRU FUEL + Depot Inside				Roof HRU AREA1 (9 units)		
	1hr	24 hour	annual		1hr	24 hour	annual		1hr	24hr	Annual
	g/s	g/s	g/s		g/s	g/s	g/s		(g/s*m^2)	(g/s*m^2)	(g/s*m^2)
NOx	0.19985	0.14989	0.08747	NOx	0.21062	0.15108	0.08852	NOx	3.44E-04	2.47E-04	1.45E-04
CO	0.16788	0.12591	0.07347	CO	0.19719	0.12932	0.07650	CO	3.22E-04	2.11E-04	1.25E-04
PM10	0.01519	0.01139	0.00665	PM10	0.01550	0.01143	0.00668	PM10	2.53E-05	1.87E-05	1.09E-05
PM2.5	0.01519	0.01139	0.00665	PM2.5	0.01547	0.01142	0.00668	PM2.5	2.53E-05	1.87E-05	1.09E-05
SO2	0.00120	0.00090	0.00052	SO_2	0.00120	0.00090	0.00052	SO2	1.96E-06	1.47E-06	8.58E-07
VOC's	0.01099	0.00824	0.00481	VOC's	0.02269	0.00952	0.00594	VOC's	3.71E-05	1.56E-05	9.71E-06

Pollutant	Max Emissions	Max Emissions (tons/yr)
NOx	1.59	4.0595
CO	1.33	3.4100
PM10	0.12	0.3085
PM2.5	0.12	0.3085
SO_2	0.01	0.0244
VOC's	0.0874	0.2233

Notes: 1. Based on all HRU's operating at once

HVAC Units

Number of HRU's 3
Heat Input: 0.55 MMBtu/hr/Boiler
Natural Gas HHV: 1020 Btu/ft^3

Annual Operation: 5,112 Hours/Year

	Natural Gas Fuel						
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	(lbs/hr) [1]	(tons/yr)
NOx	100	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0980	lbs/MMBtu	0.16	0.41
CO	84	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0824	lbs/MMBtu	0.14	0.35
PM10	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.01	0.03
PM2.5	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.01	0.03
SO_2	0.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0006	lbs/MMBtu	0.00	0.00
VOC's	5.5	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0054	lbs/MMBtu	0.01	0.0227

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.02036	0.02036	0.01188
CO	0.01710	0.01710	0.00998
PM10	0.00155	0.00155	0.00090
PM2.5	0.00155	0.00155	0.00090
SO2	0.00012	0.00012	0.00007
VOC's	0.00112	0.00112	0.00065

Total Per HVAC Unit

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.00679	0.00679	0.00396
CO	0.00570	0.00570	0.00333
PM10	0.00052	0.00052	0.00030
PM2.5	0.00052	0.00052	0.00030
SO2	0.00004	0.00004	0.00002
VOC's	0.00037	0.00037	0.00022

Pollutant	Max Emissions	Max Emissions (tons/yr)
NOx	0.16	0.4135
CO	0.14	0.3473
PM10	0.01	0.0314
PM2.5	0.01	0.0314
SO_2	0.00	0.0025
VOC's	0.0089	0.0227

NYCT Jamaica Bus Depot - Emissions Calculations

Notes: 1. Based on all HVAC units operating at once

Hot Water Heater

Number of HRU's 3
Heat Input: 0.6 MMBtu/hr/Boiler
Natural Gas HHV: 1020 Btu/ft^3

Annual Operation: 8,760 Hours/Year

	Natural Gas Fuel						
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	(lbs/hr) [1]	(tons/yr)
NOx	100	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0980	lbs/MMBtu	0.18	0.77
CO	84	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0824	lbs/MMBtu	0.15	0.65
PM10	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.01	0.06
PM2.5	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.01	0.06
SO_2	0.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0006	lbs/MMBtu	0.00	0.00
VOC's	5.5	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0054	lbs/MMBtu	0.01	0.04

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.02221	0.02221	0.01296
CO	0.01865	0.01865	0.01089
PM10	0.00169	0.00169	0.00098
PM2.5	0.00169	0.00169	0.00098
SO2	0.00013	0.00013	0.00008
VOC's	0.00122	0.00122	0.00071

Pollutant	Max Emissions	Max Emissions (tons/yr)
NOx	0.18	0.7729
CO	0.15	0.6493
PM10	0.01	0.0587
PM2.5	0.01	0.0587
SO_2	0.00	0.0046
VOC's	0.0097	0.0425

Notes: 1. Based on all Hot Water units operating at once

Pressure Washers

Type of Fuel: **Natural Gas**

Number of Units 2
Heat Input: 0.35 mmBtu/hr/unit
HHV: 1020 Btu/ft^3
Total Operation 2080 Hours/yr

	Natural Gas						Total Emissions	
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	Basis	(lbs/hr)	(tons/yr)
NOx	100	lb/10^6 scf	AP-42 Table 1.4-1	0.098	lbs/MMBtu	AP-42	0.07	0.07
CO	84	lb/10^6 scf	AP-42 Table 1.4-1	0.082	lbs/MMBtu	AP-42	0.06	0.06
PM10	7.6	lb/10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	AP-42	0.0052	0.01
PM2.5	7.6	lb/10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	AP-42	0.0052	0.01
SO_2	0.6	lb/10^6 scf	AP-42 Table 1.4-2	0.00059	lbs/MMBtu	AP-42	0.0004	0.0004
VOC's	5.5	lb/10^6 scf	AP-42 Table 1.4-2	0.00539	lbs/MMBtu	AP-42	0.0038	0.0039

Notes: 1. Based on both washers operating at once

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.00864	0.00864	0.005039
CO	0.00725	0.00725	0.004233
PM10	0.00066	0.00066	0.000383
PM2.5	0.00066	0.00066	0.000383
SO2	0.00005	0.00005	0.000030
VOC's	0.00047	0.00047	0.000277

NYCT Jamaica Bus Depot - Emissions Calculations

Emergency Generator (1- 250 kW Detroit Diesel Engine)

Type of Fuel: **No.2 Fuel Oil**

Number of Units 1
Heat Input: 2 MMBtu/hr
Total Operation 150 Hours/yr

ASSUMES NO PEAK LOAD SHAVING

No. 2 Fuel Oil					Total Emissions	
Pollutant	Emission Factor	Units	Source	Basis	(lbs/hr)	(tons/yr)
NOx	4.41	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	8.82	0.662
CO	0.95	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	1.90	0.143
PM10	0.31	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	0.62	0.047
PM2.5	0.31	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	0.62	0.047
SO_2	0.202	lbs/MMBtu	AP-42 Table 3.4-1	AP-42	0.40	0.030
VOC's	0.35	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	0.70	0.053

Maintenance Tail Pipe Vehicle Emissions

No. Buses being maintained/yr: 2718 Projected for year 2025
No. Buses being maintained/day: 9
Idling Time per Hour (hours): 1.08

					24 hr period	Annual Period
Pollutant	Idle Emission Factor	Units	Source	Basis	(lbs/hr)	(tons/yr)
NOx	7.23	g/veh-hr	MOVES 2014		0.007	0.023
CO	18.33	g/veh-hr	MOVES 2014		0.017	0.059
PM10	0.20	g/veh-hr	EPA Tier IV		0.0002	0.0007
PM2.5	0.19	g/veh-hr	EPA Tier IV		0.0002	0.0006
SO_2	0.00	g/veh-hr	MOVES 2014		0.000	0.000
VOC's	7.94	g/veh-hr	MOVES 2014		0.007	0.026

	Total Tailpipe Emisison		Per Tail Pipe Emission	
	short term	Annual	short term	Annual
	(g/s)	(g/s)	(g/s)	(g/s)
NOx	0.00085	0.001	1.71E-04	1.35E-04
CO	0.00217	0.002	4.34E-04	3.41E-04
PM10	0.00002	0.000	4.84E-06	3.81E-06
PM2.5	0.00002	0.000	4.46E-06	3.51E-06
SO_2	0.00000	0.000	0.00E+00	0.00E+00
VOC's	0.00094	0.001	1.88E-04	1.48E-04

Emissions (tons/yr)= Emission Factor(g/hr)* (1.08hours/bus)*(number of buses maintaned per year)* (1 lbs/435.6 g)* (1tons/2000 lbs)
Assume PM10/PM2.5 emissions are controlled by DPFs with a 90% control efficiency.

Bus Movements (Onsite Mobile Emissions Inside the Building)

Daily No. of Buses In: 271 195 spaces top floor Peak hour in- 18 or 57 per level
Daily No. of Buses Out: 271 102 Peak hour out- 96
Total No. of Buse Movement: 542
Travel Distance (m):
Travel Distance (mile): 0.09
Yard Line up Travel Distance Only
(mile): 18 Buses Only 3.768
Idling Time per Hour (min): 5
Cruising Hour/Day: 1
Idling Time per Day: 3 *from old jbd calc*

	Cruising					Idling					Total
Pollutant	Emission Factor	Units	Source	(lbs/hr)	(tons/yr)	Emission Factor	Units	Source	(lbs/hr)	(tons/yr)	(tons/yr)
NOx	2.71	g/veh-mile	MOVES 2014	0.278	0.051	7.23	g/veh-hr	MOVES 20	0.360	0.197	0.248
CO	11.30	g/veh-mile	MOVES 2014	1.160	0.212	18.33	g/veh-hr	MOVES 20	0.914	0.500	0.712
PM10	0.09	g/veh-mile	EPA Tier IV	0.009	0.002	0.20	g/veh-hr	EPA Tier IV	0.010	0.006	0.007
PM2.5	0.08	g/veh-mile	EPA Tier IV	0.008	0.002	0.19	g/veh-hr	EPA Tier IV	0.009	0.005	0.007
SO_2	0.00	g/veh-mile	MOVES 2014	0.000	0.000	0.00	g/veh-hr	MOVES 20	0.000	0.000	0.000
VOC's	2.69	g/veh-mile	MOVES 2014	0.276	0.050	7.94	g/veh-hr	MOVES 20	0.396	0.217	0.267

CRUISE

1 hr	4 short term	Annual
(g/s)	(g/s)	(g/s)
0.0012	0.0002	0.0002
0.0051	0.0010	0.0009
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0012	0.0002	0.0002

IDLE

1 hr	short ter	Annual
(g/s)	(g/s)	(g/s)
0.0095	0.0009	0.0008
0.0242	0.0024	0.0021
0.0003	0.0000	0.0000
0.0002	0.0000	0.0000
0.0000	0.0000	0.0000
0.0105	0.0010	0.0009

Total

	1 hr	4 short term	Annual
	(g/s)	(g/s)	(g/s)
NOx	0.0108	0.0012	0.0011
CO	0.0293	0.0034	0.0030
PM10	0.0003	0.0000	0.0000
PM2.5	0.0003	0.0000	0.0000
SO_2	0.0000	0.0000	0.0000
VOC's	0.0117	0.0013	0.0011

NYCT Jamaica Bus Depot - Emissions Calculations

Bus Movements (Onsite Mobile Emissions Outside of the Building)

No. of Buses In:	271	195 spaces top floor	Peak hour in-	18	or	57	per level
No. of Buses Out:	271	102	Peak hour out-	96			
Total No. of Buse Movement:	542						
Travel Distance (m):							
Travel Distance (mile):	0.47						
Idling Time per Hour (min):	5						
Cruising Hour/Day:	1						
Idling Time per Day:	1						

	Cruising					Idling					Total
Pollutant	Emission Factor	Units	Source	(lbs/hr)	(tons/yr)	Emission Factor	Units	Source	(lbs/hr)	(tons/yr)	(tons/yr)
NOx	2.71	g/veh-mile	MOVES 2014	0.278	0.051	7.23	g/veh-hr	MOVES 20	0.360	0.197	0.248
CO	11.30	g/veh-mile	MOVES 2014	1.160	0.212	18.33	g/veh-hr	MOVES 20	0.914	0.500	0.712
PM10	0.09	g/veh-mile	MOVES 2014	0.009	0.002	0.20	g/veh-hr	MOVES 20	0.010	0.006	0.007
PM2.5	0.08	g/veh-mile	MOVES 2014	0.008	0.002	0.19	g/veh-hr	MOVES 20	0.009	0.005	0.007
SO_2	0.00	g/veh-mile	MOVES 2014	0.000	0.000	0.00	g/veh-hr	MOVES 20	0.000	0.000	0.000
VOC's	2.69	g/veh-mile	MOVES 2014	0.276	0.050	7.94	g/veh-hr	MOVES 20	0.396	0.217	0.267

Assume PM10/PM2.5 emissions are controlled by DPFs with a 90% control efficiency.

Ground Level AREA (m^2)	10696.00
Ground Level AREA (m^2)	7486.00
Buses Entering Depot	100.00
Assume bus exhaust l sat 3.35 meters	
Air Xchg per Hour (4-8 as per NYCT)	6

CRUISE

1 hr	4 short term	Annual
(g/s)	(g/s)	(g/s)
0.0406	0.008	0.0071
0.1697	0.034	0.0298
0.0014	0.000	0.0002
0.0012	0.000	0.0002
0.0000	0.000	0.0000
0.0404	0.008	0.0071

IDLE

1 hr	short ter	Annual	
(g/s)	(g/s)	(g/s)	
0.0191	0.002	0.0017	NOx
0.0484	0.005	0.0042	CO
0.0005	0.000	0.0000	PM10
0.0005	0.000	0.0000	PM2.5
0.0000	0.000	0.0000	SO2
0.0210	0.002	0.0018	VOC's

Total

1 hr	4 short terr	Annual	Ground Level 1Hr	Ground Level 24hr	Ground Level Annual	Rooftop 1Hr	Rooftop 24hr	Rooftop Annual
(g/s)	(g/s)	(g/s)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)
0.0597	0.0099	0.0088	5.58E-06	9.29E-07	8.23E-07	7.98E-06	1.33E-06	1.18E-06
0.2181	0.0384	0.0340	2.04E-05	3.59E-06	3.18E-06	2.91E-05	5.13E-06	4.55E-06
0.0019	0.0003	0.0003	1.77E-07	3.00E-08	2.66E-08	2.53E-07	4.29E-08	3.80E-08
0.0017	0.0003	0.0003	1.63E-07	2.76E-08	2.45E-08	2.32E-07	3.95E-08	3.50E-08
0.0000	0.0000	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.0613	0.0101	0.0089	5.74E-06	9.42E-07	8.35E-07	8.19E-06	1.35E-06	1.19E-06

CRUISE

1 hr	4 short term	Annual
(g/s)	(g/s)	(g/s)
0.0064	0.008	0.0071
0.0268	0.034	0.0298
0.0002	0.000	0.0002
0.0002	0.000	0.0002
0.0000	0.000	0.0000
0.0064	0.008	0.0071

IDLE

1 hr	short te	Annual	
(g/s)	(g/s)	(g/s)	
0.0000	0.000	0.0000	NOx
0.0000	0.000	0.0000	CO
0.0000	0.000	0.0000	PM10
0.0000	0.000	0.0000	PM2.5
0.0000	0.000	0.0000	SO2
0.0000	0.000	0.0000	VOC's

Total

1 hr	4 short terr	Annual	Buses Entering Depot 1Hr	Buses Entering Depot 24hr	Buses Entering Depot Annual	Rooftop 1Hr	Rooftop 24hr	Rooftop Annual
(g/s)	(g/s)	(g/s)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)
0.0064	0.0081	0.0071	6.42E-05	8.05E-05	7.13E-05	8.57E-07	1.08E-06	9.53E-07
0.0268	0.0336	0.0298	2.68E-04	3.36E-04	2.98E-04	3.58E-06	4.49E-06	3.98E-06
0.0002	0.0003	0.0002	2.13E-06	2.68E-06	2.37E-06	2.85E-08	3.57E-08	3.17E-08
0.0002	0.0002	0.0002	1.96E-06	2.46E-06	2.18E-06	2.62E-08	3.29E-08	2.91E-08
0.0000	0.0000	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.0064	0.0080	0.0071	6.38E-05	8.00E-05	7.09E-05	8.52E-07	1.07E-06	9.47E-07

Safety-Kleen Parts Washer Emissions

Washers service interval: Every 4 weeks
Total number of washers: 3 -model #30

Pollutant	Average Emission Factor	Units	Source	(tons/yr)
VOC's	51	gal/yr	Safety-Kleen	0.497

Emissions (tons/yr)= Emission Factor of washers (gal/yr)* (6.5 lbs/gal)*(total number of washers)* (1tons/2000 lbs)

Total Facility Emissions

Pollutants	Total Facility Emissions (Tons/year)	Major Source Threshold (Tons/Year)	Cap by rule Threshold (Tons/Year)	TOTAL FACILITY EMISSIONS (tons/yr)
NOx		25	12.5	6.75
CO		100	50	6.22
PM10		100	50	0.53
PM2.5		100	50	0.53
SO_2		100	50	0.07
VOC's		25	12.5	1.19

Pollutants	Estimated Facility Emissions (Tons/year)	Major Source Threshold (Tons/Year)
NOx	6.8	25
CO	6.2	100
PM10	0.5	100
PM2.5	0.5	100
SO_2	0.1	100
VOC's	1.2	25

NYCT Jamaica Bus Depot - Emissions Calculations

Jamaica Bus Depot Emissions Calculations - Alt B

Boilers

Number of Boilers 2
Heat Input: 2 MMBtu/hr/Boiler
Natural Gas HHV: 1020 Btu/ft^3

Annual Operation: 5,112 Hours/Year

	Natural Gas Fuel						
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	(lbs/hr) [1]	(tons/yr)
NOx	50	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0490	lbs/MMBtu	0.20	0.50
CO	84	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0824	lbs/MMBtu	0.33	0.84
PM10	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.03	0.08
PM2.5	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.03	0.08
SO_2	0.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0006	lbs/MMBtu	0.00	0.01
VOC's	5.5	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0054	lbs/MMBtu	0.0216	0.0551

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.01234	0.007710	0.00450
CO	0.02073	0.012953	0.00756
PM10	0.00188	0.001172	0.00068
PM2.5	0.00188	0.001172	0.00068
SO2	0.00015	0.000093	0.00005
VOC's	0.00136	0.000848	0.00049

Pollutant	Max Emissions	Max Emissions (tons/yr)
NOx	0.20	0.5012
CO	0.33	0.8420
PM10	0.03	0.0762
PM2.5	0.03	0.0762
SO_2	0.00	0.0060
VOC's	0.0216	0.0551

Notes: 1. Based on both boilers operating at once

HRU's

Number of HRU's 15
Heat Input: 1.8 MMBtu/hr/Boiler
Natural Gas HHV: 1020 Btu/ft^3

Annual Operation: 5,112 Hours/Year

	Natural Gas Fuel						
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	(lbs/hr) [1]	(tons/yr)
NOx	100	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0980	lbs/MMBtu	2.65	6.77
CO	84	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0824	lbs/MMBtu	2.22	5.68
PM10	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.20	0.51
PM2.5	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.20	0.51
SO_2	0.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0006	lbs/MMBtu	0.02	0.04
VOC's	5.5	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0054	lbs/MMBtu	0.15	0.37

Notes: 1. Based on all HRU's operating at once
HRU ROOF AREA1 (m^2) 1083
HRU ROOF AREA2 (m^2) 246

	HRU FUEL COMBUSTION ONLY				HRU FUEL + Depot Inside Exhaust CONTRIBUTION		
	1hr	24 hour	annual		1hr	24 hour	annual
	g/s	g/s	g/s		g/s	g/s	g/s
NOx	0.33309	0.249816	0.14578	NOx	0.35337	0.25289	0.14850
CO	0.27979	0.209846	0.12246	CO	0.34883	0.22113	0.13245
PM10	0.02531	0.018986	0.01108	PM10	0.02594	0.01908	0.01117
PM2.5	0.02531	0.018986	0.01108	PM2.5	0.02589	0.01908	0.01116
SO2	0.00200	0.001499	0.00087	SO_2	0.00200	0.00150	0.00087
VOC's	0.01832	0.013740	0.00802	VOC's	0.03947	0.01689	0.01081

	Roof HRU AREA1 (12 units)			Roof HRU AREA2 (3 units)		
	1hr	24hr	Annual	1hr	24hr	Annual
	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)
NOx	2.61E-04	1.87E-04	1.10E-04	2.87E-04	2.06E-04	1.21E-04
CO	2.58E-04	1.63E-04	9.78E-05	2.84E-04	1.80E-04	1.08E-04
PM10	1.92E-05	1.41E-05	8.25E-06	2.11E-05	1.55E-05	9.08E-06
PM2.5	1.91E-05	1.41E-05	8.24E-06	2.11E-05	1.55E-05	9.07E-06
SO2	1.48E-06	1.11E-06	6.46E-07	1.62E-06	1.22E-06	7.11E-07
VOC's	2.916E-05	1.248E-05	7.986E-06	3.209E-05	1.373E-05	8.789E-06

HRU emissions (g/s*m^2)

	Roof HRU per unit		
	1hr	24hr	Annual
	g/s	g/s	g/s
NOx	2.36E-02	1.69E-02	9.90E-03
CO	2.33E-02	1.47E-02	8.83E-03
PM10	1.73E-03	1.27E-03	7.44E-04
PM2.5	1.73E-03	1.27E-03	7.44E-04
SO2	1.33E-04	9.99E-05	5.83E-05
VOC's	2.63E-03	1.13E-03	7.21E-04

HRU emissions (g/s)

Pollutant	Max Emissions	Max Emissions (tons/yr)
NOx	2.65	6.7659
CO	2.22	5.6833
PM10	0.20	0.5142
PM2.5	0.20	0.5142
SO_2	0.02	0.0406
VOC's	0.1456	0.3721

HVAC Units

Number of HRU's 3
Heat Input: 0.55 MMBtu/hr/Boiler
Natural Gas HHV: 1020 Btu/ft^3

Annual Operation: 5,112 Hours/Year

	Natural Gas Fuel						
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	(lbs/hr) [1]	(tons/yr)
NOx	100	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0980	lbs/MMBtu	0.16	0.41
CO	84	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0824	lbs/MMBtu	0.14	0.35
PM10	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.01	0.03
PM2.5	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.01	0.03
SO_2	0.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0006	lbs/MMBtu	0.00	0.00
VOC's	5.5	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0054	lbs/MMBtu	0.01	0.0227

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.02036	0.02036	0.0119
CO	0.01710	0.01710	0.0100
PM10	0.00155	0.00155	0.0009
PM2.5	0.00155	0.00155	0.0009
SO2	0.00012	0.00012	0.0001
VOC's	0.00112	0.00112	0.0007

Total Per HVAC Unit

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.00679	0.00679	0.00396
CO	0.00570	0.00570	0.00333
PM10	0.00052	0.00052	0.00030
PM2.5	0.00052	0.00052	0.00030
SO2	0.00004	0.00004	0.00002
VOC's	0.00037	0.00037	0.00022

Pollutant	Max Emissions	Max Emissions (tons/yr)
NOx	0.16	0.4135
CO	0.14	0.3473
PM10	0.01	0.0314
PM2.5	0.01	0.0314
SO_2	0.00	0.0025

VOC's	0.0089	0.0227

Notes: 1. Based on all HVAC units operating at once

Hot Water Heater

Number of HRU's 3
Heat Input: 0.6 MMBtu/hr/Boiler
Natural Gas HHV: 1020 Btu/ft^3

Annual Operation: 8,760 Hours/Year

	Natural Gas Fuel						
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	(lbs/hr) [1]	(tons/yr)
NOx	100	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0980	lbs/MMBtu	0.18	0.77
CO	84	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0824	lbs/MMBtu	0.15	0.65
PM10	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.01	0.06
PM2.5	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.01	0.06
SO_2	0.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0006	lbs/MMBtu	0.00	0.00
VOC's	5.5	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0054	lbs/MMBtu	0.01	0.04

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.02221	0.02221	0.0130
CO	0.01865	0.01865	0.0109
PM10	0.00169	0.00169	0.0010
PM2.5	0.00169	0.00169	0.0010
SO2	0.00013	0.00013	0.0001
VOC's	0.00122	0.00122	0.0007

Pollutant	Max Emissions	Max Emissions (tons/yr)
NOx	0.18	0.7729
CO	0.15	0.6493
PM10	0.01	0.0587
PM2.5	0.01	0.0587
SO_2	0.00	0.0046
VOC's	0.0097	0.0425

Notes: 1. Based on all Hot Water units operating at once

Pressure Washers

Type of Fuel: **Natural Gas**

Number of Units 2
Heat Input: 0.35 mmBtu/hr/unit
HHV: 1020 Btu/ft^3
Total Operation 2080 Hours/yr

	Natural Gas						Total Emissions	
Pollutant	Emission Factor	Units	Source	Emission Fac	Units	Basis	(lbs/hr)	(tons/yr)
NOx	100	lb/10^6 scf	AP-42 Table 1.4-1	0.098	lbs/MMBtu	AP-42	0.07	0.07
CO	84	lb/10^6 scf	AP-42 Table 1.4-1	0.082	lbs/MMBtu	AP-42	0.06	0.06
PM10	7.6	lb/10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	AP-42	0.0052	0.01
PM2.5	7.6	lb/10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	AP-42	0.0052	0.01
SO_2	0.6	lb/10^6 scf	AP-42 Table 1.4-2	0.00059	lbs/MMBtu	AP-42	0.0004	0.0004
VOC's	5.5	lb/10^6 scf	AP-42 Table 1.4-2	0.00539	lbs/MMBtu	AP-42	0.0038	0.0039

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.00864	0.00864	0.0050
CO	0.00725	0.00725	0.0042
PM10	0.00066	0.00066	0.0004
PM2.5	0.00066	0.00066	0.0004
SO2	0.00005	0.00005	0.0000
VOC's	0.00047	0.00047	0.0003

Notes: 1. Based on both washers operating at once

NYCT Jamaica Bus Depot - Emissions Calculations

Emergency Generator (1- 250 kW Detroit Diesel Engine)

Type of Fuel: **No.2 Fuel Oil**

Number of Units 1
Heat Input: 2 MMBtu/hr
Total Operation 150 Hours/yr

No. 2 Fuel Oil					Total Emissions	
Pollutant	Emission Factor	Units	Source	Basis	(lbs/hr)	(tons/yr)
NOx	4.41	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	8.82	0.662
CO	0.95	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	1.90	0.143
PM10	0.31	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	0.62	0.047
PM2.5	0.31	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	0.62	0.047
SO_2	0.202	lbs/MMBtu	AP-42 Table 3.4-1	AP-42	0.40	0.030
VOC's	0.35	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	0.70	0.053

ASSUMES NO PEAK LOAD SHAVING

Maintenance Tail Pipe Vehicle Emissions

No. Buses being maintained/yr: 2718 Projected for year 2025
No. Buses being maintained/day: 9
Idling Time per Hour (hours): 1.08

					24 hr period	Annual Period
Pollutant	Idle Emission Factor	Units	Source	Basis	(lbs/hr)	(tons/yr)
NOx	7.23	g/veh-hr	MOVES 2014		0.007	0.023
CO	18.33	g/veh-hr	MOVES 2014		0.017	0.059
PM10	0.20	g/veh-hr	EPA Tier IV		0.0002	0.0007
PM2.5	0.19	g/veh-hr	EPA Tier IV		0.0002	0.0006
SO_2	0.00	g/veh-hr	MOVES 2014		0.000	0.000
VOC's	7.94	g/veh-hr	MOVES 2014		0.007	0.026

	Total Tailpipe Emisisons		**Per Tail Pipe Emissions**	
	short term	Annual	short term	Annual
	(g/s)	(g/s)	(g/s)	(g/s)
NOx	8.55E-04	6.73E-04	1.71E-04	1.35E-04
CO	2.17E-03	1.71E-03	4.34E-04	3.41E-04
PM10	2.42E-05	1.91E-05	4.84E-06	3.81E-06
PM2.5	2.23E-05	1.75E-05	4.46E-06	3.51E-06
SO2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VOC's	9.39E-04	7.39E-04	1.88E-04	1.48E-04

Emissions (tons/yr)= Emission Factor(g/hr)* (1.08hours/bus)*(number of buses maintaned per year)* (1 lbs/435.6 g)* (1tons/2000 lbs)
Assume PM10/PM2.5 emissions are controlled by DPFs with a 90% control efficiency.

Bus Movements (Onsite Mobile Emissions Inside the Building)

Daily No. of Buses In: 271 195 spaces top floor Peak hour in- 18 or 57 per level
Daily No. of Buses Out: 271 102 Peak hour out- 96
Total No. of Buse Movement: 542
Travel Distance (m):
Travel Distance (mile): 0.75
Yard Line up Travel Distance Only
(mile): 18 Buses Only 3.768
Idling Time per Hour (min): 5
Cruising Hour/Day: 1
Idling Time per Day: 3 *from old jbd calc*

	Cruising					Idling					Total
Pollutant	Emission Factor	Units	Source	(lbs/hr)	(tons/yr)	Emission Factor	Units	Source	(lbs/hr)	(tons/yr)	(tons/yr)
NOx	2.71	g/veh-mile	MOVES 2014	2.434	0.444	7.23	g/veh-hr	MOVES 2014	0.360	0.197	0.642
CO	11.30	g/veh-mile	MOVES 2014	10.166	1.855	18.33	g/veh-hr	MOVES 2014	0.914	0.500	2.356
PM10	0.09	g/veh-mile	MOVES 2015	0.081	0.015	0.20	g/veh-hr	EPA Tier IV	0.010	0.006	0.020
PM2.5	0.08	g/veh-mile	MOVES 2016	0.074	0.014	0.19	g/veh-hr	EPA Tier IV	0.009	0.005	0.019
SO_2	0.00	g/veh-mile	MOVES 2014	0.000	0.000	0.00	g/veh-hr	MOVES 2014	0.000	0.000	0.000
VOC's	2.69	g/veh-mile	MOVES 2014	2.419	0.442	7.94	g/veh-hr	MOVES 2014	0.396	0.217	0.658

CRUISE				**IDLE**				**Total**		
1 hr	short term	Annual		1 hr	short term	Annual		1 hr	short term	Annual
(g/s)	(g/s)	(g/s)		(g/s)	(g/s)	(g/s)		(g/s)	(g/s)	(g/s)
0.0107	0.0021	0.0019	NOx	0.0095	0.0009	0.0008	NOx	0.0203	0.0031	0.0027
0.0448	0.0089	0.0079	CO	0.0242	0.0024	0.0021	CO	0.0690	0.0113	0.0100
0.0004	0.0001	0.0001	PM10	0.0003	0.0000	0.0000	PM10	0.0006	0.0001	0.0001
0.0003	0.0001	0.0001	PM2.5	0.0002	0.0000	0.0000	PM2.5	0.0006	0.0001	0.0001
0.0000	0.0000	0.0000	SO_2	0.0000	0.0000	0.0000	SO_2	0.0000	0.0000	0.0000
0.0107	0.0021	0.0019	VOC's	0.0105	0.0010	0.0009	VOC's	0.0212	0.0032	0.0028

NYCT Jamaica Bus Depot - Emissions Calculations

Bus Movements (Onsite Mobile Emissions Outside of the Building)

No. of Buses In: 271 195 spaces top floor Peak hour in- 18 or 57 per level
No. of Buses Out: 271 102 Peak hour out- 96
Total No. of Buse Movement: 542
Travel Distance (m):
Travel Distance (mile): 0.20
Idling Time per Hour (min): 5
Cruising Hour/Day: 1

Idling Time per Day: 1

	Cruising					Idling					Total
Pollutant	Emission Factor	Units	Source	(lbs/hr)	(tons/yr)	Emission Factor	Units	Source	(lbs/hr)	(tons/yr)	(tons/yr)
NOx	2.71	g/veh-mile	MOVES 2014	2.434	0.444	7.23	g/veh-hr	MOVES 2014	0.360	0.197	0.642
CO	11.30	g/veh-mile	MOVES 2014	10.166	1.855	18.33	g/veh-hr	MOVES 2014	0.914	0.500	2.356
PM10	0.09	g/veh-mile	MOVES 2014	0.081	0.015	0.20	g/veh-hr	MOVES 2014	0.010	0.006	0.020
PM2.5	0.08	g/veh-mile	MOVES 2014	0.074	0.014	0.19	g/veh-hr	MOVES 2014	0.009	0.005	0.019
SO_2	0.00	g/veh-mile	MOVES 2014	0.000	0.000	0.00	g/veh-hr	MOVES 2014	0.000	0.000	0.000
VOC's	2.69	g/veh-mile	MOVES 2014	2.419	0.442	7.94	g/veh-hr	MOVES 2014	0.396	0.217	0.658

Assume PM10/PM2.5 emissions are controlled by DPFs with a 90% control efficiency.
Ground Level AREA (m^2) 2024.719
ROOF AREA (m^2) 5987.516
Assume bus exhaust I sat 3.35 meters
Air Xchg per Hour (4-8 as per NYCT) 6

CRUISE				IDLE				Total				Ground Area			Rooftop Area		
1 hr	short term	Annual		1 hr	short term	Annual		1 hr	short term	Annual		1Hr	24hr	Annual	1Hr	24hr	Annual
(g/s)	(g/s)	(g/s)		(g/s)	(g/s)	(g/s)		(g/s)	(g/s)	(g/s)		(g/s/m^2)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)
0.0175	0.003	0.0031		0.0191	0.002	0.0017	NOx	0.0366	0.0054	0.0047		1.807E-05	2.647E-06	2.345E-06	6.11E-06	8.95E-07	7.93E-07
0.0732	0.014	0.0128		0.0484	0.005	0.0042	CO	0.1215	0.0193	0.0171		6.003E-05	9.524E-06	8.439E-06	2.03E-05	3.22E-06	2.85E-06
0.0006	0.000	0.0001		0.0005	0.000	0.0000	PM10	0.0011	0.0002	0.0001		5.544E-07	8.34E-08	7.389E-08	1.87E-07	2.82E-08	2.50E-08
0.0005	0.000	0.0001		0.0005	0.000	0.0000	PM2.5	0.0010	0.0002	0.0001		5.101E-07	7.673E-08	6.798E-08	1.72E-07	2.59E-08	2.30E-08
0.0000	0.000	0.0000		0.0000	0.000	0.0000	SO2	0.0000	0.0000	0.0000		0	0	0	0.00E+00	0.00E+00	0.00E+00
0.0174	0.003	0.0031		0.0210	0.002	0.0018	VOC's	0.0384	0.0055	0.0049		1.895E-05	2.729E-06	2.418E-06	6.41E-06	9.23E-07	8.18E-07

CRUISE				IDLE				Total				Ground Area			Rooftop Area		
1 hr	short term	Annual		1 hr	short term	Annual		1 hr	short term	Annual		1Hr	24hr	Annual	1Hr	24hr	Annual
(g/s)	(g/s)	(g/s)		(g/s)	(g/s)	(g/s)		(g/s)	(g/s)	(g/s)		(g/s/m^2)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)	(g/s/m^2)
0.0028	0.003	0.0031		0.0000	0.000	0.0000	NOx	0.0028	0.0035	0.0031		1.37E-06	1.71E-06	1.52E-06	4.619E-07	5.795E-07	5.135E-07
0.0116	0.014	0.0128		0.0000	0.000	0.0000	CO	0.0116	0.0145	0.0128		5.70E-06	7.16E-06	6.34E-06	1.929E-06	2.42E-06	2.144E-06
0.0001	0.000	0.0001		0.0000	0.000	0.0000	PM10	0.0001	0.0001	0.0001		4.54E-08	5.70E-08	5.05E-08	1.535E-08	1.926E-08	1.707E-08
0.0001	0.000	0.0001		0.0000	0.000	0.0000	PM2.5	0.0001	0.0001	0.0001		4.18E-08	5.24E-08	4.64E-08	1.412E-08	1.772E-08	1.57E-08
0.0000	0.000	0.0000		0.0000	0.000	0.0000	SO2	0.0000	0.0000	0.0000		0.00E+00	0.00E+00	0.00E+00	0	0	0
0.0027	0.003	0.0031		0.0000	0.000	0.0000	VOC's	0.0027	0.0034	0.0031		1.36E-06	1.70E-06	1.51E-06	4.59E-07	5.759E-07	5.103E-07

Safety-Kleen Parts Washer Emissions

Washers service interval: Every 4 weeks
Total number of washers: 3 -model #30

Pollutant	Average Emission Factor	Units	Source	(tons/yr)
VOC's	51	gal/yr	Safety-Kleen	0.497

Emissions (tons/yr)= Emission Factor of washers (gal/yr)* (6.5 lbs/gal)*(total number of washers)* (1tons/2000 lbs)

Total Facility Emissions

Pollutants	Total Facility Emissions (Tons/year)	Major Source Threshold (Tons/Year)	Cap by rule Threshold (Tons/Year)	TOTAL FACILITY EMISSIONS (tons/yr)
NOx		25	12.5	9.8513
CO		100	50	10.1395
PM10		100	50	0.7535
PM2.5		100	50	0.7518
SO_2		100	50	0.0845
VOC's		25	12.5	1.7300

Pollutants	Estimated Facility Emissions (Tons/year)	Major Source Threshold (Tons/Year)
NOx	9.9	25
CO	10.1	100
PM10	0.8	100
PM2.5	0.8	100
SO_2	0.1	100
VOC's	1.7	25

NYCT Jamaica Bus Depot - Emissions Calculations

Jamaica Bus Depot Emissions Calculations - Alt D

Boilers

Number of Boilers 2
Heat Input: 2 MMBtu/hr/Boiler
Natural Gas HHV: 1020 Btu/ft^3

Annual Operation: 5,112 Hours/Year

	Natural Gas Fuel						
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	(lbs/hr) [1]	(tons/yr)
NOx	50	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0490	lbs/MMBtu	0.20	0.50
CO	84	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0824	lbs/MMBtu	0.33	0.84
PM10	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.03	0.08
PM2.5	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.03	0.08
SO_2	0.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0006	lbs/MMBtu	0.00	0.01
VOC's	5.5	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0054	lbs/MMBtu	0.0216	0.0551

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.01234	0.007710	0.00450
CO	0.02073	0.012953	0.00756
PM10	0.00188	0.001172	0.00068
PM2.5	0.00188	0.001172	0.00068
SO2	0.00015	0.000093	0.00005
VOC's	0.00136	0.000848	0.00049

Pollutant	Max Emissions	Max Emissions (tons/yr)
NOx	0.20	0.5012
CO	0.33	0.8420
PM10	0.03	0.0762
PM2.5	0.03	0.0762
SO_2	0.00	0.0060
VOC's	0.0216	0.0551

Notes: 1. Based on both boilers operating at once

HRU's

Number of HRU's 19
Heat Input: 1.8 MMBtu/hr/Boiler
Natural Gas HHV: 1020 Btu/ft^3

Annual Operation: 5,112 Hours/Year

	Natural Gas Fuel						
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	(lbs/hr) [1]	(tons/yr)
NOx	100	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0980	lbs/MMBtu	3.35	8.57
CO	84	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0824	lbs/MMBtu	2.82	7.20
PM10	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.25	0.65
PM2.5	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.25	0.65
SO_2	0.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0006	lbs/MMBtu	0.02	0.05
VOC's	5.5	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0054	lbs/MMBtu	0.18	0.47

Notes: 1. Based on all HRU's operating at once
HRU ROOF AREA1 (m^2) 697
HRU ROOF AREA2&3 (m^2) 633
HRU ROOF AREA4 (m^2) 863

HRU FUEL COMBUSTION ONLY

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.42191	0.316434	0.18466
CO	0.35441	0.265804	0.15511
PM10	0.03207	0.024049	0.01403
PM2.5	0.03207	0.024049	0.01403
SO2	0.00253	0.001899	0.00111
VOC's	0.02321	0.017404	0.01016

Total HRU FUEL + Depot Inside

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.44195	0.31946	0.18734
CO	0.42246	0.27689	0.16494
PM10	0.03268	0.02414	0.01412
PM2.5	0.03264	0.02414	0.01411
SO2	0.00253	0.00190	0.00111
VOC's	0.04412	0.02051	0.01291

	Roof HRU AREA1 (9 units)			Roof HRU AREA2&3 (3 units)			Roof HRU AREA4 (4 units)		
	1hr	24hr	Annual	1hr	24hr	Annual	1hr	24hr	Annual
	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)	(g/s*m^2)
NOx	3.00E-04	2.17E-04	1.27E-04	1.10E-04	7.97E-05	4.67E-05	1.47E-04	1.06E-04	6.23E-05
CO	2.87E-04	1.88E-04	1.12E-04	1.05E-04	6.91E-05	4.11E-05	1.41E-04	9.21E-05	5.49E-05
PM10	2.22E-05	1.64E-05	9.60E-06	8.15E-06	6.02E-06	3.52E-06	1.09E-05	8.03E-06	4.70E-06
PM2.5	2.22E-05	1.64E-05	9.59E-06	8.14E-06	6.02E-06	3.52E-06	1.09E-05	8.03E-06	4.69E-06
SO2	1.72E-06	1.29E-06	7.53E-07	6.31E-07	4.74E-07	2.76E-07	8.42E-07	6.31E-07	3.68E-07
VOC's	3.00E-05	1.39E-05	8.77E-06	1.10E-05	5.12E-06	3.22E-06	1.47E-05	6.82E-06	4.29E-06

Pollutant	Max Emissions	Max Emissions (tons/yr)
NOx	3.35	8.5701
CO	2.82	7.1989
PM10	0.25	0.6513
PM2.5	0.25	0.6513
SO_2	0.02	0.0514
VOC's	0.1844	0.4714

Notes: 1. Based on all HRU's operating at once

HVAC Units

Number of HRU's 3
Heat Input: 0.55 MMBtu/hr/Boiler
Natural Gas HHV: 1020 Btu/ft^3

Annual Operation: 5,112 Hours/Year

	Natural Gas Fuel						
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	(lbs/hr) [1]	(tons/yr)
NOx	100	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0980	lbs/MMBtu	0.16	0.41
CO	84	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0824	lbs/MMBtu	0.14	0.35
PM10	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.01	0.03
PM2.5	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.01	0.03
SO_2	0.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0006	lbs/MMBtu	0.00	0.00
VOC's	5.5	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0054	lbs/MMBtu	0.01	0.0227

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.02036	0.02036	0.0118786
CO	0.01710	0.01710	0.009978
PM10	0.00155	0.00155	0.0009028
PM2.5	0.00155	0.00155	0.0009028
SO2	0.00012	0.00012	7.127E-05
VOC's	0.00112	0.00112	0.0006533

Total Per HVAC Unit

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.00679	0.00679	0.00396
CO	0.00570	0.00570	0.00333
PM10	0.00052	0.00052	0.00030
PM2.5	0.00052	0.00052	0.00030
SO2	0.00004	0.00004	0.00002
VOC's	0.00037	0.00037	0.00022

Pollutant	Max Emissions	Max Emissions (tons/yr)
NOx	0.16	0.4135
CO	0.14	0.3473
PM10	0.01	0.0314
PM2.5	0.01	0.0314
SO_2	0.00	0.0025
VOC's	0.0089	0.0227

Notes: 1. Based on all HVAC units operating at once

Hot Water Heater

NYCT Jamaica Bus Depot - Emissions Calculations

Number of HRU's 3
Heat Input: 0.6 MMBtu/hr/Boiler
Natural Gas HHV: 1020 Btu/ft^3

Annual Operation: 8,760 Hours/Year

	Natural Gas Fuel						
Pollutant	Emission Factor	Units	Source	Emission Factor	Units	(lbs/hr) [1]	(tons/yr)
NOx	100	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0980	lbs/MMBtu	0.18	0.77
CO	84	lbs/ 10^6 scf	AP-42 Table 1.4-1	0.0824	lbs/MMBtu	0.15	0.65
PM10	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.01	0.06
PM2.5	7.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	0.01	0.06
SO_2	0.6	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0006	lbs/MMBtu	0.00	0.00
VOC's	5.5	lbs/ 10^6 scf	AP-42 Table 1.4-2	0.0054	lbs/MMBtu	0.01	0.04

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.02221	0.02221	0.0129585
CO	0.01865	0.01865	0.0108851
PM10	0.00169	0.00169	0.0009848
PM2.5	0.00169	0.00169	0.0009848
SO2	0.00013	0.00013	7.775E-05
VOC's	0.00122	0.00122	0.0007127

Pollutant	Max Emissions	Max Emissions (tons/yr)
NOx	0.18	0.7729
CO	0.15	0.6493
PM10	0.01	0.0587
PM2.5	0.01	0.0587
SO_2	0.00	0.0046
VOC's	0.0097	0.0425

Notes: 1. Based on all Hot Water units operating at once

Pressure Washers

Type of Fuel: **Natural Gas**

Number of Units 2
Heat Input: 0.35 mmBtu/hr/unit
HHV: 1020 Btu/ft^3
Total Operation 2080 Hours/yr

	Natural Gas						Total Emissions	
Pollutant	Emission Factor	Units	Source	Emission Factc	Units	Basis	(lbs/hr)	(tons/yr)
NOx	100	lb/10^6 scf	AP-42 Table 1.4-1	0.098	lbs/MMBtu	AP-42	0.07	0.07
CO	84	lb/10^6 scf	AP-42 Table 1.4-1	0.082	lbs/MMBtu	AP-42	0.06	0.06
PM10	7.6	lb/10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	AP-42	0.0052	0.01
PM2.5	7.6	lb/10^6 scf	AP-42 Table 1.4-2	0.0075	lbs/MMBtu	AP-42	0.0052	0.01
SO_2	0.6	lb/10^6 scf	AP-42 Table 1.4-2	0.00059	lbs/MMBtu	AP-42	0.0004	0.0004
VOC's	5.5	lb/10^6 scf	AP-42 Table 1.4-2	0.00539	lbs/MMBtu	AP-42	0.0038	0.0039

	1hr	24 hour	annual
	g/s	g/s	g/s
NOx	0.00864	0.00864	0.005039
CO	0.00725	0.00725	0.004233
PM10	0.00066	0.00066	0.000383
PM2.5	0.00066	0.00066	0.000383
SO2	0.00005	0.00005	3.02E-05
VOC's	0.00047	0.00047	0.000277

Notes: 1. Based on both washers operating at once

NYCT Jamaica Bus Depot - Emissions Calculations

Emergency Generator (1- 250 kW Detroit Diesel Engine)

Type of Fuel: **No.2 Fuel Oil**

Number of Units 2
Heat Input: 2 MMBtu/hr
Total Operation 150 Hours/yr

No. 2 Fuel Oil					Total Emissions	
Pollutant	Emission Factor	Units	Source	Basis	(lbs/hr)	(tons/yr)
NOx	4.41	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	17.64	1.323
CO	0.95	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	3.80	0.285
PM10	0.31	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	1.24	0.093
PM2.5	0.31	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	1.24	0.093
SO_2	0.202	lbs/MMBtu	AP-42 Table 3.4-1	AP-42	0.81	0.061
VOC's	0.35	lbs/MMBtu	AP-42 Table 3.3-1	AP-42	1.40	0.105

ASSUMES NO PEAK LOAD SHAVING

Maintenance Tail Pipe Vehicle Emissions

No. Buses being maintained/yr: 2718 Projected for year 2025
No. Buses being maintained/day: 9
Idling Time per Hour (hours): 1.08

					24 hr period	Annual Period
Pollutant	Idle Emission Factor	Units	Source	Basis	(lbs/hr)	(tons/yr)
NOx	7.23	g/veh-hr	MOVES 2014		0.007	0.023
CO	18.33	g/veh-hr	MOVES 2014		0.017	0.059
PM10	0.20	g/veh-hr	EPA Tier IV		0.000	0.001
PM2.5	0.19	g/veh-hr	EPA Tier IV		0.000	0.001
SO_2	0.00	g/veh-hr	MOVES 2014		0.000	0.000
VOC's	7.94	g/veh-hr	MOVES 2014		0.007	0.026

	Total Tailpipe Emisisons		**Per Tail Pipe Emissions**	
	short term	Annual	short term	Annual
	(g/s)	(g/s)	(g/s)	(g/s)
NOx	0.00085	0.001	1.71E-04	1.35E-04
CO	0.00217	0.002	4.34E-04	3.41E-04
PM10	0.00002	0.000	4.84E-06	3.81E-06
PM2.5	0.00002	0.000	4.46E-06	3.51E-06
SO2	0.00000	0.000	0.00E+00	0.00E+00
VOC's	0.00094	0.001	1.88E-04	1.48E-04

Emissions (tons/yr)= Emission Factor(g/hr)* (1.08hours/bus)*(number of buses maintaned per year)* (1 lbs/435.6 g)* (1tons/2000 lbs)
Assume PM10/PM2.5 emissions are controlled by DPFs with a 90% control efficiency.

ST (g/s) = # buses mainitined per day*Idling per bus (hours/bus)*Idle Factor (g/bus-hr)* (1 day/24 hrs* 1 hour/3600 sec)

Bus Movements (Onsite Mobile Emissions Inside the Building)

Daily No. of Buses In: 271 195 spaces top floor Peak hour in- 18 or 57 per level
Daily No. of Buses Out: 271 102 Peak hour out- 96
Total No. of Buse Movement: 542
Travel Distance (m):
Travel Distance (mile): 0.74
Yard Line up Travel Distance Only
(mile): 18 Buses Only 3.768
Idling Time per Hour (min): 5
Cruising Hour/Day: 1
Idling Time per Day: 3 *from old jbd calc*

	Cruising					Idling					Total
Pollutant	Emission Factor	Units	Source	(lbs/hr)	(tons/yr)	Emission Factor	Units	Source	(lbs/hr)	(tons/yr)	(tons/yr)
NOx	2.71	g/veh-mile	MOVES 2014	2.381	0.435	7.23	g/veh-hr	MOVES 2014	0.360	0.197	0.632
CO	11.30	g/veh-mile	MOVES 2014	9.944	1.815	18.33	g/veh-hr	MOVES 2014	0.914	0.500	2.315
PM10	0.09	g/veh-mile	EPA Tier IV	0.079	0.014	0.20	g/veh-hr	EPA Tier IV	0.010	0.006	0.020
PM2.5	0.08	g/veh-mile	EPA Tier IV	0.073	0.013	0.19	g/veh-hr	EPA Tier IV	0.009	0.005	0.018
SO_2	0.00	g/veh-mile	MOVES 2014	0.000	0.000	0.00	g/veh-hr	MOVES 2014	0.000	0.000	0.000
VOC's	2.69	g/veh-mile	MOVES 2014	2.366	0.432	7.94	g/veh-hr	MOVES 2014	0.396	0.217	0.649

CRUISE				**IDLE**				**Total**				**Interior Ground Area Used for**		
1 hr	short term	Annual		1 hr	short term	Annual		1 hr	short term	Annual		1Hr	24hr	Annual
(g/s)	(g/s)	(g/s)		(g/s)	(g/s)	(g/s)		(g/s)	(g/s)	(g/s)		(g/s/m^2)	(g/s/m^2)	(g/s/m^2)
0.0105	0.0021	0.0018	NOx	0.0095	0.0009	0.0008	NOx	0.0200	0.0030	0.0027		6.03E-07		
0.0439	0.0087	0.0077	CO	0.0242	0.0024	0.0021	CO	0.0681	0.0111	0.0098				
0.0003	0.0001	0.0001	PM10	0.0003	0.0000	0.0000	PM10	0.0006	0.0001	0.0001				
0.0003	0.0001	0.0001	PM2.5	0.0002	0.0000	0.0000	PM2.5	0.0006	0.0001	0.0001				
0.0000	0.0000	0.0000	SO_2	0.0000	0.0000	0.0000	SO_2	0.0000	0.0000	0.0000				
0.0104	0.0021	0.0018	VOC's	0.0105	0.0010	0.0009	VOC's	0.0209	0.0031	0.0028				

NYCT Jamaica Bus Depot - Emissions Calculations

Bus Movements (Onsite Mobile Emissions Outside of the Building)

No. of Buses In:	271	195 spaces top floor	Peak hour in-	18	or	57	per level
No. of Buses Out:	271	102	Peak hour out-	96			
Total No. of Buse Movement:	542						
Travel Distance (m):							
Travel Distance (mile):	0.06						
Idling Time per Hour (min):	5						
Cruising Hour/Day:	1						
Idling Time per Day:	1						

	Cruising					Idling					Total
Pollutant	Emission Factor	Units	Source	(lbs/hr)	(tons/yr)	Emission Factor	Units	Source	(lbs/hr)	(tons/yr)	(tons/yr)
NOx	2.71	g/veh-mile	MOVES 2014	2.381	0.435	7.23	g/veh-hr	MOVES 2014	0.360	0.197	0.632
CO	11.30	g/veh-mile	MOVES 2014	9.944	1.815	18.33	g/veh-hr	MOVES 2014	0.914	0.500	2.315
PM10	0.09	g/veh-mile	MOVES 2014	0.079	0.014	0.20	g/veh-hr	MOVES 2014	0.010	0.006	0.020
PM2.5	0.08	g/veh-mile	MOVES 2014	0.073	0.013	0.19	g/veh-hr	MOVES 2014	0.009	0.005	0.018
SO_2	0.00	g/veh-mile	MOVES 2014	0.000	0.000	0.00	g/veh-hr	MOVES 2014	0.000	0.000	0.000
VOC's	2.69	g/veh-mile	MOVES 2014	2.366	0.432	7.94	g/veh-hr	MOVES 2014	0.396	0.217	0.649

Assume PM10/PM2.5 emissions are controlled by DPFs with a 90% control efficiency.

Ground Level AREA (m^2)	2024
Assume bus exhaust I sat 3.35 meters	
Air Xchg per Hour (4-8 as per NYCT)	6

CRUISE				IDLE				Total				Ground Area - Buses Entering		
1 hr	short term	Annual		1 hr	short term	Annual		1 hr	short term	Annual		1Hr	24hr	Annual
(g/s)	(g/s)	(g/s)		(g/s)	(g/s)	(g/s)		(g/s)	(g/s)	(g/s)		(g/s/m^2)	(g/s/m^2)	(g/s/m^2)
0.0008	0.001	0.00092		0.0191	0.002	0.0017	NOx	0.0199	0.0029	0.0026		4.08E-07	5.12E-07	4.53E-07
0.0034	0.004	0.00383		0.0484	0.005	0.0042	CO	0.0518	0.0091	0.0081		1.70E-06	2.14E-06	1.89E-06
0.00003	0.00003	0.00003		0.0005	0.000	0.0000	PM10	0.0006	0.0001	0.0001		1.36E-08	1.70E-08	1.51E-08
0.00003	0.00003	0.00003		0.0005	0.000	0.0000	PM2.5	0.0005	0.0001	0.0001		1.25E-08	1.56E-08	1.39E-08
0.0000	0.000	0.00000		0.0000	0.000	0.0000	SO2	0.0000	0.0000	0.0000		0.00E+00	0.00E+00	0.00E+00
0.0008	0.001	0.00091		0.0210	0.002	0.0018	VOC's	0.0218	0.0031	0.0028		4.05E-07	5.08E-07	4.50E-07

Safety-Kleen Parts Washer Emissions

Washers service interval: Every 4 weeks
Total number of washers: 3 -model #30

Pollutant	Average Emission Factor	Units	Source	(tons/yr)
VOC's	51	gal/yr	Safety-Kleen	0.497

Emissions (tons/yr)= Emission Factor of washers (gal/yr)* (6.5 lbs/gal)*(total number of washers)* (1tons/2000 lbs)

Total Facility Emissions

Pollutants	Total Facility Emissions (Tons/year)	Major Source Threshold (Tons/Year)	Cap by rule Threshold (Tons/Year)	TOTAL FACILITY EMISSIONS (tons/yr)
NOx		25	12.5	12.3074
CO		100	50	11.7571
PM10		100	50	0.9368
PM2.5		100	50	0.9351
SO_2		100	50	0.1256
VOC's		25	12.5	1.8721

Pollutants	Estimated Facility Emissions (Tons/year)	Major Source Threshold (Tons/Year)
NOx	12.3	25
CO	11.8	100
PM10	0.9	100
PM2.5	0.9	100
SO_2	0.1	100
VOC's	1.9	25

PM2.5 Emission Calculation Sheets for Mobile Source Analysis

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					Volumes									PM2.5 Annual Emission Factors				
														21	31	32	52	53
		No Build Total Volumes	PM2.5 Annual EF	PM2.5 24-Hr EF	Passage Car	Passenger Truck	Light Commercial Truck	Single Unit short-haul Truck	Single Unit long-haul Truck	Combination short-haul Truck	Combination long-haul Truck	Transit Bus	Total	Passage Car	Passenger Truck	Light Commercial Truck	Single Unit short-haul Truck	Single Unit long-haul Truck
Liberty Ave & Guy Brewer Blvd	EB	1001	0.0114	0.1344	911	38	4	3	0	0	0	45	1001	0.008	0.007	0.009	0.379	0.278
	WB	814	0.0114	0.1344	746	21	2	1	0	0	0	43	814	0.008	0.007	0.009	0.379	0.278
	WBDP	759	0.0114	0.1344	696	20	2	1	0	0	0	40	759	0.008	0.007	0.009	0.379	0.278
Liberty Ave & 165th St	EB	874	0.0114	0.1344	795	33	3	2	0	0	0	39	874	0.008	0.007	0.009	0.379	0.278
	WB	943	0.0114	0.1344	864	25	2	2	0	0	0	50	943	0.008	0.007	0.009	0.379	0.278
	WBR	77	0.0114	0.1344	71	2	0	0	0	0	0	4	77	0.008	0.007	0.009	0.379	0.278
	NB	322	0.0090	0.1320	316	4	0	0	0	0	0	1	322	0.008	0.007	0.009	0.379	0.278
	SB	267	0.0109	0.1339	250	3	0	0	0	0	0	13	267	0.008	0.007	0.009	0.379	0.278
Liberty Ave & Tuskegee Aimen Way	EB	1075	0.0113	0.1344	985	31	3	2	0	0	0	53	1075	0.008	0.007	0.009	0.379	0.278
Liberty Ave & Merrick Blvd	EB	1069	0.0113	0.1344	979	31	3	2	0	0	0	53	1069	0.008	0.007	0.009	0.379	0.278
	WB	1050	0.0098	0.1328	961	33	3	2	0	0	0	51	1050	0.007	0.007	0.007	0.274	0.201
Liberty Ave & 168th St	EB	819	0.0077	0.1307	771	23	2	2	0	0	0	20	819	0.006	0.006	0.007	0.219	0.162
	EBDP	811	0.0077	0.1307	764	23	2	2	0	0	0	20	811	0.006	0.006	0.007	0.219	0.162
	WB	831	0.0102	0.1332	783	26	3	2	0	0	0	17	831	0.008	0.007	0.009	0.379	0.278
165th St & Tuskegee Way	NB	105	0.0087	0.1317	104	1	0	0	0	0	0	0	105	0.008	0.007	0.009	0.379	0.278
	SB	197	0.0088	0.1319	194	3	0	0	0	0	0	0	197	0.008	0.007	0.009	0.379	0.278
165th St & Archer Ave (93rd)	NB	272	0.0144	0.1374	232	2	0	0	0	0	0	37	272	0.008	0.007	0.009	0.379	0.278
	NBDP	173	0.0144	0.1374	148	1	0	0	0	0	0	24	173	0.008	0.007	0.009	0.379	0.278
	SB	145	0.0145	0.1375	123	2	0	0	0	0	0	20	145	0.008	0.007	0.009	0.379	0.278

PM2.5 24-Hour Emission Factors

61	62	41	21	31	32	52	53	61	62	41
Combination short-haul Truck	Combination long-haul Truck	Transit Bus*	Passage Car	Passenger Truck	Light Commercial Truck	Single Unit short-haul Truck	Single Unit long-haul Truck	Combination short-haul Truck	Combination long-haul Truck	Transit Bus*
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.320	0.343	0.050	0.130	0.130	0.130	0.397	0.324	0.443	0.466	0.173
0.280	0.303	0.050	0.129	0.129	0.130	0.342	0.285	0.403	0.426	0.173
0.280	0.303	0.050	0.129	0.129	0.130	0.342	0.285	0.403	0.426	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
0.374	0.394	0.050	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173

				Project Increment Volumes						Volumes							
		Build Total Volumes	No Build Total Volumes	Emlpoyee Trips	Buses	Speeds from Traffic	Speeds for AQ	PM2.5 Annual EF	PM2.5 24-Hr EF	Passage Car	Passenger Truck	Light Commercial Truck	Single Unit short-haul Truck	Single Unit long-haul Truck	Combination short-haul Truck	Combination long-haul Truck	Transit Bus
Liberty Ave & Guy Brewer Blvd	EB	1002	1001	1	0	12.30	10	0.0114	0.1344	912	38	4	3	0	0	0	45
	WB	816	814	2	0	10.82	10	0.0114	0.1344	748	21	2	1	0	0	0	43
	WBDP	761	759	2	0	10.82	10	0.0114	0.1344	698	20	2	1	0	0	0	40
Liberty Ave & 165th St	EB	875	874	1	0	12.30	10	0.0114	0.1344	796	33	3	2	0	0	0	39
	WB	943	943	0	0	10.82	10	0.0114	0.1344	864	25	2	2	0	0	0	50
	WBR	77	77	0	0	10.82	10	0.0114	0.1344	71	2	0	0	0	0	0	4
	NB	360	322	8	30	10.82	10	0.0124	0.1354	324	4	0	0	0	0	0	31
	SB	267	267	0	0	10.82	10	0.0109	0.1339	250	3	0	0	0	0	0	13
Liberty Ave & Tuskegee Aimen Way	EB	1075	1075	0	0	10.82	10	0.0113	0.1344	985	31	3	2	0	0	0	53
Liberty Ave & Merrick Blvd	EB	1074	1069	5	0	9.70	10	0.0113	0.1344	984	31	3	2	0	0	0	53
	WB	1055	1050	2	3	13.33	15	0.0099	0.1329	963	33	3	2	0	0	0	54
Liberty Ave & 168th St	EB	821	819	2	0	21.72	20	0.0076	0.1307	773	23	2	2	0	0	0	20
	EBDP	813	811	2	0	21.72	20	0.0076	0.1307	766	23	2	2	0	0	0	20
	WB	832	831	1	0	11.82	10	0.0102	0.1332	784	26	3	2	0	0	0	17
165th St & Tuskegee Way	NB	105	105	0	0	10.82	10	0.0087	0.1317	104	1	0	0	0	0	0	0
	SB	197	197	0	0	10.82	10	0.0088	0.1319	194	3	0	0	0	0	0	0
165th St & Archer Ave (93rd)	NB	303	272	1	30	10.82	10	0.0179	0.1409	233	2	0	0	0	0	0	67
	NBDP	174	173	1	0	10.82	10	0.0144	0.1374	149	1	0	0	0	0	0	24
	SB	145	145	0	0	10.82	10	0.0145	0.1375	123	2	0	0	0	0	0	20

PM2.5 JBD AltD Build Emission Sheets

	PM2.5 Annual Emission Factors								PM2.5 24-Hour Emission Factors							
	21	31	32	52	53	61	62	41	21	31	32	52	53	61	62	41
Total	Passage Car	Passenger Truck	Light Commercial Truck	Single Unit short-haul Truck	Single Unit long-haul Truck	Combination short-haul Truck	Combination long-haul Truck	Transit Bus	Passage Car	Passenger Truck	Light Commercial Truck	Single Unit short-haul Truck	Single Unit long-haul Truck	Combination short-haul Truck	Combination long-haul Truck	Transit Bus*
1002	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
816	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
761	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
875	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
943	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
77	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
360	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
267	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
1075	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
1074	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
1055	0.007064	0.006519	0.007433	0.274291	0.20065	0.319547	0.342638	0.05	0.130	0.130	0.130	0.397	0.324	0.443	0.466	0.173
821	0.00608	0.005939	0.006562	0.219406	0.161707	0.279544	0.302679	0.05	0.129	0.129	0.130	0.342	0.285	0.403	0.426	0.173
813	0.00608	0.005939	0.006562	0.219406	0.161707	0.279544	0.302679	0.05	0.129	0.129	0.130	0.342	0.285	0.403	0.426	0.173
832	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
105	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
197	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
303	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
174	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173
145	0.008486	0.007033	0.008504	0.379345	0.277587	0.374368	0.393752	0.05	0.132	0.130	0.132	0.502	0.401	0.497	0.517	0.173

Appendix C: Noise and Vibration

- Mobile Noise Calculations
- On-Site Noise Assessments

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Mobile Noise Calculations

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Jamaica Bus Depot - Mobile Noise Calculations

							Raw Traffic Volume (20 Min)					Hourly Existing Traffic Volume									
ALTERNATIVE A																					
Site	**Time**	**Period**	**Leq**	**L10**	**L50**	**L90**	**Cars**	**Bus**	**LT**	**HT**	**MC**	**Cars**	**Bus**	**LT**	**HT**	**MC**	**L10-Leq**	**Monitoring Counts Existing PCE's**	**Traffic Counts Existing Volume**	**Traffic Counts Existing PCE's**	**NB Traffic Data**
S1	7AM	AM	62.9	65.9	61.3	57.8	401	39	15	2		1203	117	45	6	0	3.0	4176	1517	4621	1587
	5PM	PM	65.0	67.2	61.1	56.1	293	36	13	1		879	108	39	3	0	2.2	3471	1443	4867	1528
	10PM	Late PM	65.1	68.0	63.3	54.4	115	37	6	2		345	111	18	6	0	2.9	2859	512	3050	545
S2	7AM	AM	68.5	71.5	67.2	60.0	493	58	12	5		1479	174	36	15	0	3.0	5784	1692	5743	1766
	5PM	PM	64.5	67.8	62.3	58.0	495	53	14	2		1485	159	42	6	0	3.3	5175	1728	5285	1821
	10PM	Late PM	66.8	65.4	58.1	54.3	131	39	5	0		393	117	15	0	0	-1.4	2694	615	3156	648
S3	7AM	AM	73.1	76.8	68.1	59.0	405	53	7	6		1215	159	21	18	0	3.7	5196	1768	6501	1844
	5PM	PM	68.6	72.1	66.7	56.8	520	49	10	3		1560	147	30	9	0	3.5	5019	1710	4916	1803
	10PM	Late PM	68.4	73.5	60.5	53.5	112	21	6	0		336	63	18	0	0	5.1	1704	628	2566	642

ALTERNATIVE B

Site	**Time**	**Period**	**Leq**	**L10**	**L50**	**L90**	**Cars**	**Bus**	**LT**	**HT**	**MC**	**Cars**	**Bus**	**LT**	**HT**	**MC**	**L10-Leq**	**Monitoring Counts Existing PCE's**	**Traffic Counts Existing Volume**	**Traffic Counts Existing PCE's**	**NB Traffic Data**
S1	7AM	AM	62.9	65.9	61.3	57.8	401	39	15	2		1203	117	45	6	0	3.0	4176	1517	4621	1587
	5PM	PM	65.0	67.2	61.1	56.1	293	36	13	1		879	108	39	3	0	2.2	3471	1443	4867	1528
	10PM	Late PM	65.1	68.0	63.3	54.4	115	37	6	2		345	111	18	6	0	2.9	2859	512	3050	545
S2	7AM	AM	68.5	71.5	67.2	60.0	493	58	12	5		1479	174	36	15	0	3.0	5784	1692	5743	1766
	5PM	PM	64.5	67.8	62.3	58.0	495	53	14	2		1485	159	42	6	0	3.3	5175	1728	5285	1821
	10PM	Late PM	66.8	65.4	58.1	54.3	131	39	5	0		393	117	15	0	0	-1.4	2694	615	3156	648
S3	7AM	AM	73.1	76.8	68.1	59.0	405	53	7	6		1215	159	21	18	0	3.7	5196	1768	6501	1844
	5PM	PM	68.6	72.1	66.7	56.8	520	49	10	3		1560	147	30	9	0	3.5	5019	1710	4916	1803
	10PM	Late PM	68.4	73.5	60.5	53.5	112	21	6	0		336	63	18	0	0	5.1	1704	628	2566	642

ALTERNATIVE D

Site	**Time**	**Period**	**Leq**	**L10**	**L50**	**L90**	**Cars**	**Bus**	**LT**	**HT**	**MC**	**Cars**	**Bus**	**LT**	**HT**	**MC**	**L10-Leq**	**Monitoring Counts Existing PCE's**	**Traffic Counts Existing Volume**	**Traffic Counts Existing PCE's**	**NB Traffic Data**
S1	7AM	AM	62.9	65.9	61.3	57.8	401	39	15	2		1203	117	45	6	0	3.0	4176	1517	4621	1587
	5PM	PM	65.0	67.2	61.1	56.1	293	36	13	1		879	108	39	3	0	2.2	3471	1443	4867	1528
	10PM	Late PM	65.1	68.0	63.3	54.4	115	37	6	2		345	111	18	6	0	2.9	2859	512	3050	545
	7AM	AM	68.5	71.5	67.2	60.0	493	58	12	5		1479	174	36	15	0	3.0	5784	1692	5743	1766

S2	5PM	PM	64.5	67.8	62.3	58.0	495	53	14	2		1485	159	42	6	0	3.3	5175	1728	5285	1821
	10PM	Late PM	66.8	65.4	58.1	54.3	131	39	5	0		393	117	15	0	0	-1.4	2694	615	3156	648
S3	7AM	AM	73.1	76.8	68.1	59.0	405	53	7	6		1215	159	21	18	0	3.7	5196	1768	6501	1844
	5PM	PM	68.6	72.1	66.7	56.8	520	49	10	3		1560	147	30	9	0	3.5	5019	1710	4916	1803
	10PM	Late PM	68.4	73.5	60.5	53.5	112	21	6	0		336	63	18	0	0	5.1	1704	608	2484	642

2028 Hourly No Build Traffic Volume										2028 Hourly Build Traffic Volume										
Cars	Bus	LT	HT	MC	No Build PCE's	NB Leq	NB L10	NB-EX Delta	Updated Build Traffic Data	Cars	Bus	LT	HT	MC	Build PCE's	% Generated Vehicles	BD Leq	BD L10	BD-NB Delta	BD-NB Delta
1393	135	52	7	0	4834	63.1	66.1	0.2	1583	1389	135	52	7	0	4822	-0.3%	63.1	66.1	0.0	0
1305	160	58	4	0	5154	65.2	67.4	0.2	1508	1288	158	57	4	0	5087	-1.9%	65.2	67.4	0.0	0
392	126	20	7	0	3246	65.4		0.3	545	392	126	20	7	0	3246	0.0%	65.4			0
1533	180	37	16	0	5994	68.7	71.7	0.2	1777	1542	181	38	16	0	6032	0.6%	68.7	71.7	0.0	0
1598	171	45	6	0	5570	64.7	68.0	0.2	1824	1601	171	45	6	0	5579	0.2%	64.7	68.0	0.0	0
485	144	19	0	0	3325	67.0		0.2	651	487	145	19	0	0	3341	0.6%	67.0			0
1586	207	27	23	0	6781	73.3	77.0	0.2	1847	1588	208	27	24	0	6792	0.2%	73.3	77.0	0.0	0
1611	152	31	9	0	5183	68.8	72.3	0.2	1808	1615	152	31	9	0	5197	0.3%	68.8	72.3	0.0	0
517	97	28	0	0	2623	68.5		0.1	644	519	97	28	0	0	2632	0.5%	68.5			0

Cars	Bus	LT	HT	MC	No Build PCE's	NB Leq	NB L10	NB-EX Delta	Updated Build Traffic Data	Cars	Bus	LT	HT	MC	Build PCE's	% Generated Vehicles	BD Leq	BD L10	BD-NB Delta	BD-NB Delta
1393	135	52	7	0	4834	63.1	66.1	0.2	1584	1390	135	52	7	0	4825	-0.2%	63.1	66.1	0.0	0
1305	160	58	4	0	5154	65.2	67.4	0.2	1509	1289	158	57	4	0	5090	-1.8%	65.2	67.4	0.0	0
392	126	20	7	0	3246	65.4		0.3	545	392	126	20	7	0	3246	0.0%	65.4			0
1533	180	37	16	0	5994	68.7	71.7	0.2	1778	1543	182	38	16	0	6035	0.7%	68.7	71.7	0.0	0
1598	171	45	6	0	5570	64.7	68.0	0.2	1824	1601	171	45	6	0	5579	0.2%	64.7	68.0	0.0	0
485	144	19	0	0	3325	67.0		0.2	651	487	145	19	0	0	3341	0.6%	67.0			0
1586	207	27	23	0	6781	73.3	77.0	0.2	1848	1589	208	27	24	0	6796	0.3%	73.3	77.0	0.0	0
1611	152	31	9	0	5183	68.8	72.3	0.2	1809	1616	152	31	9	0	5200	0.3%	68.8	72.3	0.0	0
517	97	28	0	0	2623	68.5		0.1	644	519	97	28	0	0	2632	0.5%	68.5			0

Cars	Bus	LT	HT	MC	No Build PCE's	NB Leq	NB L10	NB-EX Delta	Updated Build Traffic Data	Cars	Bus	LT	HT	MC	Build PCE's	% Generated Vehicles	BD Leq	BD L10	BD-NB Delta	BD-NB Delta
1393	135	52	7	0	4834	63.1	66.1	0.2	1584	1390	135	52	7	0	4825	-0.2%	63.1	66.1	0.0	0
1305	160	58	4	0	5154	65.2	67.4	0.2	1509	1289	158	57	4	0	5090	-1.8%	65.2	67.4	0.0	0
392	126	20	7	0	3246	65.4	68.3	0.3	549	395	127	21	7	0	3270	0.8%	65.4	68.3	0.0	0
1533	180	37	16	0	5994	68.7	71.7	0.2	1779	1544	182	38	16	0	6039	0.8%	68.7	71.7	0.0	0

1598	171	45	6	0	5570	64.7	68.0	0.2	1826	1603	172	45	6	0	5585	0.3%	64.7	68.0	0.0	0
485	144	19	0	0	3325	67.0	65.6	0.2	654	490	146	19	0	0	3356	1.1%	67.1	65.7	0.1	0.1
1586	207	27	23	0	6781	73.3	77.0	0.2	1850	1591	208	27	24	0	6803	0.4%	73.3	77.0	0.0	0
1611	152	31	9	0	5183	68.8	72.3	0.2	1810	1617	152	31	9	0	5203	0.4%	68.8	72.3	0.0	0
517	97	28	0	0	2623	68.6	73.7	0.2	648	522	98	28	0	0	2648	1.4%	68.7	73.8	0.1	0.1

On-Site Noise Assessments

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JBD ONSITE NOISE ASSESSMENT - ALT A

Alt A

Site	Description	FTA Land Use Category	Leq (day)	Avg # Buses Cleaned Day	Average # Day Buses	Leq (night)	Avg # Buses Cleaned Night	Average # Night Buses
1	Backyard Area 1	1	-39.6	16	28	-43.3	5	16
2	Backyard Area 2 (Elevated	1	-39.6	16	28	-43.3	5	16
2A	Backyard Area 2 (Elevated	2	-39.6	16	28	-43.3	5	16
3	Senior Buidling	1	-39.6	16	28	-43.3	5	16
4	Senior Buidling (Elevated)	1	-39.6	16	28	-43.3	5	16
5	Church	2	-33.7	65	95	-73.4	0.01	0
6	Residential Home (Merrick)	1	-39.6	16	28	-43.3	5	16
7	Residential Home (Merrick) Elevated	1	-39.6	16	28	-43.3	5	16

Area1 (Yard Parking + Depot)

Site	Description	FTA Land Use Category	Leq (day)	Avg # Buses Cleaned Day	Average # Day Buses	Leq (night)	Avg # Buses Cleaned Night	Average # Night Buses	SEL	L(dn) or L(eq1hr) @ 50 feet		Distance To Parking Area CL	Hs	Hb	Hr	H_{eff}
1	Backyard Area 1	1	70.7	16	16	66.7	5	9	111	74.0		90	2.5	40	6	44.25
2	Backyard Area 2 (Elevated 20')	1	70.7	16	16	66.7	5	9	111	74.0		90	2.5	40	6	44.25
2A	Backyard Area 3 (Elevated 30')	1	70.7	16	16	66.7	5	9	111	74.0		90	2.5	40	6	44.25
3	Senior Buidling	1	70.7	16	16	66.7	5	9	111	74.0		460	2.5	40	6	44.25
4	Senior Buidling (Elevated)	1	70.7	16	16	66.7	5	9	111	74.0		460	2.5	40	6	44.25
5	Church	2	76.7	65	53	38.8	0.01	0.01	111	74.7		90	2.5	40	6	44.25
6	Residential Home (Merrick)	1	38.8	0.01	0.01	38.8	0.01	0.01	111	45.2		100000	2.5	40	6	44.25
7	Residential Home (Merrick) Elevated	1	38.8	0.01	0.01	38.8	0.01	0.01	111	45.2		100000	2.5	40	6	44.25

Area2 (Roof Parking Only)

Site	Description	FTA Land Use Category	Leq (day)	Avg # Buses Cleaned Day	Average # Day Buses	Leq (night)	Avg # Buses Cleaned Night	Average # Night Buses	SEL	L(dn) or L(eq1hr) @ 50 feet		Distance To Parking Area CL	Hs	Hb	Hr	H_{eff}
1	Backyard Area 1	1	63.2	0	12	60.9	0	7	111	67.8		250	2.5	40	6	44.25
2	Backyard Area 2 (Elevated	1	63.2	0	12	60.9	0	7	111	67.8		250	2.5	40	6	44.25
2A	Backyard Area 3 (Elevated 30')	1	63.2	0	12	60.9	0	7	111	67.8		250	2.5	40	6	44.25
3	Senior Buidling	1	63.2	0	12	60.9	0	7	111	67.8		480	2.5	40	6	44.25
4	Senior Buidling (Elevated)	1	63.2	0	12	60.9	0	7	111	67.8		480	2.5	40	6	44.25
5	Church	2	68.6	0	42	38.8	0.01	0.01	111	66.6		250	2.5	40	6	44.25
6	Residential Home (Merrick)	1	66.2	0	12	63.9	0	7	114	70.8		340	2.5	40	6	44.25
7	Residential Home (Merrick) Elevated	1	66.2	0	12	63.9	0	7	114	70.8		340	2.5	40	6	44.25

* Volumes divided bewteen the two outside areas

AREA3

Site	Description	FTA Land Use Category	Leq (day)	Speed	Average # Day Buses	Leq (night)	Cs	Average # Night Buses	SEL	L(dn) or L(eq1hr) @ 50 feet		Distance To Parking Area CL	Hs	Hb	Hr	H_{eff}
1	Backyard Area 1	1	38.4	5	28	41.6	15	16	82	47.7		10000	2.5	40	6	44.25
2	Backyard Area 2 (Elevated	1	38.4	5	28	41.6	15	16	82	47.7		10000	2.5	40	6	44.25
2A	Backyard Area 3 (Elevated 30')	1	37.4	5	28	41.8	16	16	82	47.8		10000	2.5	40	6	44.25
3	Senior Buidling	1	38.4	5	28	41.6	15	16	82	47.7		125	2.5	40	6	44.25
4	Senior Buidling (Elevated)	1	38.4	5	28	41.6	15	16	82	47.7		125	2.5	40	6	44.25
5	Church	2	38.4	5	95	0.0	15	0.01	82	36.4		10000	2.5	40	6	44.25
6	Residential Home (Merrick)	1	38.4	5	28	41.6	15	16	82	47.7		173	2.5	40	6	44.25
6	Residential Home (Merrick) Elevated	1	38.4	5	28	41.6	15	16	82	47.7		173	2.5	40	6	44.25

Site	Description	Final L(dn) or L(eq)
1	Backyard Area 1	55
2	Backyard Area 2 (Elevated 20')	55
2A	Backyard Area 3 (Elevated 30')	59
3	Senior Buidling	45
4	Senior Buidling (Elevated)	56
5	Church	56
6	Residential Home (Merrick)	45
7	Residential Home (Merrick)Elevated	46

Analysis Site #	Land Use	Ambient Total Noise Level (Ldn)	FTA Impact Threshold Levels (dBA)		Total Project Noise Exposure (Ldn)	Noise Imapcts?		
			Moderate	Severe			Delta between exist and project	FTA Land Use Category
1	Residential Backyard Area 1	65	61	66	54.9	N	10.0	2
2	Resdienatial Backyard Area 2 (Elevated 20')	65	61	66	54.9	N	10.0	2
2A	Backyard Area 3 (Elevated 30')	65	61	66	58.9	**N**	6.1	2
3	Senior Buidling	73	65	72	45.0	N	28.0	2
4	Senior Buidling (Elevated)	73	65	72	55.8	**N**	17.2	2
5	Rose of Sharon Baptist Church	65	66	71	55.6	N	9.3	3
6	Residential Home (Merrick)	70	64	69	45.3	N	24.7	2
7	Residential Home (Merrick)Elevated	70	64	69	45.7	N	24.3	2

*Electric buses will not be accounted for until we determine that there is a significant decrease in noise emissions from electrics compared to diesels
* Merrick property conservatively assumed to include depot and rooftop parking noise.
* Merrick existin Ldn was calculated from three measurements

Area1 (Yard Parking + Depot) - Continued

G*	Final L(dn) or L(eq)	1st Wall Attenuation	Final L(dn) or L(eq) with 1st Wall Attenuation	2nd Wall Attenuation	Final L(dn) or L(eq) with 1st & 2nd Wall Attenuation
0.000	68.9	13.9	55		
0.000	68.9	13.9	55		
0.000	68.9	11.5	57		
0.000	54.7	10.7	44		
0.000	54.7	0.0	55		
0.000	69.6	13.9	56		
0.000	-20.9	0.0	-21		
0.000	-20.9	0.0	-21		

Area2 (Roof Parking Only) - Continued

G*	Final L(dn) or L(eq)	2nd perimeter Wall Attenuation	Final L(dn) or L(eq) with 1st Wall Attenuation	1st Roof Wall Attenuation	Final L(dn) or L(eq) with 1st & 2nd Wall Attenuation	HRU Attenuation	Final L(dn) or L(eq) with 1st & 2nd Wall Attenuation
0.000	53.8	13.17	42	12.07	29	3.00	26
0.000	53.8	10.62	41	12.83	30	3.00	27
0.000	53.8	0.00	54	0.00	54	3.00	51
0.000	48.1	10.88	37				
0.000	48.1	0.00	48				
0.000	52.6	13.17	41	12.07	27	3.00	24
0.000	54.1	0.00	54	11.88	42		
0.000	54.1	0.00	54	11.13	43		

AREA3 - Continued

G*	Final L(dn) or L(eq)	1st Wall Attenuation	Final L(dn) or L(eq) with 1st Wall Attenuation	2nd Wall Attenuation	Final L(dn) or L(eq) with 1st & 2nd Wall Attenuation
0.000	24.7	0.00	25		
0.000	24.7	0.00	25		
0.000	24.8	0.00	25		
0.000	43.7	13.90	30		
0.000	43.7	0.00	44		
0.000	13.3	0.00	13		
0.000	42.3	0.00	42		
0.000	42.3	0.00	42		

JBD ONSITE NOISE ASSESSMENT - Alt B

Site	Description	FTA Land Use Category		Avg # Buses Cleaned Day	Average # Day Buses		Avg # Buses Cleaned Night	Average # Night Buses
1	Backyard Area 1	1		16	28		5	16
2	Backyard Area 2 (Elevated 20'	1		16	28		5	16
2A	Backyard Area 2 (Elevated 30'	1		16	28		5	16
3	Senior Buidling	1		16	28		5	16
4	Senior Buidling (Elevated)	1		16	28		5	16
5	Church	2		65	95		0.01	0
6	Residential Home (Merrick)	1		16	28		5	16
7	Residential Home (Merrick) Elevated	1		16	28		5	16

Area1

Site	Description	FTA Land Use Category	Leq (day)	Avg # Buses Cleaned Day	Average # Day Buses	Leq (night)	Avg # Buses Cleaned Night	Average # Night Buses	SEL	L(dn) or L(eq1hr) @ 50 feet		Distance To Parking Area CL	Hs	Hb	Hr	H_{eff}
1	Backyard Area 1	1	67.5	6	11	63.8	2	7	111	71.0		265	2.5	40	6	44.25
2	Backyard Area 2 (Elevated 20'	1	67.5	6	11	63.8	2	7	111	71.0		265	2.5	40	6	44.25
2A	Backyard Area 2 (Elevated 30'	1	67.5	6	11	63.8	2	7	111	71.0		265	2.5	40	6	44.25
3	Senior Buidling	1	67.5	6	11	63.8	2	7	111	71.0		480	2.5	40	6	44.25
4	Senior Buidling (Elevated)	1	67.5	6	11	63.8	2	7	111	71.0		480	2.5	40	6	44.25
5	Church	2	73.4	26	39	33.7	0	0	111	71.4		265	2.5	40	6	44.25
6	Residential Home (Merrick)	1	67.5	6	11	63.8	2	7	111	71.0		340	2.5	40	6	44.25
7	Residential Home (Merrick) Elevated	1	67.5	6	11	63.8	2	7	111	71.0		340	2.5	40	6	44.25

* Volumes apportioned bewteen the three bus storage areas

Area2 (Entering Depot)

Site	Description	FTA Land Use Category	Leq (day)	Speed	Average # Day Buses	Leq (night)	Cs	Average # Night Buses	SEL	L(dn) or L(eq1hr) @ 50 feet		Distance To Parking Area CL	Hs	Hb	Hr	H_{eff}
1	Backyard Area 1	1	38.4	5	28	41.6	15	16	82	47.7		131	2.5	40	6	44.25
2	Backyard Area 2 (Elevated	1	38.4	5	28	41.6	15	16	82	47.7		131	2.5	40	6	44.25
2A	Backyard Area 2 (Elevated 30'	1	38.4	5	28	41.6	15	16	82	47.7		131	2.5	40	6	44.25
3	Senior Buidling	1	38.4	5	28	41.6	15	16	82	47.7		125	2.5	40	6	44.25
4	Senior Buidling (Elevated)	1	38.4	5	28	41.6	15	16	82	47.7		125	2.5	40	6	44.25
5	Church	2	38.4	5	28	0.0	15	0	82	36.4		131	2.5	40	6	44.25
6	Residential Home (Merrick)	1	38.4	5	28	41.6	15	16	82	47.7		1000000	2.5	40	6	44.25
7	Residential Home (Merrick) Elevated	1	38.4	5	28	41.6	15	16	82	47.7		1000000	2.5	40	6	44.25

AREA3 (107th Ave)

Site	Description	FTA Land Use Category	Leq (day)	Speed	Average # Day Buses	Leq (night)	Cs	Average # Night Buses	SEL	L(dn) or L(eq1hr) @ 50 feet		Distance To Parking Area CL	Hs	Hb	Hr	H_{eff}
1	Backyard Area 1	1	38.4	5	28	41.6	15	16	82	47.7		10000	2.5	40	6	44.25
2	Backyard Area 2 (Elevated	1	38.4	5	28	41.6	15	16	82	47.7		10000	2.5	40	6	44.25
2A	Backyard Area 2 (Elevated 30'	1	38.4	5	28	41.6	15	16	82	47.7		10000	2.5	40	6	44.25
3	Senior Buidling	1	38.4	5	28	41.6	15	16	82	47.7		125	2.5	40	6	44.25
4	Senior Buidling (Elevated)	1	38.4	5	28	41.6	15	16	82	47.7		125	2.5	40	6	44.25
5	Church	2	38.4	5	28	0.0	15	0.01	82	36.4		10000	2.5	40	6	44.25
6	Residential Home (Merrick)	1	38.4	5	28	41.6	15	16	82	47.7		10000	2.5	40	6	44.25
7	Residential Home (Merrick) Elevated	1	38.4	5	28	41.6	15	16	82	47.7		10000	2.5	40	6	44.25

Site	Description	Final L(dn) or L(eq)
1	Backyard Area 1	44
2	Backyard Area 2 (Elevated	51
2A	Backyard Area 2 (Elevated 30'	57
3	Senior Buidling	40
4	Senior Buidling (Elevated)	53
5	Church	44
6	Residential Home (Merrick)	41
7	Residential Home (Merrick) Elevated	42

Analysis Site #	Land Use	Ambient Total Noise Level (Ldn)	FTA Impact Threshold Levels (dBA)		Total Project Noise Exposure (Ldn)	Noise Imapcts?		
			Moderate	Severe			Delta between exist and project	FTA Land Use Category
1	Backyard Area 1	65	61	66	44	N	21.4	2
2	Backyard Area 2 (Elevated	65	61	66	51	N	13.5	2
2A	Backyard Area 2 (Elevated 30'	65	61	66	57	N	8.3	2
3	Senior Buidling	73	65	72	40	N	33.3	2
4	Senior Buidling (Elevated)	73	70	77	53	N	20.4	3
5	Church	65	61	66	44	N	21.1	2
6	Residential Home (Merrick)	70	64	69	41	N	28.9	2
7	Residential Home (Merrick) Elevated	70	64	69	42	N	28.2	2

Area1 - Continued

G*	Final L(dn) or L(eq)	Wall Attenuation	Final L(dn) or L(eq) with Wall Attenuation
0.000	56.5	13.3	43
0.000	56.5	5.5	51
0.000	56.5	0.0	56
0.000	51.3	12.7	39
0.000	51.3	0.0	51
0.000	56.9	13.3	44
0.000	54.3	13.4	41
0.000	54.3	12.6	42

Area2 (Entering Depot) - Continued

G*	Final L(dn) or L(eq)	Final L(dn) or L(eq) with Wall Attenuation	Final L(dn) or L(eq) with Wall Attenuation
0.000	43.5	13.51	30
0.000	43.5	2.83	41
0.000	43.5	0.00	43
0.000	43.7	13.58	30
0.000	43.7	0.00	44
0.000	32.2	0.00	32
0.000	4.7	0.00	5
0.000	4.7	0.00	5

AREA3 (107th Ave) - Continued

G*	Final L(dn) or L(eq)	Final L(dn) or L(eq) with Wall Attenuation	Final L(dn) or L(eq) with Wall Attenuation
0.000	24.7	0.00	25
0.000	24.7	0.00	25
0.000	24.7	0.00	25
0.000	43.7	14.12	30
0.000	43.7	0.00	44
0.000	13.3	0.00	13
0.000	24.7	0.00	25
0.000	24.7	0.00	25

JBD ONSITE NOISE ASSESSMENT - Alt D

Site	Description	FTA Land Use Category	Leq (day)	Avg # Buses Cleaned Day	Average # Day Buses	Leq (night)	Avg # Buses Cleaned Night	Average # Night Buses
1	Backyard Area 1	1	-39.6	16	28	-43.3	5	16
2	Backyard Area 2 (Elevated	1	-39.6	16	28	-43.3	5	16
3	Senior Buidling	1	-39.6	16	28	-43.3	5	16
4	Senior Buidling (Elevated)	1	-39.6	16	28	-43.3	5	16
5	Church	2	-33.7	65	95	-73.4		

AREA3

Site	Description	FTA Land Use Category	Leq (day)	Speed	Average # Day Buses	Leq (night)	Cs	Average # Night Buses	SEL	L(dn) or L(eq1hr) @ 50 feet		Distance To Parking Area CL	Hs	Hb	Hr
1	Backyard Area 1	1	38.4	5	28	41.6	15	16	82	47.7		10000	2.5	40	6
2	Backyard Area 2 (Elevated	1	38.4	5	28	41.6	15	16	82	47.7		10000	2.5	40	6
3	Senior Buidling	1	38.4	5	28	41.6	15	16	82	47.7		125	2.5	40	6
4	Senior Buidling (Elevated)	1	38.4	5	28	41.6	15	16	82	47.7		125	2.5	40	6
5	Church	2	38.4	5	95	0.0	15	0	82	36.4		10000	2.5	40	6

Site	Description	Final L(dn) or L(eq)
1	Backyard Area 1	25
2	Backyard Area 2 (Elevated	25
3	Senior Buidling	30
4	Senior Buidling (Elevated)	44
5	Church	13

Analysis Site #	Land Use	Ambient Total Noise Level (Ldn)	FTA Impact Threshold Levels (dBA)		Total Project Noise Exposure (Ldn)	Noise Imapcts?		
			Moderate	Severe			Delta between exist and project	FTA Land Use Category
1	Residential Backyard Area 1							
2	Resdienatial Backyard Area 2 (Elevated)							
3	Senior Buidling	73	65	72	30	N	43.4	2
4	Senior Buidling (Elevated)	73	65	72	44	N	29.3	2

5	Rose of Sharon Baptist Church	[redacted]

AREA3 - Continued

H_{eff}	G*	Final L(dn) or L(eq)	Final L(dn) or L(eq) with Wall Attenuation	Final L(dn) or L(eq) with Wall Attenuation
44.25	0.000	24.7	0.00	25
44.25	0.000	24.7	0.00	25
44.25	0.000	43.7	14.12	30
44.25	0.000	43.7	0.00	44
44.25	0.000	13.3	0.00	13

Appendix D: Cultural Resources

Phase IA Cultural Resources Assessment

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HISTORICAL PERSPECTIVES INC.

Phase IA Cultural Resources Assessment
Reconstruction and Expansion Project
Jamaica Bus Depot
165-18 Tuskegee Airmen Way, Jamaica NY 11433
Queens County, New York

NYSOPRHP 16PR04142

Phase IA Cultural Resources Assessment
Reconstruction and Expansion Project
Jamaica Bus Depot
165-18 Tuskegee Airmen Way, Jamaica NY 11433
Queens County, New York

NYSOPRHP 16PR04142

Prepared For:

STV Incorporated
225 Park Avenue South
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And

New York City Transit
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New York City, New York 10004

Prepared By:

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P.O. Box 529
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Author:
Julie Abell Horn, M.A., R.P.A.

August 2016

Revised March 2019

MANAGEMENT SUMMARY

SHPO Project Review Number (if available): **16PR04142**

Involved State and Federal Agencies: **MTA New York City Transit (NYCT)**

Phase of Survey: **Phase IA Cultural Resources Assessment**

Location Information

Location: **Block 10164, Lots 41, 46, 53, 60, 61, 63, 66, 68, 72, 74, 76, 79, 80, 84, 89, 90, 95, 97, and 103 (19 lots).**
Minor Civil Division: **08101**
County: **Queens**

Survey Area

Length: **varies**
Width: **varies**
Number of Acres Surveyed: **6.6 acres**

USGS 7.5 Minute Quadrangle Map: **Jamaica**

Archaeological Survey Overview

Number & Interval of Shovel Tests: **N/A**
Number & Size of Units: **N/A**
Width of Plowed Strips: **N/A**
Surface Survey Transect Interval: **N/A, urban area**

Results of Archaeological Survey

Number & name of precontact sites identified: **None**
Number & name of historic sites identified: **None**
Number & name of sites recommended for Phase II/Avoidance: **None**

Results of Architectural Survey

Number of buildings/structures/cemeteries within project area: **15 buildings on 19 lots**
Number of buildings/structures/cemeteries adjacent to project area: **numerous buildings, urban area**
Number of previously determined NRHP listed or eligible buildings/structures/cemeteries/districts: **none**
Number of identified eligible buildings/structures/cemeteries/districts: **none**

Report Authors(s): **Julie Abell Horn, M.A., R.P.A., Historical Perspectives, Inc.**

Date of Report: **August 2016, revised March 2019**

EXECUTIVE SUMMARY

The MTA NYCT (NYCT) proposes the reconstruction and expansion of the Jamaica Bus Depot (JBD), located at 165-18 Tuskegee Airmen Way (formerly South Road), in the Jamaica neighborhood of Queens County, New York (Figures 1, 2, and 3). The current JBD property includes Block 10164, Lots 46, 80, 84, 97, and 103. The project site for the JBD reconstruction and expansion additionally includes adjacent Lots 41, 53, 60, 61, 63, 66, 68, 72, 74,76, 79, 89, 90, and 95. In total, the JBD project site consists of 19 lots on Block 10164, including the entire frontage on Merrick Boulevard (Figure 3). Lots 41, 53, 60, 61, 63, 66, 68, and 72 have already been acquired by NYCT and others would be acquired in the future. Block 10164 is bounded by Tuskegee Airmen Way on the northwest, 107th Avenue on the southeast, Merrick Boulevard on the northeast, and 165th Street on the southwest. The present JBD was constructed in 1939 and was expanded eastwardly to add a bus wash area and provide an additional storage area in 1950. In 1968, offices and locker rooms were constructed on the north side of the facility on an upper mezzanine level.

NYCT will be performing a State Environmental Quality Review Act (SEQRA) environmental impact analysis of the JBD project to determine the significance of the impacts and mitigation measures to address any impacts, if indicated. A Draft and Final Environmental Impact Statement (DEIS/FEIS) will be prepared in accordance with all applicable state law and regulations. As part of the review process, a Phase IA Cultural Resources Assessment is required to identify known and potential archaeological and historic resources within the Area of Potential Effect (APE).

The APE for archaeological resources is limited to the locations of proposed ground disturbance, and consists of the 19 project site lots on Block 10164, known as the project site. The APE for historic (architectural) resources is considered to include the entire Block 10164 project site as well as the area substantially contiguous to the project site. According to SEQRA, the term "substantially contiguous" is intended to cover situations where a proposed activity is not directly adjacent to a sensitive resource, but is in close enough proximity that it could potentially have an impact. Generally, this would include resources that could be seen from "long vistas" at ground level, until project development heights are finalized and an official viewscape can be determined. For the purposes of this study, HPI considers an approximate 400-foot radius from the project site to be the architectural APE, which New York City Environmental Quality Review (CEQR) regulations indicate is typically adequate for assessment of historic resources in terms of physical, visual, and historical relationships in New York City (SEQRA Handbook 2019; CEQR 2014).

This report constitutes the required Phase IA Cultural Resources Assessment and complies with the standards of the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) (New York Archaeological Council 1994, NYSOPRHP 2005, 2010).

The Phase IA research determined that disturbance within the archaeological APE includes several types. In its natural state, the property was a generally level parcel with a creek running through it. As development of the area increased, various residential, and later, commercial and industrial buildings were constructed on the different site lots. The creek was filled in after the turn of the twentieth century.

The JBD was constructed in stages beginning in 1939, on land that previously was vacant. The original construction included a ca. 18-foot deep cellar area for the boiler room located within the interior portion of the building, which was abandoned and backfilled when a new first-floor level boiler room was constructed near the Tuskegee Airmen Way end of the building. Although there is not a full basement level at the JBD, there are multiple subgrade disturbances across the parcel from:

- underground fuel and other utility tanks;
- buried fuel, water, sewer, and other utility conduits;
- bus wash drainage lines;
- long, narrow subsurface pits for bus washing and servicing; and,
- construction and renovations of the existing building.

There also have been multiple episodes of building construction, demolition, and subsequent construction on most of the project site lots not covered by the JBD. The Merrick Boulevard frontage of the project site originally contained

residences and stores, but now contains nearly all commercial and industrial buildings, including warehouses. During the twentieth century there were multiple buried fuel tanks associated with filling stations on Lots 53, 60, 80 and 84 (Sanborn 1951, Figure 12). Most of the former and existing buildings on Merrick Boulevard do not have basements, with the exception of the warehouse on Lot 68, the tire store warehouse on Lot 74, and the multiple-story former apartment/commercial building on Lot 89. The warehouse on Lot 41 at the corner of South Road and 165th Street does not have a basement.

Last, there is an active fuel spill on much of the JBD block, including the project site, which has been monitored over the course of ca. 25 years but cannot be fully remediated due to the ubiquity of the spill throughout the project site soils.

From what is known of precontact period settlement patterns on in New York City and Long Island, most habitation and processing sites are found in sheltered, elevated sites close to wetland features, major waterways, and with nearby sources of fresh water. In its natural condition, the project site had a small creek running through it. Combined with its level terrain, the project site would have represented a favorable location for Native American settlement.

However, as described above, the project site has experienced substantial disturbance that appears to have destroyed much if not all of the soils in the upper reaches of the soil column, where precontact period archaeological sites normally are located. The soil borings indicate that the upper reaches of the present soil column consists entirely of fill. Although the soil borings do not indicate the origin of the fill, it is likely that the fill is actually original site soils that were disturbed from excavation and then redeposited. None of the soil borings recorded any strata that appear to correspond to an original A or B horizon (or even a buried A or B horizon), where precontact resources generally are found.

Based on these factors, the project site now is considered to have a low potential for hosting precontact cultural remains.

The project site contained one structure, on Lot 41, which stood from at least the late eighteenth century through the 1960s. This dwelling was located on a large tract south of Tuskegee Airmen Way prior to implementation of the present city grid and creation of blocks and lots. The house was attributed to variously to Powell (1852), Jno Phruner (1859), Jno. Case estate (1873), and J. Case estate (1891). Today, the area where the house once stood is covered by a large warehouse, constructed in 1994. There is no visible evidence of any potential archaeological resources associated with this former house on the project site. Although the current warehouse does not have a basement level, soil borings from other parts of the project site indicate that even in areas that did not have basement excavation, there is widespread and extensive disturbance from grading and filling associated with multiple episodes of construction and demolition across the site.

The remainder of the project site remained undeveloped through the 1880s. By the early 1890s, there was a saloon on Lot 53 and a blacksmith shop on Lot 60. The rest of the project site lots began to be developed during the 1890s and first decades of the twentieth century, generally with houses and small stores. Over time, the initial buildings on the project site were demolished and larger stores and warehouses were constructed in their places.

Given the level of disturbance across the project site lots, as described above, HPI concludes that there is little to no historic period archaeological sensitivity on the project site.

HPI concludes that there are no architectural resources on or within a 400-foot radius of the project site that are eligible or listed on the State/National Register of Historic Places (S/NRHP) or are a New York City Landmarked resource. The JBD does not appear to meet criteria for S/NRHP eligibility, nor do any of the buildings or structures within the Architectural APE.

HPI has determined that there is no remaining precontact or historic period archaeological sensitivity on the project site. No additional archaeological investigations are recommended and there are no additional historic resources concerns for the project site.

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I. INTRODUCTION

The MTA NYCT (NYCT) proposes the reconstruction and expansion of the Jamaica Bus Depot (JBD), located at 165-18 Tuskegee Airmen Way (formerly South Street and South Road)[1], in the Jamaica neighborhood of Queens County, New York (Figures 1, 2, and 3). The current JBD property includes Block 10164, Lots 46, 80, 84, 97, and 103. The project site for the JBD reconstruction and expansion additionally includes adjacent Lots 41, 53, 60, 61, 63, 66, 68, 72, 74,76, 79, 89, 90, and 95. In total, the JBD project site consists of 19 lots on Block 10164, including the entire frontage on Merrick Boulevard (Figure 3). Some of these lots have already been acquired by NYCT and others would be acquired in the future. Block 10164 is bounded by Tuskegee Airmen Way on the northwest, 107th Avenue on the southeast, Merrick Boulevard on the northeast, and 165th Street on the southwest. The present JBD was constructed in 1939 and was expanded eastwardly to add a bus wash area and provide an additional storage area in 1950. In 1968, offices and locker rooms were constructed on the north side of the facility on an upper mezzanine level.

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This report constitutes the required Phase IA Cultural Resources Assessment and complies with the standards of the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) (New York Archaeological Council 1994, NYSOPRHP 2005, 2010).

II. METHODOLOGY

The present study entailed review of various resources.

- Primary and secondary sources concerning the general history of Jamaica, Queens and specific events associated with the project site and vicinity were reviewed using materials at the Archives at Queens Library, the New York Public Library, the library of HPI, and online resources.
- Historic maps and atlases were reviewed using materials at the Archives at Queens Library, the New York Public Library, the library of HPI, and using various online websites. These cartographic sources provided an overview of the topography and a chronology of land usage for the project site. A selection of these maps and atlases has been reproduced for this report.
- Department of Building records were reviewed using online resources.

[1] This report refers to the roadway as Tuskegee Airmen Way when discussing current conditions, but refers to the roadway as South Street or South Road when referencing data from periods prior to the name change. Due to the relatively recent change in the official name, many maps have not yet made the transition to the new designation.

- Information about previously recorded archaeological and historic sites and surveys in the area was compiled from data available at the NYSOPRHP, the New York City Landmarks Preservation Commission (LPC), and the library of HPI.
- The project sponsor provided a number of Phase I Environmental Site Assessment reports for lots within the project site (STV 2012, 2015a-f).
- The project sponsor provided building and renovation plans for the JBD.
- The project sponsor provided soil borings for the JBD.
- Last, a site visit was conducted on August 2, 2016, to assess any obvious or unrecorded subsurface disturbance and to document buildings in the architectural APE (Photographs 1–35; Figures 2 and 3). Updated conditions were photographed on March 13, 2019. The interiors of those buildings within the project site that currently are owned by NYCT were accessed during the site visit to ascertain conditions and any additional disturbance. Those buildings on lots not presently owned by NYCT were viewed from the exterior only.

III. CURRENT CONDITIONS AND ENVIRONMENTAL SETTING

A. Current Conditions

- **Archaeological APE**

The JBD project site, which constitutes the Archaeological APE, contains 19 individual lots, as described below, in numerical order. The lot numbers ascend running clockwise around the block from the corner of Tuskegee Airmen Way and 165th Street, as shown on Figure 2.

Lot 41

The entire footprint of Lot 41 is covered by a one-story brick and concrete warehouse building, which was constructed in 1994 (Photograph 1). It contains a concrete slab floor and no basement. It is currently used to store buses and other materials related to the JBD (Photograph 2).

Lot 46

Lot 46 contains the existing JBD (Photographs 3-10). The main part of the building was constructed in 1939 with the bus wash area, which is a long, narrow section on the northeast side of the structure, erected in 1950. The JBD is a brick and metal structure. Most of the building is one story high, with a second floor and mezzanine located near the Tuskegee Airmen Way entrance. There formerly was a basement level (ca. 18 feet deep) within a section of the interior of the building, which contained the boiler room. Within the last five years, a new boiler room was created within the one-story section of the JBD along Tuskegee Airmen Way. At that time, the old boilers were removed and the basement section was backfilled.

In addition to the former basement area, there are multiple below grade components within Lot 46 including underground fuel and other utility tanks; buried fuel, water, sewer, and other utility conduits; bus wash drainage lines; and long, narrow subsurface pits for bus washing and servicing.

Lot 46 also includes a portion of the asphalt paved driveway along 107th Avenue.

Lot 53

Lot 53 is presently an asphalt-paved parking area (Photograph 11). It formerly contained Kelly's Family Restaurant, a one-story concrete building. The structure was originally an auto repair shop during the second half of the twentieth century. Patches across the paving attest to former fuel tanks that were located on the lot when there was a filling station located on it in the mid-twentieth century.

Lots 60 and 61

These two lots are presently vacant, paved with asphalt and with adjacent Lots 53, 63, and 66, used for parking and enclosed by chain link fencing along Merrick Boulevard (Photograph 12). They formerly contained two one-story iron structures used as an auto repair shop.

Lots 63 and 66

These lots are presently vacant, paved with asphalt, used for parking, and enclosed by chain link fencing along Merrick Boulevard, along with Lots 53, 60, and 61. Until recently they contained one-story brick warehouse buildings that were joined on the interior and covered the entire footprint of the lots (Photograph 13). The buildings did not have basements. The buildings, which all dated to the mid to later twentieth century, were owned most recently by Hadco, a metal wholesaler distribution company.

Lot 68

This lot contains a one-story brick warehouse building that covers the entire footprint of the lot (Photograph 14). The building was constructed in 1969 and has a partial basement.

Lot 72

This lot contains a one-story brick warehouse from the 1930s (Photograph 15). It has a partial basement.

Lot 74

Lot 74 is a one-story brick building that currently contains an automobile tire business (Photograph 16). Department of Buildings records indicate that it has a cellar with a boiler room, although the depth of the cellar was not given.

Lots 76

Lot 76 is a parcel that until 2018 was vacant , but now has a one-story building being constructed on it (Photograph 17). The lot abuts the L-shaped Lot 79, which contains a one-story building that covers its entire footprint.

Lot 79

Lot 79 contains a one-story building that covers its entire footprint (Photograph 18). Currently, the building is vacant but until recently contained a Domino's Pizza establishment.

Lots 80, 84, 97 and 103

These four lots are part of the JBD parking lot (Photograph 19). They are paved with asphalt. Buses enter the parking lot through the gate on 107th Avenue and exit via the gate on Merrick Boulevard. There is a small one-story brick office building on Lot 80. Numerous subsurface fuel tanks have been located on these lots over time.

Lot 89

Lot 89 contains a three-story with basement brick apartment building and a small rear yard (Photograph 20). It dates to the 1910s.

Lot 90

Lot 90 contains a one-story brick and concrete block commercial building, which covers the entire footprint of the lot (Photographs 21 and 22). It dates to the first decades of the twentieth century.

Lot 95

Lot 95 presently is a vacant lot, fronting 107th Avenue (Photograph 23). Until ca. 1987, it contained a dwelling that for a time was used as a church.

Lots 97 and 103

These two lots also are part of the JBD parking lot (Photograph 24). They are paved with asphalt. Lot 97 formerly contained residences, which were razed in the 1980s.

- **Architectural APE**

The Architectural APE includes those areas within 400 feet of the project site. It mainly includes a mix of residential and commercial structures. Areas of the Architectural APE are discussed below.

165th Street and 164th Place

The northeast side of 165th Street abuts the project site on Block 10164 (Photographs 25 and 26). The street, as well as 164th Place to the southeast, is primarily residential, with many houses dating to the first two decades of the twentieth century. One building abutting the project site on 165th Street (104-19 165th Street) presently contains the Rose of Sharon Baptist Church (Photograph 27). The church was constructed as an apartment building in the early twentieth century and was converted for religious use in the 1990s.

Tuskegee Airmen Way (formerly South Road)

Tuskegee Airmen Way, formerly known as South Road, is one of the oldest thoroughfares in the area. However, the section of Tuskegee Airmen Way within the Architectural APE generally contains structures dating to the early decades of the twentieth century. The south side of Tuskegee Airmen Way, west of 165th Street, contains a series of attached rowhouses from this period (Photograph 28). York College owns undeveloped property on the north side of Tuskegee Airmen Way, diagonally across from the project site (Photograph 29).

Liberty Avenue

The portion of Liberty Avenue within the Architectural APE contains mostly commercial buildings, such as the multiple-story brick warehouse at 165th Street, directly across from the project site (Photograph 30). Retail establishments are located on both sides of the road as well (Photograph 31).

Merrick Boulevard and northeast

Merrick Boulevard also is a commercial strip, with many low-rise buildings on the northeast side of the street, across from the project site (Photograph 32). Many contain businesses of the automobile repair industry.

The cross streets intersecting Merrick Boulevard to the east are mainly residential in nature, and the buildings are similar in age to those in other parts of the Architectural APE (Photograph 33).

107th Street

Immediately southeast of the project site, on 107th Street, is a large, seven-story senior citizen complex, which covers most of an entire block (Photographs 34 and 35). The complex was constructed within the last 15 years.

B. Topography and Hydrology

Early maps of the vicinity of the study area record the topography and environment of the study lot prior to nineteenth- and twentieth-century development. The earliest detailed maps of the area, the 1837, 1844, and 1891 topographical surveys, depict the project site as a relatively level area near the head of a perennial tributary of Cornell's Creek (U.S.C.S. 1837 [Figure 5], 1844; Bien and Vermeule 1891 [Figure 8]). Other historic maps

(Sanborn 1897, Bromley 1909, Figure 10) illustrate that the creek ran through the project site, and its irregularly aligned channel formed the later eastern lot boundaries between Lot 46 and the remaining lots fronting Merrick Boulevard.

In its natural state, the project site was generally level. The earliest recorded numerical elevations are derived from topographic maps and real estate atlases. The 1891 topographical map shows that the project site was approximately 40 feet above sea level (Bien and Vermeule 1891 [Figure 8]). The modern U.S.G.S. topographic map shows that the project site ranges from approximately 30-40 feet above sea level. A recently completed topographical survey for the project indicates that elevations range from approximately 27-38 feet above sea level, depending on location (NYCT 2014).[2]

D. Soils

The USDA soil survey for New York City (Figure 3) indicates that the project site falls within an area mapped as "Laguardia-Ebbets-Pavement & buildings complex, 0 to 8 percent slopes." It is described as:

> Nearly level to gently sloping areas filled with a mixture of natural soil materials and construction debris; a mixture of anthropogenic soils which vary in coarse fragment content, with more than 15 percent impervious pavement and buildings covering the surface. (USDA 2005:11).

There have been multiple Phase I Environmental Site Assessments completed for the lots within the project site, including Lot 46 which contains the current JBD. The reports indicate that beginning at least by the 1990s there had been one or more heating and/or diesel oil spills from the JBD. Subsequent spills also have been noted. Currently, there is a plume of contaminated soil and groundwater beneath much of the project site and block, including areas outside the project site boundaries. The JBD project site has been subjected to numerous soil investigations in order to locate and remediate the contaminated soils and groundwater. Since 1995, NYCT has been operating a "pump and treat" remediation system to recover the combined heating oil and diesel fuel release (STV 2012, 2015a-f).

Three sets of soil borings also were reviewed for the project site (Appendix A). The first set of four borings was completed in 1965, within the South Road entrance driveway of the JBD (Raymond International 1965). All of the borings recorded an upper surface layer of concrete. Two of the borings contained fill under the concrete, Boring 2 to a depth of 8 feet below grade and Boring 3 to a depth of 3 feet below grade. The other two borings recorded natural soil, noted as fine brown sand or medium brown sand, beneath the concrete. All borings recorded additional natural soils to the depth of excavation, which generally was about 36 feet below grade. The water table was noted at 34-36 feet below grade.

The second set of five borings was completed in 1986, as part of the JBD rehabilitation of that period (Warren George, Inc. 1986). Borings B-1 and B-2 also were located within the South Road entrance driveway of the JBD, in general proximity to the borings completed in 1965. The two borings from 1986, however, both recorded a thick stratum of fill beneath the concrete surface. Boring B-1 noted 15 feet of fill and Boring B-2 noted 9 feet of fill. Subsoil was recorded beneath the fill layer. Boring B-1 recorded the water table at 27.5 feet below grade. Borings B-3, B-4, and B-5 were situated on the southeastern end of the JBD, in the vicinity of the existing building. All three of these borings also recorded a thick upper fill stratum, measuring 7-8 feet in depth, with natural soils underneath. Here, the water table was recorded at 21.5 feet below grade in Boring B-4. All five borings from 1986 were terminated at 42 feet below grade.

The third set of five borings was completed in 1990, in Lots 80 and 84 of the project site where an underground tank replacement was planned (Warren George, Inc. 1990). These five borings all recorded an upper fill stratum extending from 4.5 to 5 feet below grade, followed by natural soils. The water table was noted at between 12-13 feet below grade. The borings were terminated at 62 or 72 feet below grade.

Results of the soil boring programs indicate that there has been significant grading and filling on the project site, as evidenced by the thick fill stratum in all the recent borings. Although the elevations on the project site have not

[2] The topographical map noted elevations using the NYCT datum, which is 98.45 feet higher than the NAVD 88 datum used on many modern surveys. The elevations have been converted to NAVD 88 values for consistency.

changed notably over time, the natural upper soil strata appear to have been disturbed and either removed or redeposited as fill. The fluctuations in the water table depth over time may be due to both seasonal changes and also the effect of pumping in the area by the NYCDEC to lower the water table artificially and therefore avoid flooding conditions (Kong, personal communication, 8/2/2016).

IV. BACKGROUND RESEARCH/HISTORICAL OVERVIEW

A. Precontact Summary

For this report, the word precontact is used to describe the period prior to the use of formal written records. In the western hemisphere, the precontact period also refers to the time before European exploration and settlement of the New World. Archaeologists and historians gain their knowledge and understanding of precontact Native Americans in the lower Hudson Valley area from three sources: ethnographic reports, Native American artifact collections, and archaeological investigations.

Based on data from these sources, a precontact cultural chronology has been devised for the New York City area. Scholars generally divide the precontact era into three main periods, the Paleo-Indian (c. 14,000-9,500 years ago), the Archaic (c. 9,500-3,000 years ago), and the Woodland (c. 3,000-500 years ago). The Archaic and Woodland periods are further divided into Early, Middle, and Late substages. The Woodland was followed by the Contact Period (c. 500-300 years ago). Artifacts, settlement, subsistence, and cultural systems changed through time with each of these stages. Characteristics of these temporal periods have been well documented elsewhere, and in keeping with guidelines issued by the NYSOPRHP (2005), will not be fully reiterated here.

Scholars often characterize precontact sites by their close proximity to a water source, fresh game, and exploitable natural resources (i.e., plants, raw materials for stone tools, clay veins, etc.). These sites are often separated into three categories: primary (campsites or villages), secondary (tool manufacturing, food processing), and isolated finds (a single or very few artifacts either lost or discarded). Primary sites are often situated in locales that are easily defended against both nature (weather) and enemies. Secondary sites are often found in the location of exploitable resources (e.g., shell fish, lithic raw materials).

The project site, which originally had a small perennial stream running through the property, in its natural state would have been located in an area hospitable to precontact period occupation.

B. Historic Period Summary

The project site falls within the original boundaries of the Town of Jamaica, chartered in 1660, whose jurisdiction extended from the southern foothills of the moraine, to the meadowlands and shores of Jamaica Bay (Munsell 1882:195). What is now known as Jamaica Avenue was originally a Native American trail, and provided early east-west access through the area; the former Rockaway Turnpike ran north-south from Jamaica Avenue, roughly paralleling Beaver Creek, to Jamaica Bay. Both South Street, as it was originally called, and Merrick Boulevard were in place by the late eighteenth century (Taylor and Skinner 1781).

The former creek that ran through the project site formed the division between two large land parcels located southwest of the intersection of South Street and Merrick Boulevard prior to the creation of the present city street grid. On the west side of the creek were the large landholdings of the Denton family, who were some of the earliest settlers in Jamaica. These lands were subdivided over time to create smaller parcels. The project site lots west of the creek belonged to Jonathan Denton until 1762, when the area was sold to Thomas Blaine. Land on the east side of the creek belonged to the members of the Smith family, for whom nearby Smith Street was named (Topographical Bureau 1935).

Historic maps indicate that there was one structure within the project site during the late eighteenth and nineteenth centuries, at the corner of what would become South Street and 165th Street on Lot 41, but which during the historic era was part of a larger parcel that included several modern city blocks. This structure appears on numerous maps, beginning with the 1781 Taylor and Skinner map, and continuing on the 1837 U.S.C.S. map (Figure 5), the 1849 Sidney map, the 1852 Conner map, the 1859 Walling map (Figure 6), the 1873 Beers atlas (Figure 7), the 1891 Wolverton atlas (Figure 9), and the 1891 and 1897 Sanborn maps. When labeled, the building was attributed to

Powell (1852), Jno Phruner (1859), Jno. Case estate (1873), and J. Case estate (1891). The building, a frame dwelling, continued to be shown on twentieth century historic maps through the 1950s (Bromley 1909 [Figure 10]; Sanborn 1901, 1912, 1926 [Figure 11], 1951 [Figure 12]). Several outbuildings associated with the house were present as well, one in or near what is now Lot 46 and the other outside of the project site boundaries, prior to creation of 165th Street in the late 1890s. The house was demolished by the 1960s.

The remainder of the project site stayed undeveloped through most of the nineteenth century, as depicted on the above maps and atlases. At least by the 1890s, however, a saloon had been constructed at the southwest corner of South Street and Merrick Boulevard within Lot 53 of the project site, and a blacksmith shop had been constructed on Lot 60 (Sanborn 1891). The 1891 Wolverton atlas (Figure 9) shows that by this period, some of the other lots along Merrick Boulevard were beginning to be developed with small frame buildings, which on later Sanborn maps are labeled as dwellings.

After Queens became a borough of New York City in 1897, a new street grid was imposed and development increased in the vicinity. What is now 165th Street was originally called Highview Avenue, and was opened after 1897. The initial name of 107th Avenue was Sampson Street; it was laid out after the turn of the twentieth century but originally ran only from Merrick Boulevard (then called the Merrick Plank Road) to the creek that bisected the project block (Sanborn 1901; Bromley 1909, Figure 10). The remaining portion of 107th Street west of the creek to 165th Street was not regulated and opened until the early 1920s (Ullitz 1918, Sanborn 1926, Figure 11). During the first decades of the twentieth century, South Street was renamed South Road.

During the twentieth century the project site was divided into individual relatively uniform building lots, each of which had its own history. Table 1, below, summarizes the sequence of building and demolition episodes on each of the 19 project site lots, utilizing Sanborn maps from 1901, 1926, and 1951, and last, recapping the current conditions of each lot.

Table 1: Twentieth-century project site history summary

Lot	1901 Sanborn	1926 Sanborn (Figure 11)	1951 Sanborn (Figure 12)	2016/2019 conditions
41	Dwelling	Dwelling	Dwelling (razed in 1960s)	Warehouse, built 1994
46	Vacant	Vacant	Bus depot	Bus depot
53	Large store and shop (saloon on 1891 and 1897 Sanborn maps)	Two buildings for filling station, buried tanks, store	Enlarged filling station, car wash, buried tanks, lacquer paint building, additional building	2016: Smaller auto repair shop, commercial store by 1996, building now unused. 2019: Vacant, used for parking
60	Blacksmith shop	Garage	Part of store	2016: With 61, auto repair and wash, now unused 2019: Vacant, used for parking
61	Vacant	2 dwellings	Part of store, buried gas tanks	2016: With 60, auto repair and wash, now unused 2019: Vacant, used for parking
63	Vacant	Store and rear building	2 dwellings, 2 auto repair shops in rear (welding)	2016: 1-story warehouse built 1987, covers entire lot, now unused 2019: Vacant, used for parking
66	Dwelling and outbuilding	Store, dwelling, 2 outbuildings	2 stores, 1 garage outbuilding	2016: 1-story warehouse, built 1969, covers entire lot, now unused 2019: Vacant, used for parking
68	2 dwellings, 1 outbuilding	3 dwellings, 1 outbuilding	2 dwellings, 1 iron works, 2 garages	1-story warehouse, built 1960s, covers entire lot, now unused
72	2 dwellings	2 dwellings	Vacant	1-story salvage depot, covers nearly entire lot, now unused
74	1 dwelling	Store, tile storage building	Auto repair over entire lot	1-story auto parts manufacturing, covers entire lot

Lot	1901 Sanborn	1926 Sanborn (Figure 11)	1951 Sanborn (Figure 12)	2016/2019 conditions
76	Vacant	Store, part of dwelling	Paint store	2016: Vacant 2019: New one-story building under construction
79	Vacant	2 stores, part of dwelling, rear building	2 stores, junk shop, buried gas tank	1-story L-shaped building, covers entire lot, currently contains Domino's Pizza
80	Dwelling, 2 outbuildings	Dwelling, shed, garage	Store, woodworking shop, lumber storage	Bus parking lot, one small brick office buildings
84	2 dwellings	2 stores, shed	Large filling station, buried gas tanks, rear garage	Bus parking lot, no buildings
89	Vacant	Store	Upholstery shop	3-story building
90	Vacant, no street yet	Large corner building	Woodworking shop and showroom over entire lot	1-story warehouse, covers entire lot
95	Vacant, no street yet	Church (originally built as a dwelling by 1912)	Church	Shown again as a dwelling from 1981-1987, lot now vacant
97	Vacant, no street yet	5 dwellings (shown by 1912)	5 dwellings, 2 outbuildings	Vacant by 1981, now part of bus parking lot
103	Vacant, no street yet	Vacant	Vacant	Vacant, now part of bus parking lot

The JBD itself was built in 1939 and later was expanded, in 1950, to add the bus wash area and provide additional storage area. In 1968, Transportation Offices and locker rooms were constructed on the north side of the facility on an upper mezzanine level. The JBD was rehabilitated in the mid-1980s. The present boiler room was constructed in 2010, replacing a basement-level boiler room that has been filled in and sealed.

C. Archaeological and Historic Sites and Surveys

Research conducted using materials from the NYSOPRHP, the LPC, and the library of HPI revealed no precontact archaeological resources specifically mapped within the project site. However, the project site does fall within the large Historic Jamaica Village archaeological site, which is mapped as extending over multiple blocks in the downtown Jamaica area. The boundaries of this area are roughly 108th Avenue on the south, Merrick Boulevard on the east, Sutphin Boulevard on the west, and Hillside Avenue on the north. Several other archaeological sites also have been documented within a one mile radius of the project site. The sites are listed in Table 2, below.

Table 2: Archaeological sites within a one mile radius of the project site

Site Number	Site Name/Description	Location	Site Type/Time Period
NYSM 7460 A08101.000104	Historic Jamaica (BRK 2-2)	Large area of Jamaica Center, includes project site	Historic Village
NYSM 4546	None	Large area north of Jamaica Avenue	Traces of Occupation, unknown precontact
A08101.009571 A08101.000152 Boesch 74	One Jamaica Center Site (Block 10100)/GSA Site	Archer Ave. and Parsons Blvd.	Late 18th – 19th centuries
Boesch 73a	Captain Tilly Park	Captain Tilly Park	Possible Middle Woodland component
Boesch 76	None	Unprovenienced sites near Morris Park	Unknown precontact
Boesch 78	Rufus King Park	Rufus King Park	Unknown precontact in fill deposits

Additionally, Archaeologist/Historian Robert S. Grumet notes the presence of a Native American trail along modern Jamaica Avenue and the former Rockaway Turnpike, both located several blocks from the project site (Grumet 1981). Last, the NYSOPRHP GIS database identifies the project site as within an area of archaeological sensitivity, based on proximity to other known sites, as does the archaeological sensitivity study of Queens prepared for the LPC (Boesch 1997).

D. Architectural Resources

In order for a cultural resource to be considered eligible for the S/NRHP, at least one criterion for evaluation must be met. The S/NRHP Criteria for Evaluation are:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> B. That are associated with the lives of significant persons in our past; or
>
> C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> D. That have yielded or may be likely to yield, information important in history or prehistory.

There are no previously recorded architectural resources within a 400-foot radius of the project site that are eligible or listed on the State/National Register of Historic Places (S/NRHP) or are a New York City Landmarked resource. The present Jamaica Bus Depot itself, although greater than fifty years old, does not appear to be eligible for the S/NRHP, as it does not meet any of the above criteria.

The project site neighborhood contains housing stock and commercial buildings dating to the first decades of the twentieth century. Based on the site visit as part of this project, no buildings or structures were observed that appear to meet the above criteria for individual listing in the S/NRHP or as a NYC Landmark. Additionally, there are no groups of buildings or structures that appear to meet criteria for eligibility as an S/NRHP historic district.

V. CONCLUSIONS

A. Disturbance Record

Disturbance within the archaeological APE includes several types. In its natural state, the property was a generally level parcel with a creek running through it. As development of the area increased, various residential, and later, commercial and industrial buildings were constructed on the different site lots. The creek was filled in after the turn of the twentieth century.

The JBD was constructed in stages beginning in 1939, on land that previously was vacant. The original construction included a ca. 18-foot deep cellar area for the boiler room located within the interior portion of the building, which was abandoned and backfilled when a new first-floor level boiler room was constructed near the Tuskegee Airmen Way end of the building. Although there is not a full basement level at the JBD, there are multiple subgrade disturbances across the parcel from:

- underground fuel and other utility tanks;
- buried fuel, water, sewer, and other utility conduits;
- bus wash drainage lines;
- long, narrow subsurface pits for bus washing and servicing; and,
- construction and renovations of the existing building.

There also have been multiple episodes of building construction, demolition, and subsequent construction on most of the project site lots not covered by the JBD. The Merrick Boulevard frontage of the project site originally contained residences and stores, but now contains nearly all commercial and industrial buildings, including warehouses. During the twentieth century there were multiple buried fuel tanks associated with filling stations on Lots 53, 60, 80 and 84 (Sanborn 1951, Figure 12). Most of the former and existing buildings on Merrick Boulevard do not have basements, with the exception of the warehouse on Lot 68, the tire store warehouse on Lot 74, and the multiple-story former apartment/commercial building on Lot 89. The warehouse on Lot 41 at the corner of Tuskegee Airmen Way and 165th Street does not have a basement.

Last, there is an active fuel spill on much of the JBD block, including the project site, which has been monitored over the course of ca. 25 years but cannot be fully remediated due to the ubiquity of the spill throughout the project site soils.

B. Precontact Archaeological Sensitivity

From what is known of precontact period settlement patterns on in New York City and Long Island, most habitation and processing sites are found in sheltered, elevated sites close to wetland features, major waterways, and with nearby sources of fresh water. In its natural condition, the project site had a small creek running through it. Combined with its level terrain, the project site would have represented a favorable location for Native American settlement.

However, as described above, the project site has experienced substantial disturbance that appears to have destroyed much if not all of the soils in the upper reaches of the soil column, where precontact period archaeological sites normally are located. The soil borings indicate that the upper reaches of the present soil column consists entirely of fill. Although the soil borings do not indicate the origin of the fill, it is likely that the fill is actually original site soils that were disturbed from excavation and then redeposited. None of the soil borings recorded any strata that appear to correspond to an original A or B horizon (or even a buried A or B horizon), where precontact resources generally are found.

Based on these factors, the project site now is considered to have a low potential for hosting precontact cultural remains.

C. Historic Period Archaeological Sensitivity

The project site contained one structure, on Lot 41, which stood from at least the late eighteenth century through the 1960s. This dwelling was located on a large tract south of Tuskegee Airmen Way prior to implementation of the present city grid and creation of blocks and lots. The house was attributed to variously to Powell (1852), Jno Phruner (1859), Jno. Case estate (1873), and J. Case estate (1891). Today, the area where the house once stood is covered by a large warehouse, constructed in 1994. There is no visible evidence of any potential archaeological resources associated with this former house on the project site. Although the current warehouse does not have a basement level, soil borings from other parts of the project site indicate that even in areas that did not have basement excavation, there is widespread and extensive disturbance from grading and filling associated with multiple episodes of construction and demolition across the site.

The remainder of the project site remained undeveloped through the 1880s. By the early 1890s, there was a saloon on Lot 53 and a blacksmith shop on Lot 60. The rest of the project site lots began to be developed during the 1890s and first decades of the twentieth century, generally with houses and small stores. Over time, the initial buildings on the project site were demolished and larger stores and warehouses were constructed in their places.

Given the level of disturbance across the project site lots, as described above, HPI concludes that there is little to no historic period archaeological sensitivity on the project site.

D. Architectural Resources

HPI concludes that there are no architectural resources on or within a 400-foot radius of the project site that are eligible or listed on the State/National Register of Historic Places (S/NRHP) or are a New York City Landmarked resource. The JBD does not appear to meet criteria for S/NRHP eligibility, nor do any of the buildings or structures within the Architectural APE.

VI. RECOMMENDATIONS

HPI has determined that there is no remaining precontact or historic period archaeological sensitivity on the project site. No additional archaeological investigations are recommended and there are no additional historic resources concerns for the project site.

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FIGURES

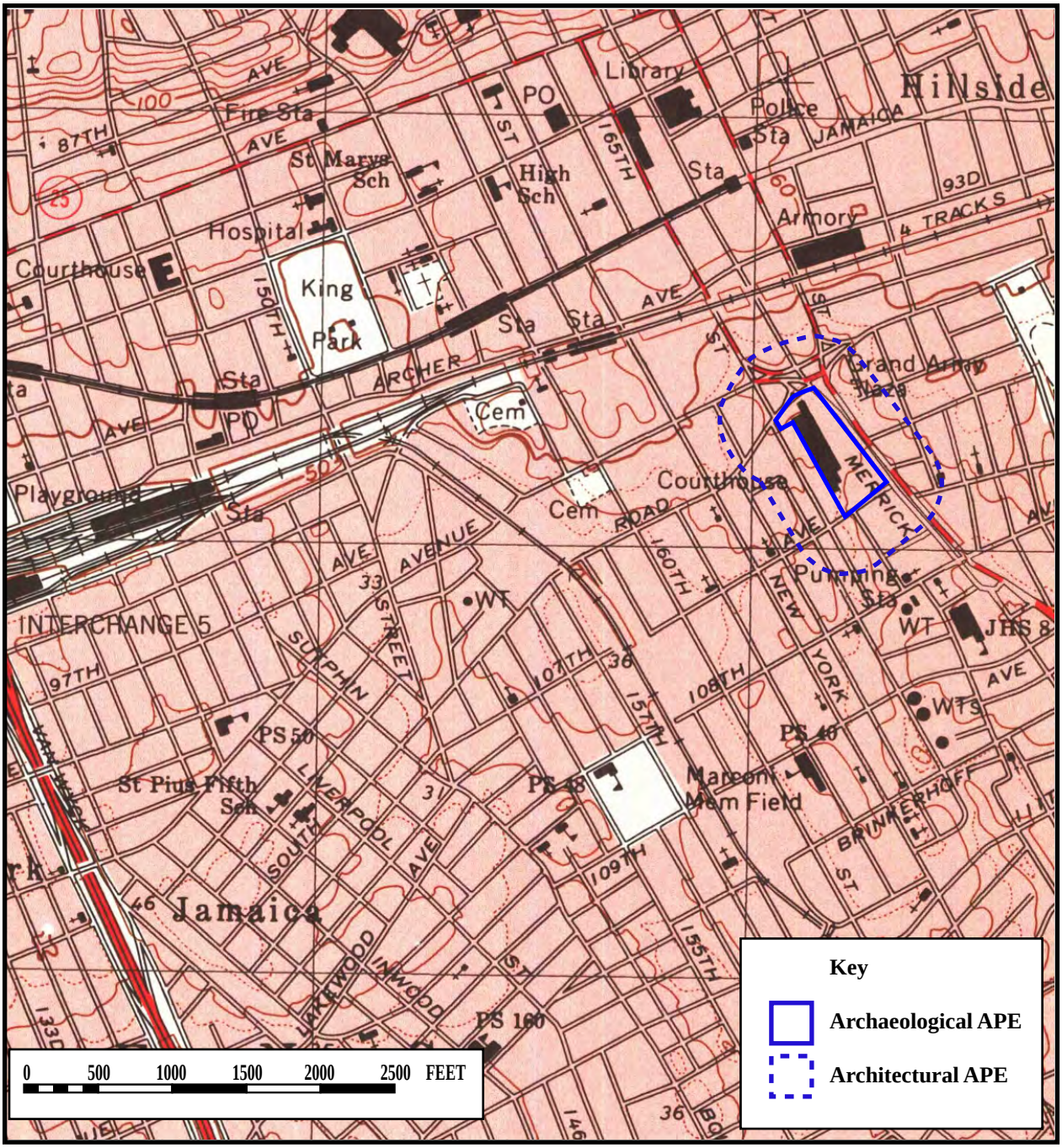

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Figure 1: Archaeological APE and Architectural APE on *Jamaica, New York* 7.5 Minute Quadrangle (U.S.G.S. 1994).

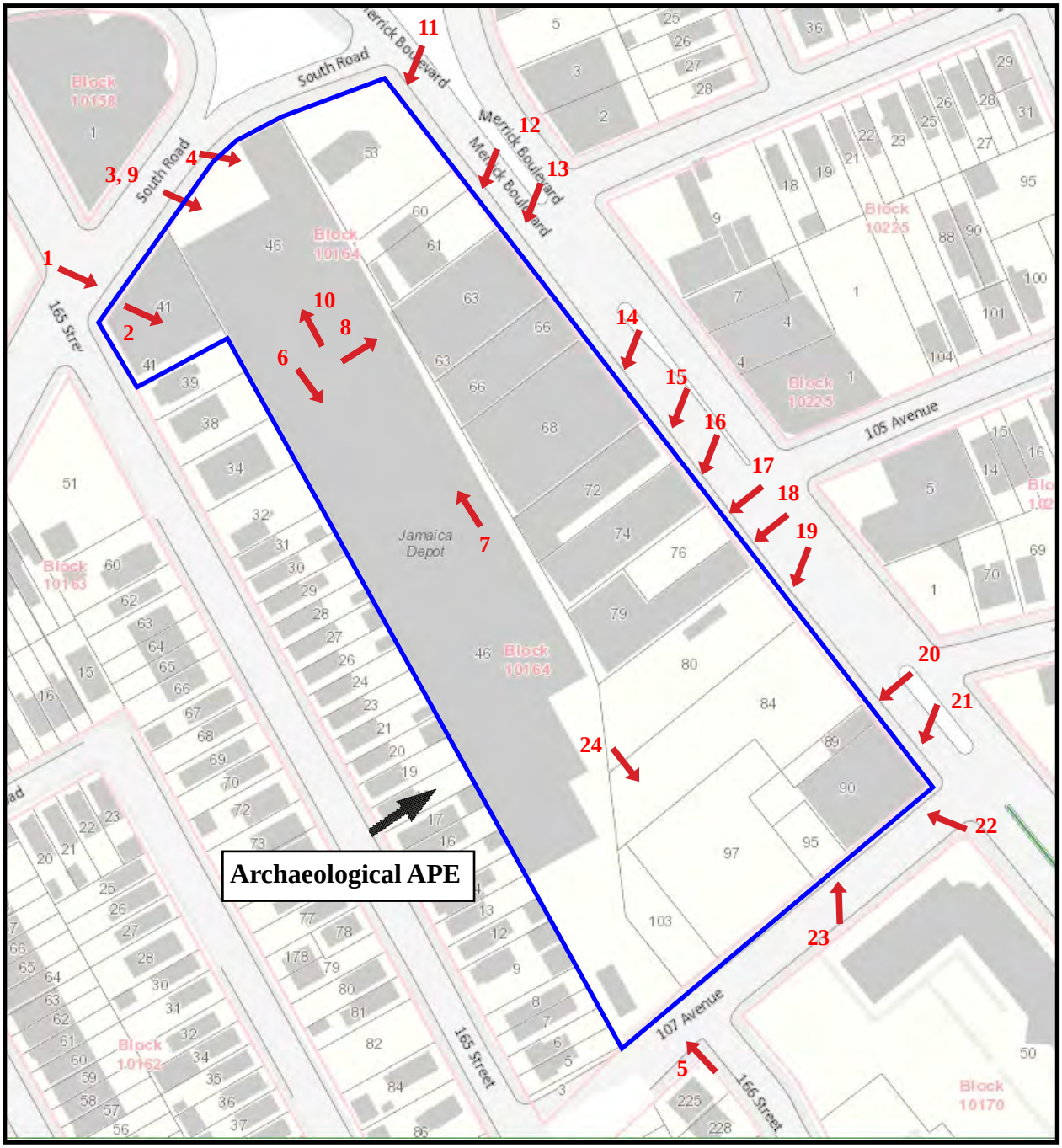

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Figure 2: Archaeological APE and photograph locations on NYC Oasis map with lot divisions.

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Figure 3: Archaeological APE, Architectural APE, and additional photograph locations on modern aerial photograph (Oasis 2014).

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Figure 4: Archaeological APE on *New York City Reconnaissance Soil Survey* (U.S.D.A. 2006).

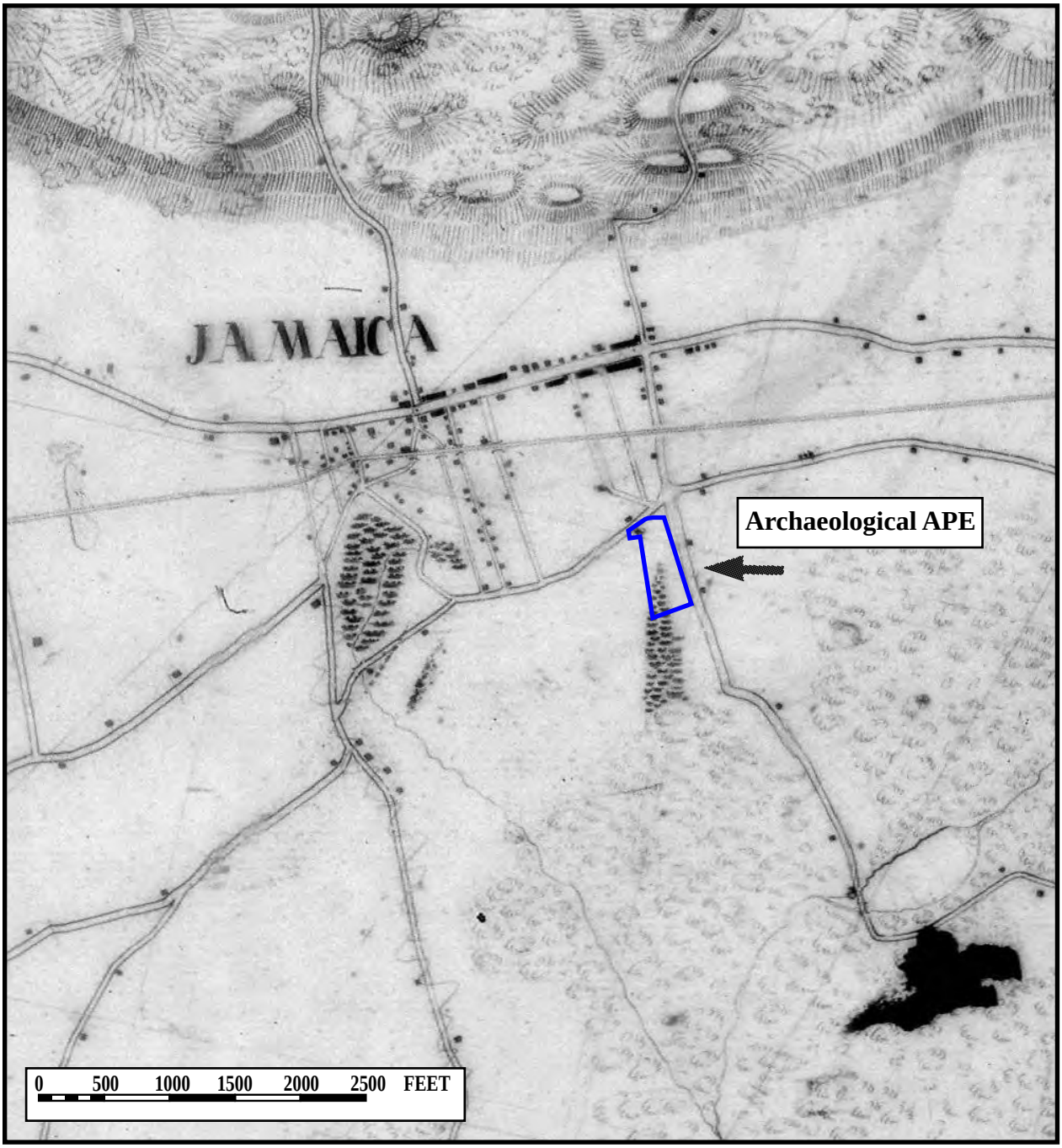

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Figure 5: Archaeological APE on *U.S. Coast Survey Map of the Interior of Long Island from Brooklyn to Jamaica, New York* (U.S.C.S. 1837).

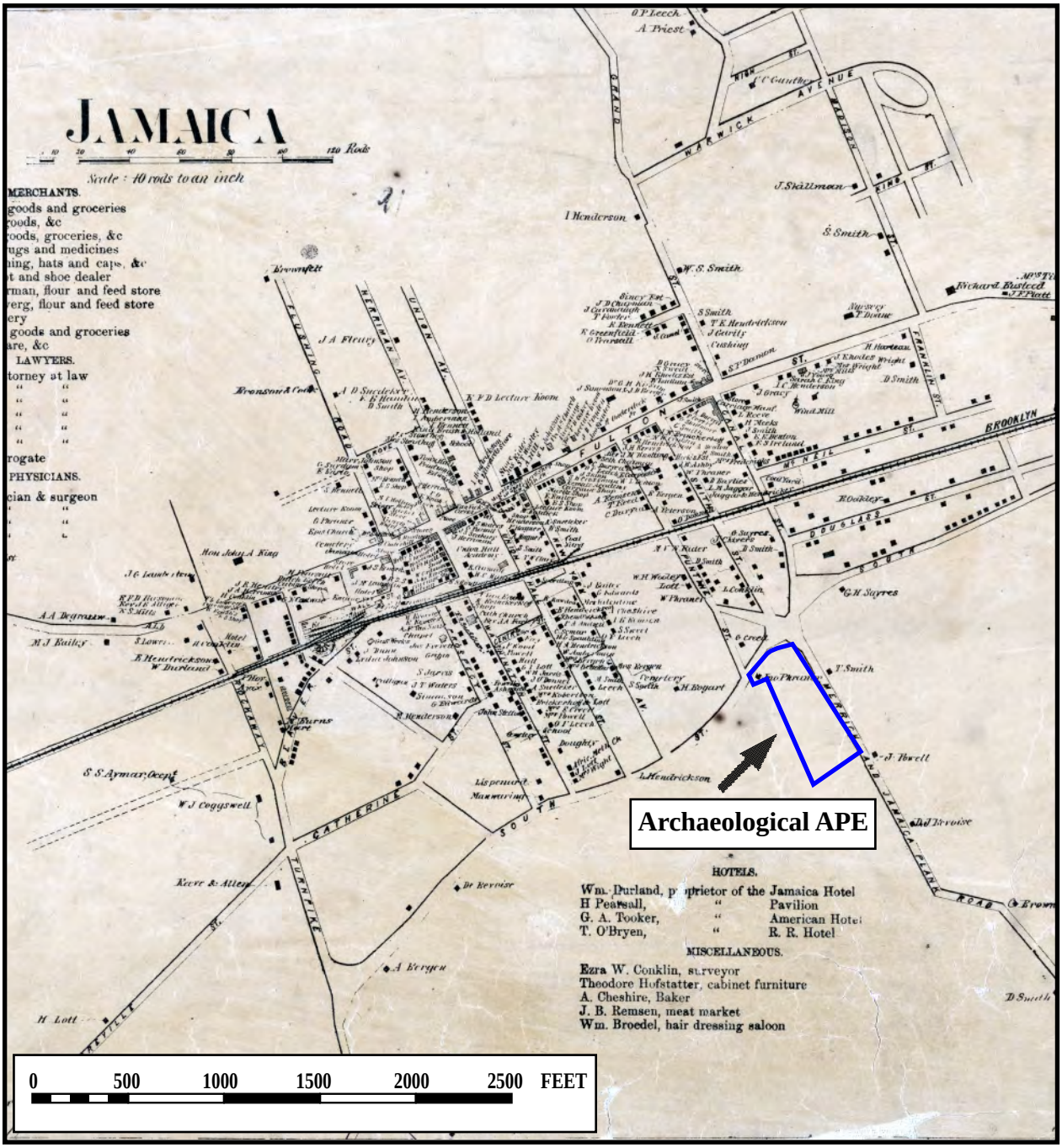

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Figure 6: Archaeological APE on *Topographic Map of the Counties of Kings and Queens, New York* (Walling 1859).

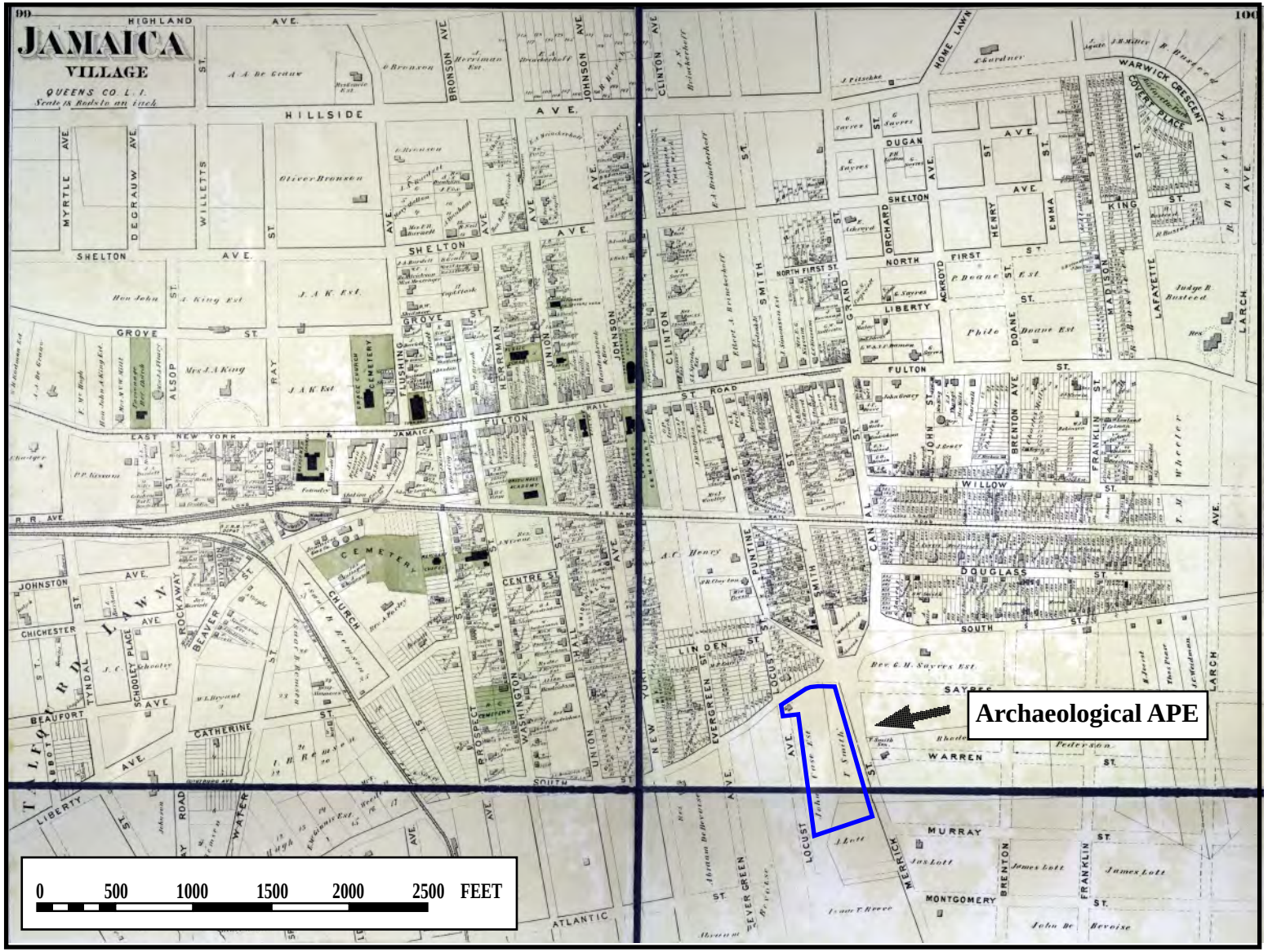

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Figure 7: Archaeological APE on *Atlas of Long Island, New York* (Beers 1873).

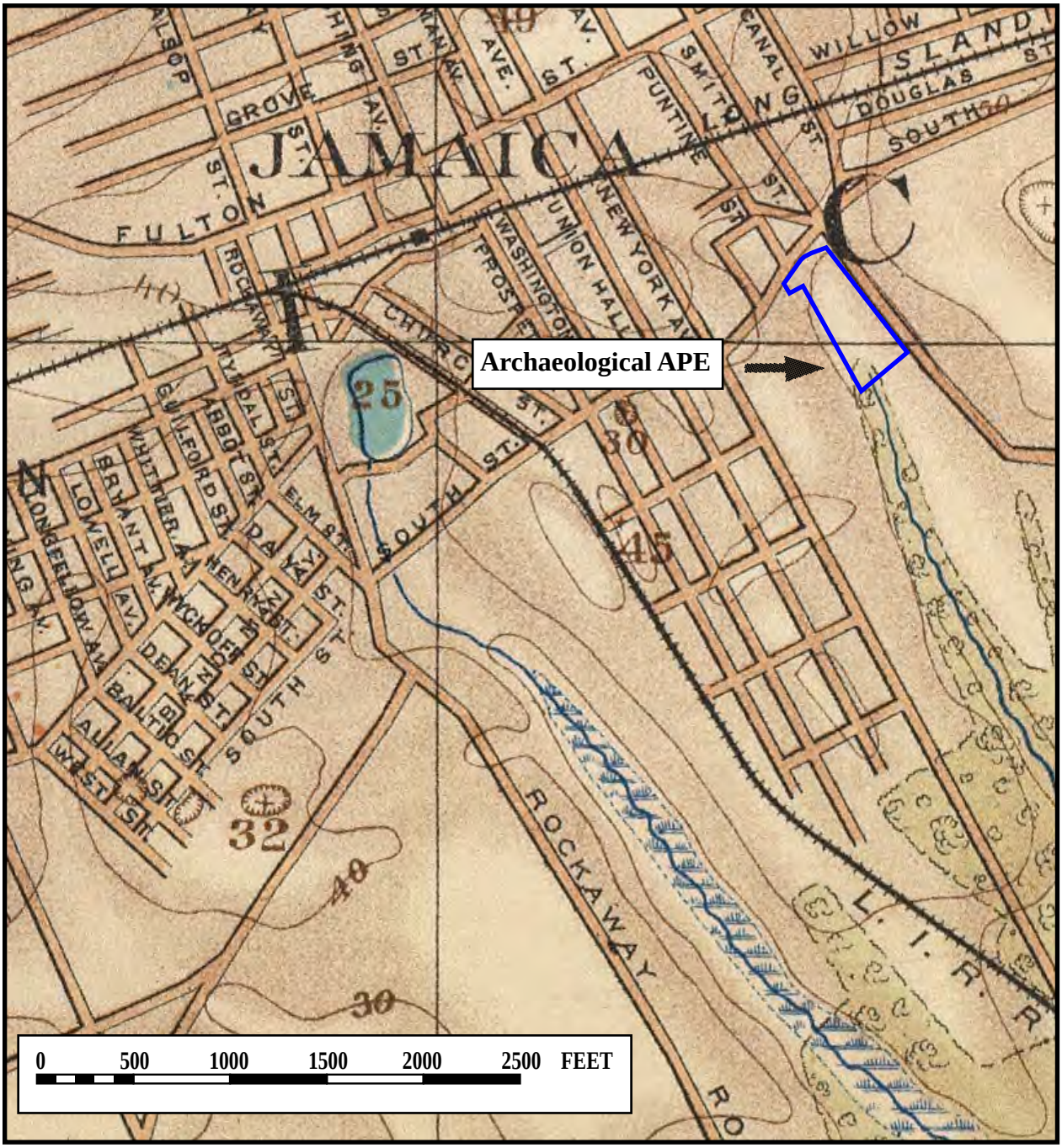

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Figure 8: Archaeological APE on *Atlas of the Metropolitan District and adjacent country...* (Bien and Vermeule 1891).

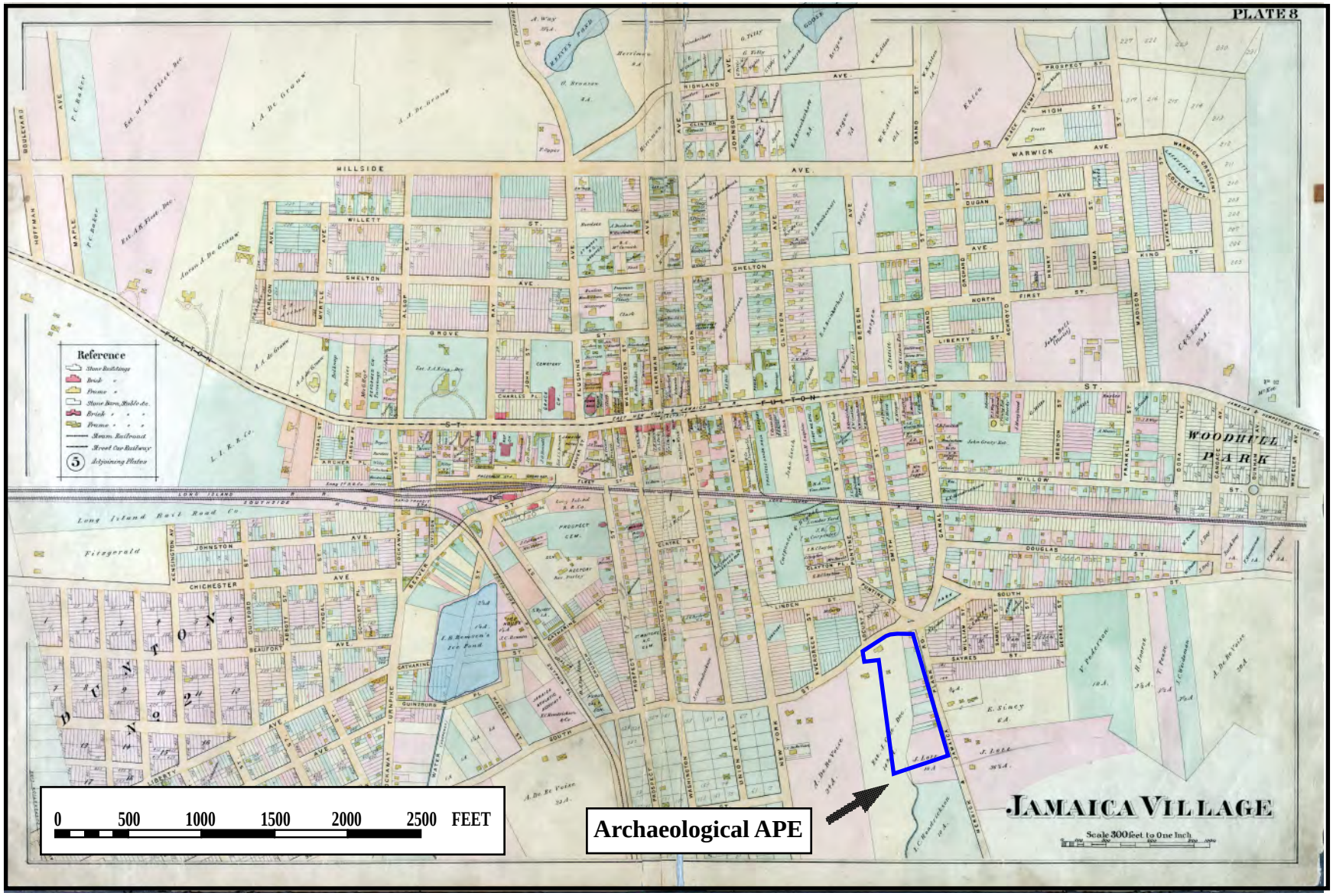

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Figure 9: Archaeological APE on *Atlas of Queens County, Long Island, New York* (Wolverton 1891).

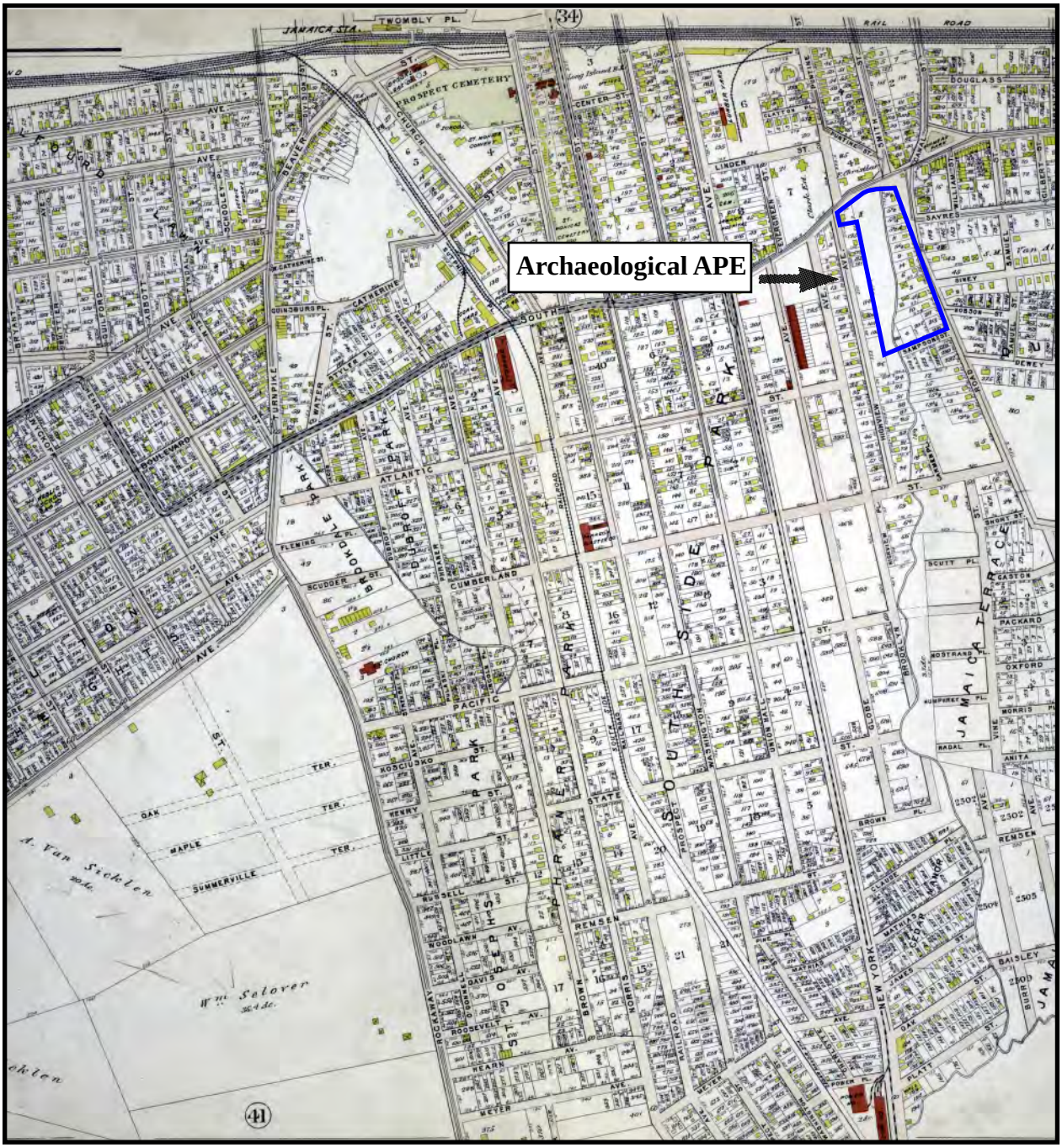

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Figure 10: Archaeological APE on *Atlas of the City of New York* (Bromley 1909).

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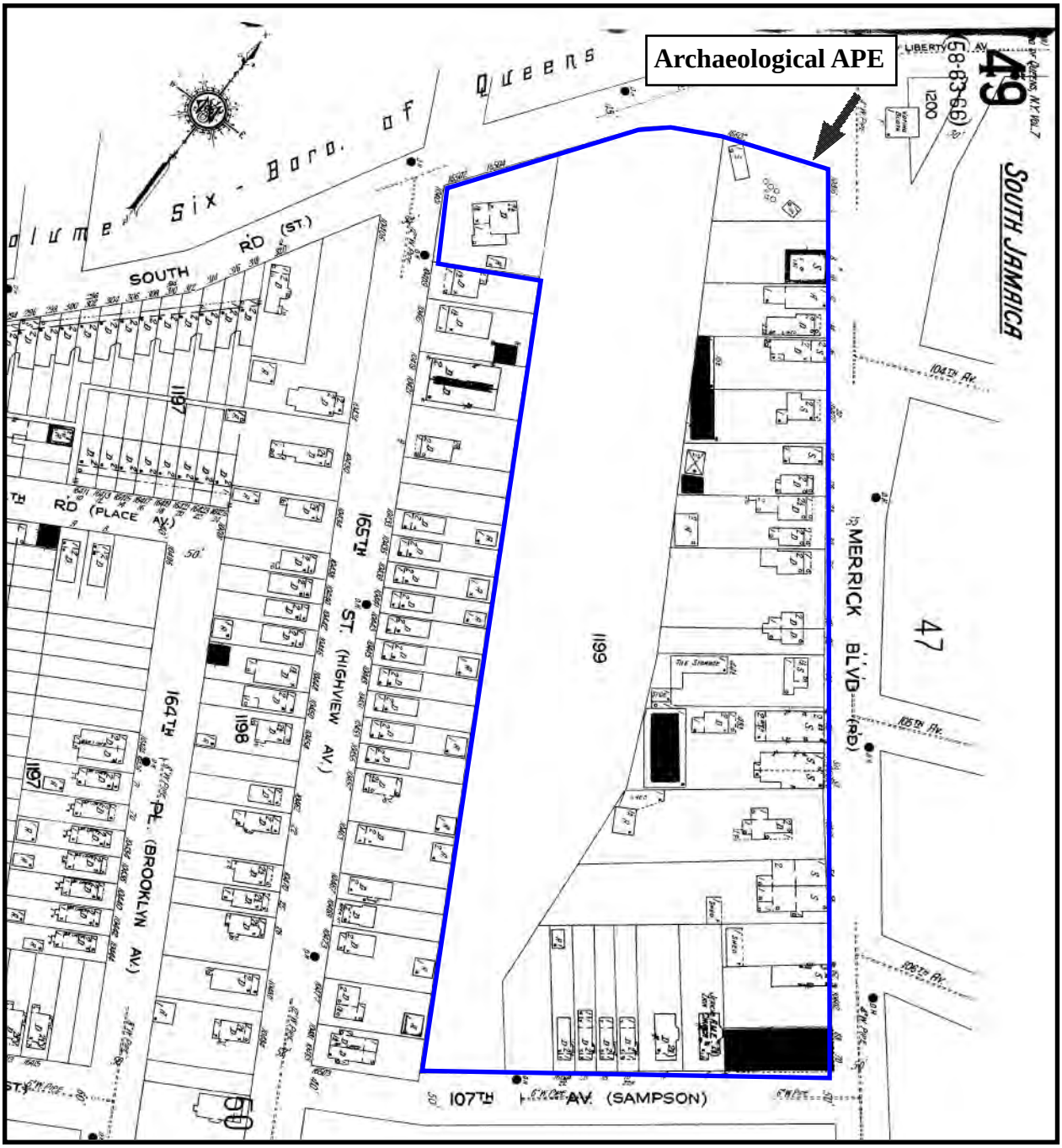

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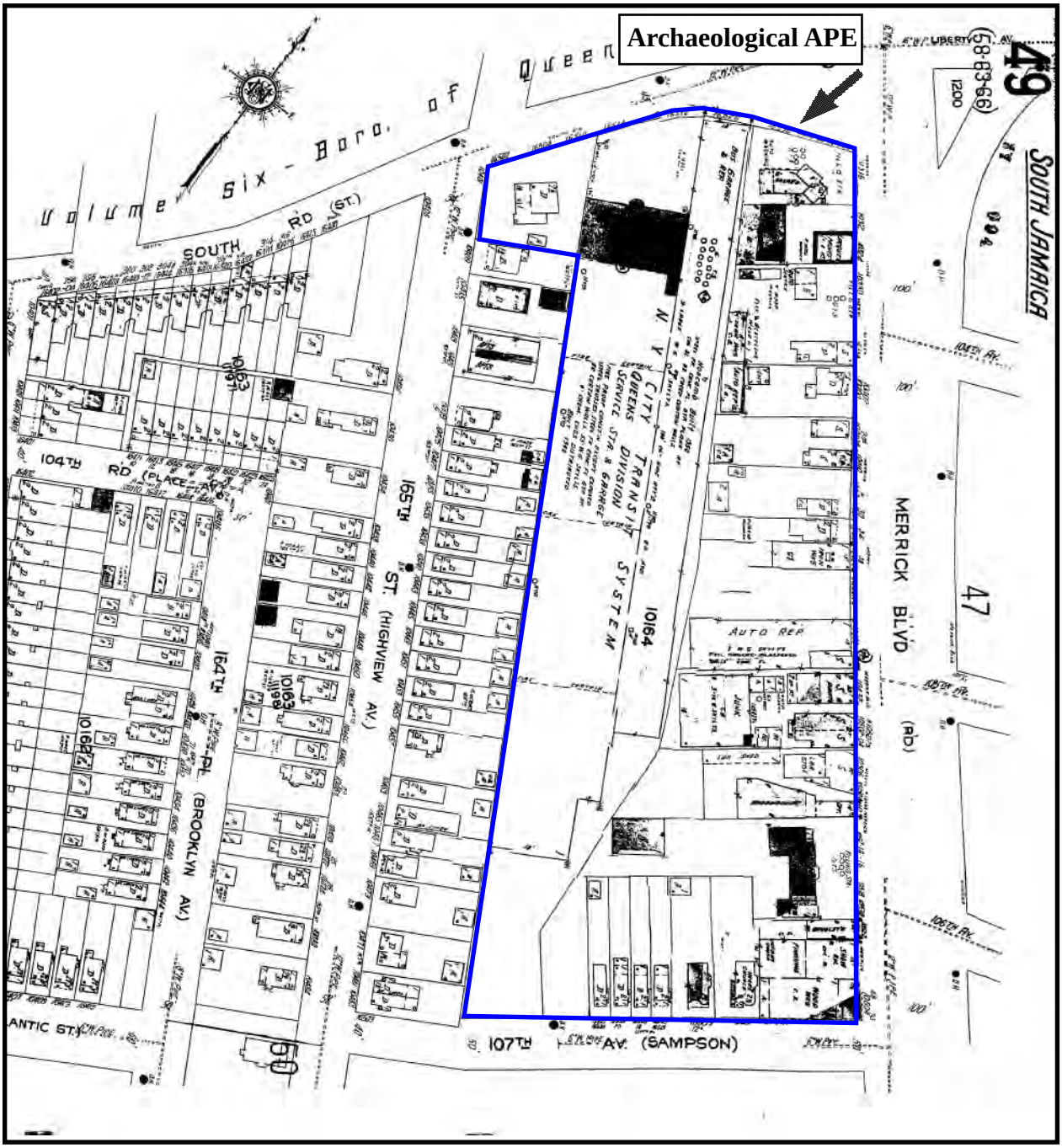
Figure 11: Archaeological APE on *Insurance Maps of the Borough of Queens, New York* (Sanborn 1951).

0 100 200 300 400 500 FEET



Phase IA Cultural Resources Assessment
Reconstruction and Expansion Project
Jamaica Bus Depot
165-18 Tuskegee Airmen Way, Jamaica NY 11433
Queens County, New York

Figure 12: Archaeological APE on *Insurance Maps of the Borough of Queens, New York* (Sanborn 1951).

0 100 200 300 400 500 FEET

PHOTOGRAPHS

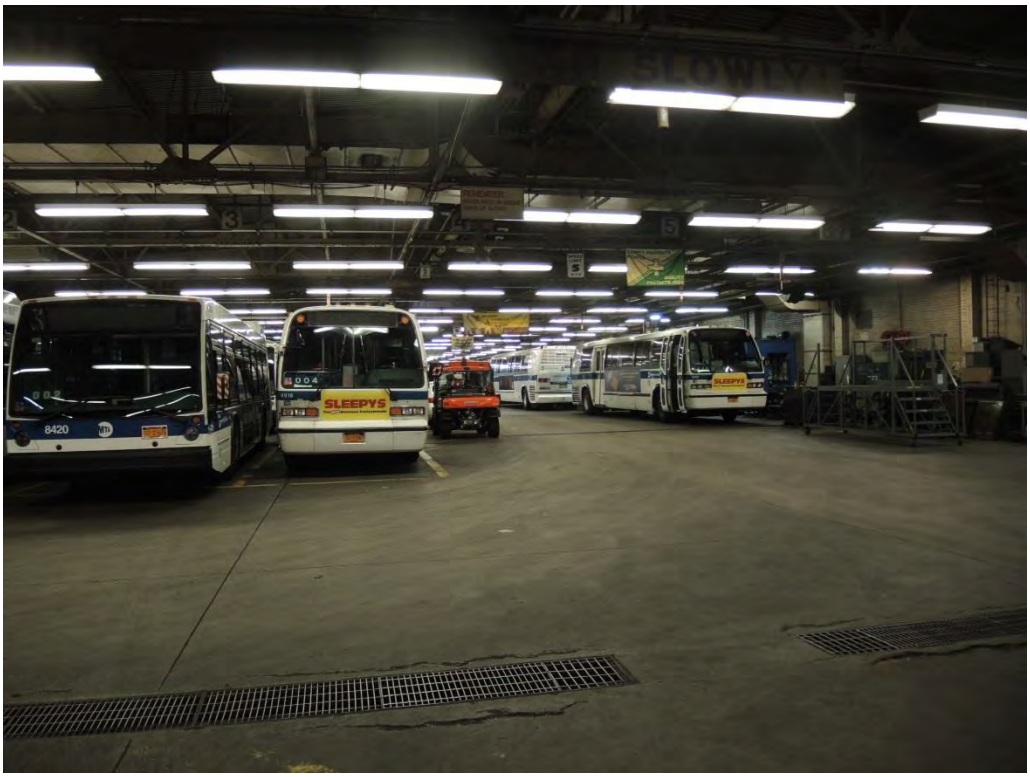
Photograph 1: Lot 41 warehouse building. View looking southeast from Tuskegee Airmen Way.

Photograph 2: Lot 41, interior of warehouse building. View looking southeast.

Photograph 3: Lot 46, Tuskegee Airmen Way entrance of Jamaica Bus Depot. View looking southeast from Tuskegee Airmen Way.

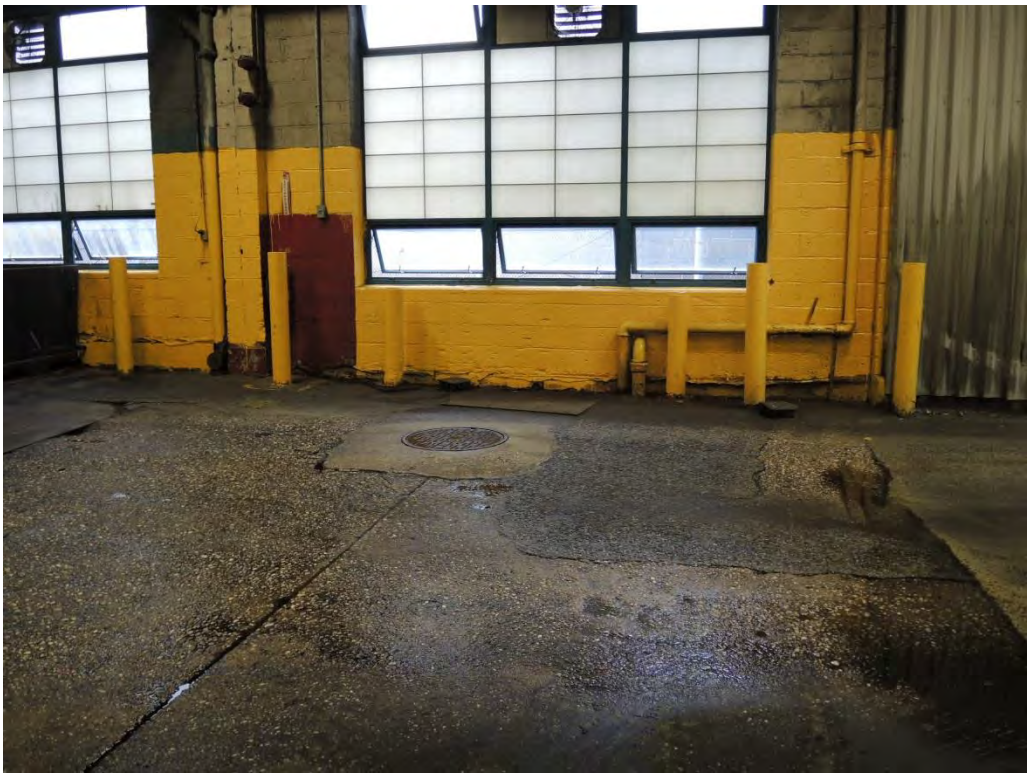
Photograph 4: Lot 46, location of present first-floor boiler room in brick wing of Jamaica Bus Depot facing Tuskegee Airmen Way. View looking southeast from Tuskegee Airmen Way.

Photograph 5: Lot 46, rear of Jamaica Bus Depot. Manhole in street marks approximate former location of creek channel, which ran along the northeastern side of Lot 46. View looking northwest from 107th Avenue.

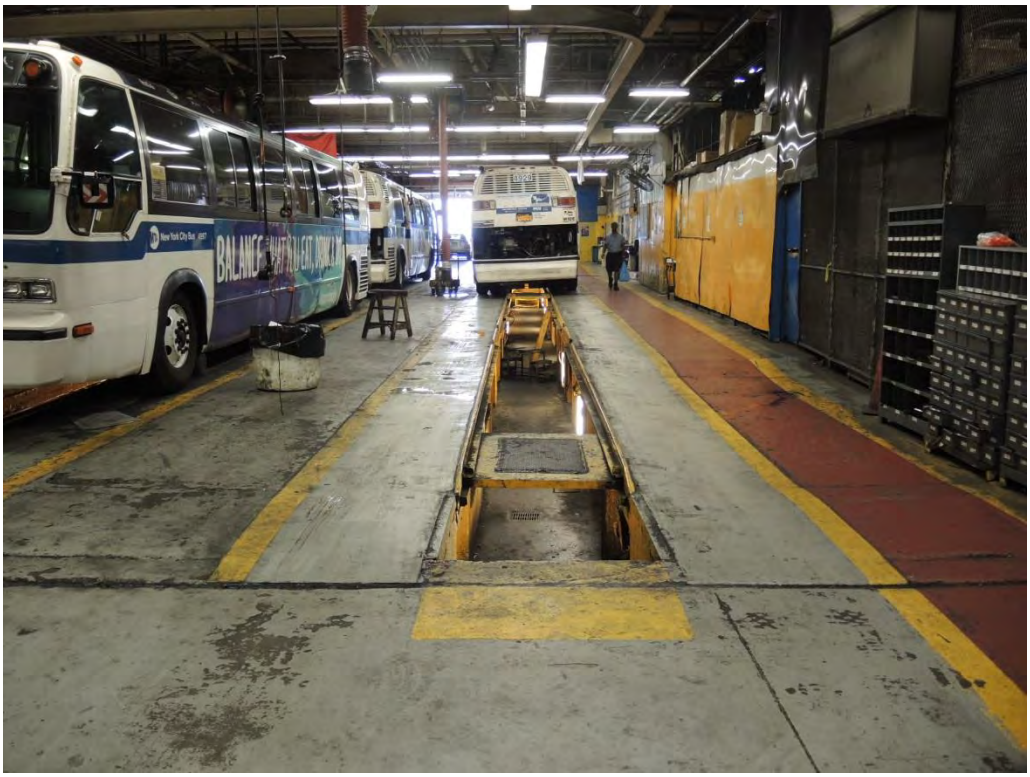


Photograph 6: Lot 46, interior of main section of Jamaica Bus Depot. View looking southeast.


Photograph 7: Lot 46, interior of bus wash area of Jamaica Bus Depot. Note drainage grates in foreground. View looking northwest.


Photograph 8: Lot 46, location of filled in former basement level. View looking northeast.

Photograph 9: Lot 46, detail of manholes and grates leading to buried tanks and other subsurface utilities at Tuskegee Airmen Way entrance to Jamaica Bus Depot. View looking southeast from Tuskegee Airmen Way.



Photograph 10: Lot 46, example of subgrade pit for bus maintenance. View looking northwest.

Photograph 11: Lot 53, parking area and location of former Kelly's Family Restaurant building. View looking southwest from Merrick Boulevard.


Photograph 12: Lots 60 and 61, parking area and location of former automobile repair lot. View looking southwest from Merrick Boulevard.

Photograph 13: Lots 63 and 66, parking area and former locations of warehouse buildings. View looking southwest from Merrick Boulevard.

Photograph 14: Lot 68, warehouse building. View looking southwest from Merrick Boulevard.

Photograph 15: Lot 72, warehouse building. View looking southwest from Merrick Boulevard.

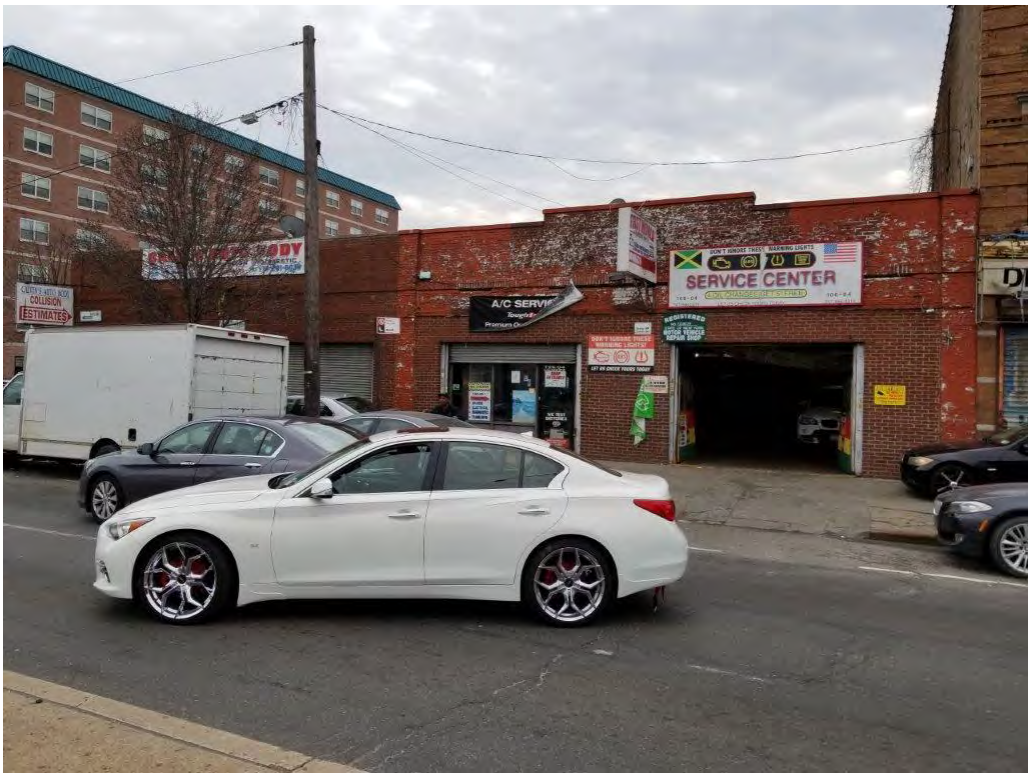
Photograph 16: Lot 74, automobile tire shop. View looking southwest from Merrick Boulevard.


Photograph 17: Lot 76 showing new building under construction. View looking southwest from Merrick Boulevard.


Photograph 18: Lot 79 showing vacant building and driveway. View looking southwest from Merrick Boulevard.

Photograph 19: Lots 80 and 84, bus parking area (note one-story brick office on Lot 80 on right). View looking southwest from Merrick Boulevard.

Photograph 20: Lot 89, three-story building. View looking southwest from Merrick Boulevard.



Photograph 21: Lot 90, commercial buildings. View looking southwest from Merrick Boulevard.

Photograph 22: Lot 90, commercial buildings. View looking northwest from 107th Avenue.

Photograph 23: Lot 95, vacant lot. View looking north from 107th Avenue.


Photograph 24: Lots 97 and 103, bus parking area. View looking southeast.

Photograph 25: Representative housing stock, 165th Street abutting project site. View looking north.

Photograph 26: Brick wall of Jamaica Bus Depot (in background) abutting residential lots on 165th Street. View looking northeast.

Photograph 27: Present Rose of Sharon Baptist Church (former apartment building) at 104-19 165th Street. Ivy covered wall in right background marks edge of bus depot lot. View looking north.

Photograph 28: Row houses on Tuskegee Airmen Way west of 165th Street. View looking southwest.

Photograph 29: York College property at northwest corner of Tuskegee Airmen Way and 165th Street. View looking northwest.

Photograph 30: Storage facility building across from Jamaica Bus Depot on triangular block bounded by Tuskegee Airmen Way, 165th Street, and Liberty Avenue. Lot 41 of project site is in far background. View looking southeast.

Photograph 31: Commercial buildings at northwest intersection of Liberty Avenue and Merrick Boulevard. View looking northwest.

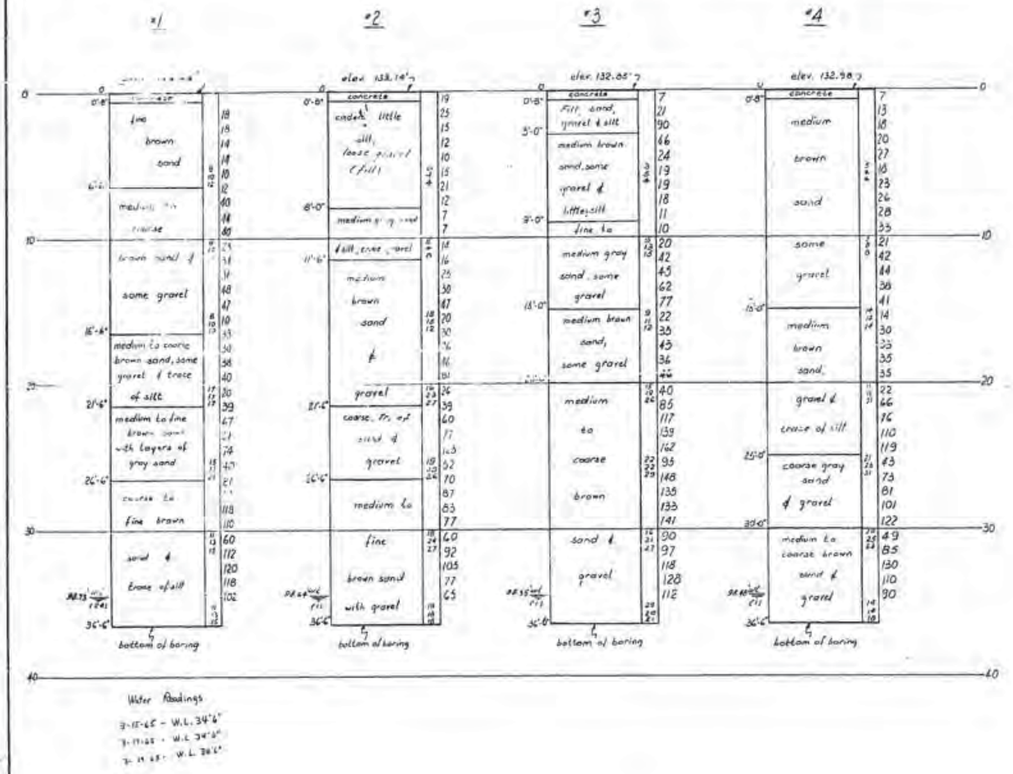
Photograph 32: Merrick Boulevard, with commercial buildings on left across from project site on right. View looking southeast.

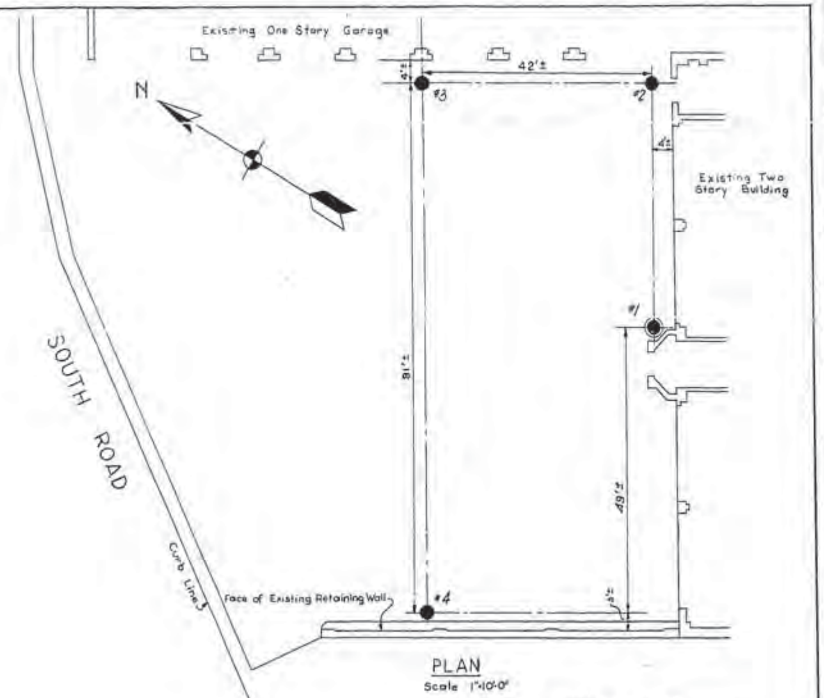
Photograph 33: Representative building stock in project site vicinity on 106th Avenue east of Merrick Boulevard. View looking northeast.

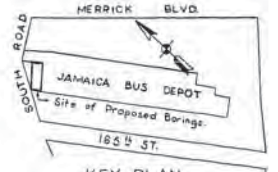
Photograph 34: Senior housing complex on southwest corner of Merrick Boulevard and 107th Avenue, across from project site. View looking south.

Photograph 35: 107th Avenue, with project site on left and senior housing complex on right. View looking northeast.

APPENDIX A: SOIL TESTING PROGRAM RESULTS







KEY PLAN
Not to Scale

Notes:
1) Figures in right hand column indicate number of blows required to drive 2"O.D. sample spoon 6" using 140# weight falling 30 inches.
2) Figures on outside of right hand columns are blows per foot to drive casing 2½", using weight averaging 340# falling average of 24 inches.
3) W.L. = water level, figures indicate time of casting (hours) after completion of boring.
4) Location of borings shown thus —●
5.) Location of borings with strainer holes shown thus -◉
6.) All elev. & depths are referred to Transit Authority datum elev. 100.00 which is 2.583 ft. above M.S.L. of Sandy Hook.

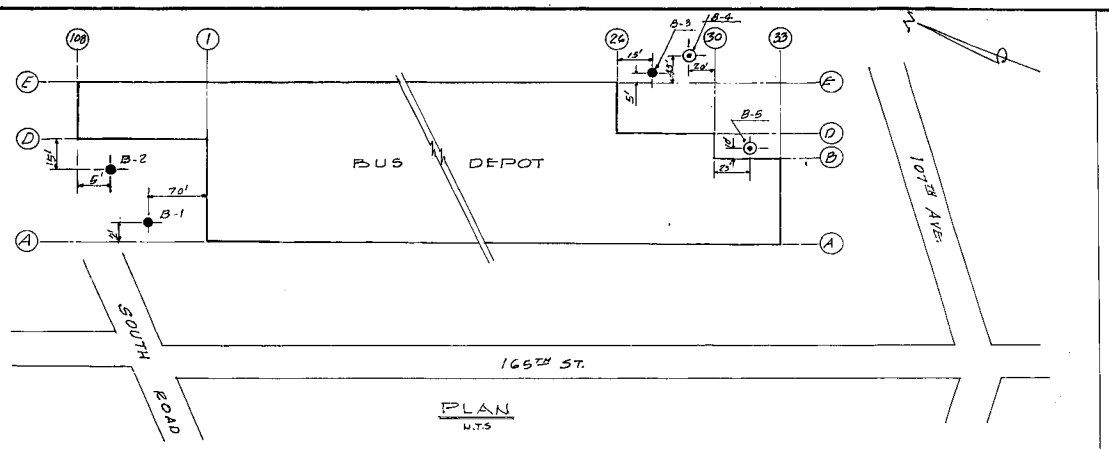
RAYMOND INTERNATIONAL INC.
140 CEDAR STREET NEW YORK, N.Y.

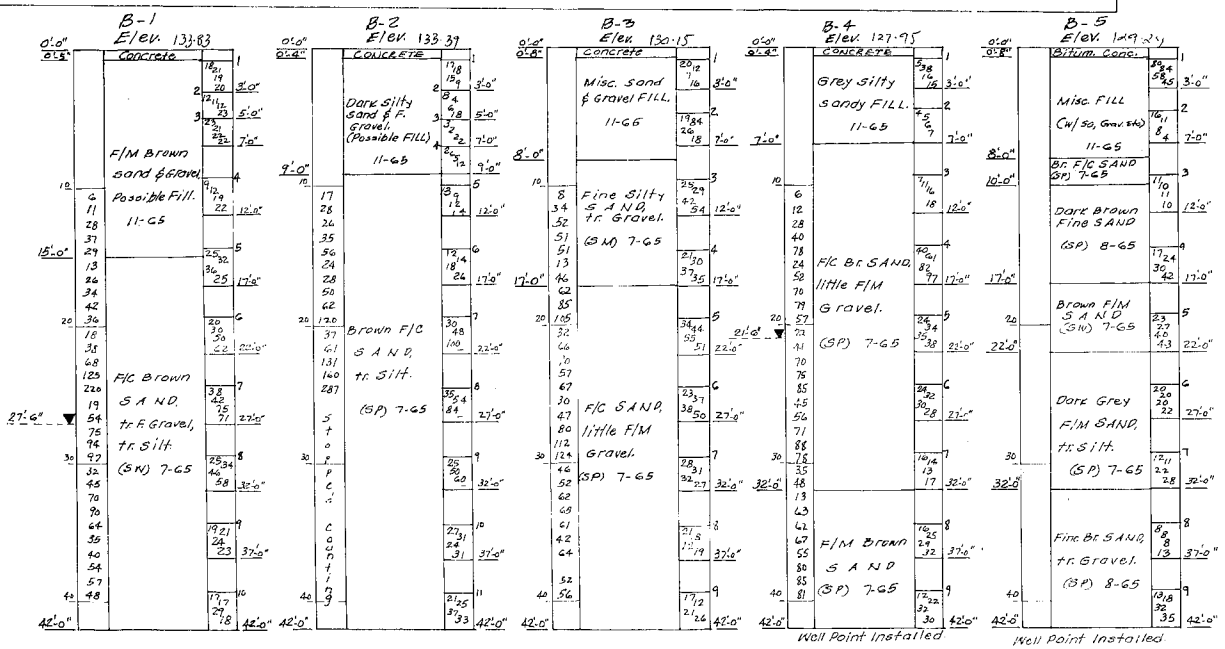
N. Y. CITY TRANSIT SYSTEM
JAMAICA BUS D
BOROUGH OF QUEENS
BORINGS & LOCATION PLAN

DATE 3-29-65

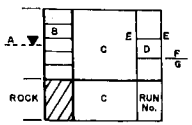
LB 4658 DWG. NO. 12406-1

File No. 8125 Drwg No. 3





LEGEND



A - WATER READING AND DATE TAKEN.

B - NUMBER OF BLOWS OF A 300 LB. HAMMER FALLING 18 INCHES REQUIRED TO DRIVE A 4" CASING (UNLESS OTHERWISE NOTED) EACH 12 INCHES.

C - STRATA DESCRIPTION.

D - NUMBER OF BLOWS OF A 140 LB. HAMMER (UNLESS OTHERWISE NOTED) FALLING 30 INCHES REQUIRED TO DRIVE A 2 INCH SPLIT SPOON 6 INCHES.

E - SAMPLE NUMBER.

F - DEPTH AT END OF SAMPLE DRIVE.

G - SAMPLE RECOVERY.

GENERAL NOTES

1. - ALL ELEVATIONS (UNLESS OTHERWISE NOTED) SHALL BE REFERRED TO THE TRANSIT AUTHORITY DATUM WHERE ELEV. 100.00 IS 2.653' ABOVE MEAN SEA LEVEL AT SANDY HOOK, N.J., U.S.C. & G. SURVEY DATUM.

2. - LOCATION OF BORING SHOWN THUS. ●

3. - LOCATION OF BORING WITH WELL POINT INSTALLED SHOWN THUS ⊕

4. - M/F, C/F ETC. DENOTES "MEDIUM TO FINE", "COARSE TO---".

5. - RB DENOTES ROLLER BIT.

6. - O.E.S. DENOTES OPEN END SAMPLE.

7. - 4" CASING USED (OR OTHERWISE NOTED).

8. - _____ CORE BIT USED (OR OTHERWISE NOTED).

9. - R.Q.D. DENOTES "ROCK QUALITY DESIGNATION" WHICH IS THE TOTAL LENGTH OF PIECES OVER FOUR INCHES IN A GIVEN RUN DIVIDED BY THE LENGTH OF THE GIVEN RUN.

10. - 11-GS, 7-GS ETC. REFER TO CLASS OF MATERIAL DESCRIBED IN C26-1103.4, TABLE 11-2 OF THE BUILDING CODE OF THE CITY OF NEW YORK.

11. - (SP), (ML), ETC. REFER TO THE UNIFIED SOIL CLASSIFICATION SYSTEM DESCRIBED IN C26-1103.1, TABLE 11-1 OF THE BUILDING CODE OF THE CITY OF NEW YORK.

12. - W.O.R. DENOTES WEIGHT OF ROD(S). " "

13. UD DENOTES UNDISTURBED SAMPLE, 30" LONG, 3" O BRASS TUBE.

14. ● DENOTES 300# HAMMER " "

" "

Warren George, Inc.

WARREN GEORGE, INC.
JERSEY CITY, N.J.
C-31516

DWG NO 583

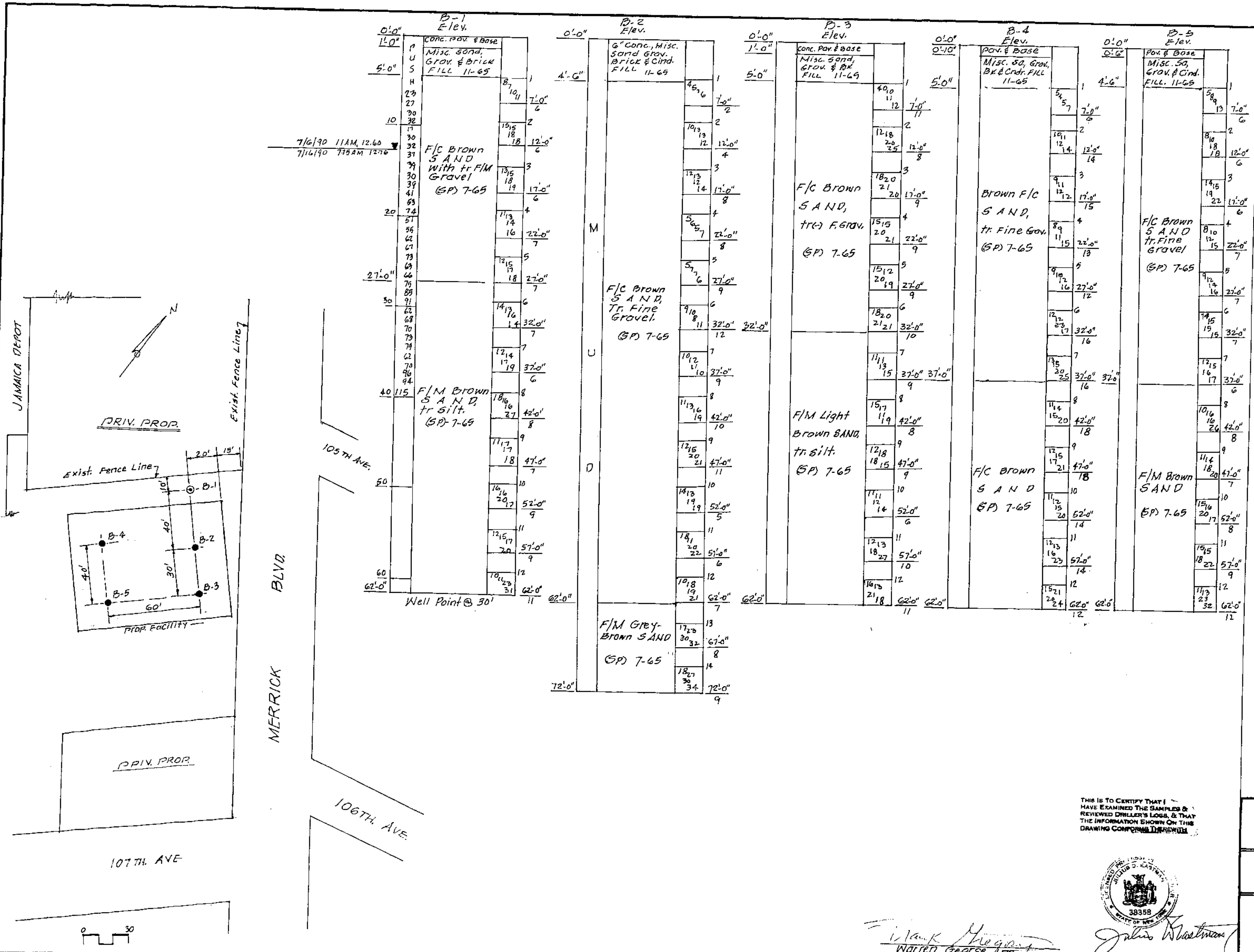
BORING PLAN & SECTIONS

NEW YORK CITY TRANSIT SYSTEM
(32942)
JAMAICA BUS DEPOT
BOROUGH OF Queens

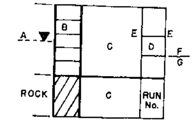
DRWN BY: HH | SCALE As Noted | DATE March 1966
CHECKED BY: JG

SHEET 1 OF 1 SHEET(S)
BUS DEPOT REHAB

1



LEGEND



A - WATER READING AND DATE TAKEN.

B - NUMBER OF BLOWS OF A 300 LB. HAMMER FALLING 18 INCHES REQUIRED TO DRIVE A 4" CASING (UNLESS OTHERWISE NOTED) EACH 12 INCHES.

C - STRATA DESCRIPTION.

D - NUMBER OF BLOWS OF A 140 LB. HAMMER (UNLESS OTHERWISE NOTED) FALLING 30 INCHES REQUIRED TO DRIVE A 2 INCH SPLIT SPOON 6 INCHES.

E - SAMPLE NUMBER.

F - DEPTH AT END OF SAMPLE DRIVE.

G - SAMPLE RECOVERY IN INCHES

GENERAL NOTES

1. - ALL ELEVATIONS (UNLESS OTHERWISE NOTED) SHALL BE REFERRED TO THE TRANSIT AUTHORITY DATUM WHERE ELEV. 100.00 IS 2.653' ABOVE MEAN SEA LEVEL AT SANDY HOOK, N.J., U.S.C. & G. SURVEY DATUM.
2. - LOCATION OF BORING SHOWN THUS.
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5. - RB DENOTES ROLLER BIT.
6. - O.E.S. DENOTES OPEN END SAMPLE.
7. - 4" CASING USED (OR OTHERWISE NOTED).
8. - ______ CORE BIT USED (OR OTHERWISE NOTED).
9. - R.Q.D. DENOTES "ROCK QUALITY DESIGNATION" WHICH IS THE TOTAL LENGTH OF PIECES OVER FOUR INCHES IN A GIVEN RUN DIVIDED BY THE LENGTH OF THE GIVEN RUN.
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12. - W.O.R. DENOTES WEIGHT OF ROD(S).
13. UD DENOTES UNDISTURBED SAMPLE, 30" LONG, 3"Ø BRASS TUBE.
14. * DENOTES 300# HAMMER

THIS IS TO CERTIFY THAT I HAVE EXAMINED THE SAMPLES & REVIEWED DRILLER'S LOGS, & THAT THE INFORMATION SHOWN ON THIS DRAWING CONFORMS THEREWITH

Warren George, Inc.

38358

WARREN GEORGE, INC.
JERSEY CITY, N.J.
C-31320

BORING PLAN & SECTIONS

NEW YORK CITY TRANSIT SYSTEM
UNDERGROUND TANK REPLACEMENT
AT JAMAICA BUS DEPOT
BOROUGH OF Queens contract # C-32987

DRWN BY: J.S. | CHECKED BY: J.E. | SCALE As Noted | DATE July 1990

12-90

DWG # 1240 TANK REPLACEMENT JAMAICA AVE DEPOT

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Appendix E: Natural Resources

- Letter to NYSDEC 2016
- Letter to NYSDEC 2019
- USFWS Reconstruction and Expansion of Jamaica Bus
- Depot IPaC Trust Resources Report
- Letter to USFWS 2019
- Certified Mail Receipts

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Letter to NYSDEC 2016

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October 11, 2016

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor
Albany, NY 12233-4757

Attention: Nicholas Conrad, Information Resources Coordinator

Reference: Reconstruction and Expansion of Jamaica Bus Depot in Queens

Subject: **Rare, Endangered and Threatened Species Information in the Vicinity of the Jamaica Bus Depot at 165-18 South Road (Block 10164, Lots 46, 80, 84, 97, and 103), Queens, New York**

STV Project No.: 4017555

Dear Mr. Conrad:

The Metropolitan Transportation Authority (MTA) New York City Transit (NYCT) has contracted STV Incorporated to prepare a New York State Environmental Quality Review Act (SEQRA) Environmental Impact Statement (EIS) for the proposed reconstruction and expansion of the Jamaica Bus Depot facility at 165-18 South Road in the Jamaica section of Queens (Queens County). The project site is located on Block 10164, which is bounded by a South Road to the north, 107th Avenue to the south, Merrick Boulevard to the east, and 165th Street to the west. (Please refer to map included with this letter.)

In order to support our EIS efforts, we are writing to request information regarding occurrences of rare, threatened and endangered species in the project area; specifically, we are requesting information from the New York Natural Heritage Program to establish the presence of such species in the project area and within one-half mile of the project site.

Thank you for your assistance in this matter.

Sincerely,

STV Incorporated
Samantha Motley

Samantha Motley
Planner

225 PARK AVENUE SOUTH
NEW YORK, NEW YORK 10003-1604
(212) 777-4400 FAX: (212) 529-5237

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Letter to NYSDEC 2019

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April 24, 2019

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor
Albany, NY 12233-4757

Attention: Nicholas Conrad, Information Resources Coordinator

Reference: Reconstruction and Expansion of Jamaica Bus Depot in Queens

Subject: **Rare, Endangered and Threatened Species Information in the Vicinity of the Jamaica Bus Depot at 165-18 Tuskegee Airmen Way (Block 10164, Lots 46, 80, 84, 97, and 103), Queens, New York**

STV Project No.: 4016502

Dear Mr. Conrad:

The Metropolitan Transportation Authority (MTA) New York City Transit (NYCT) has contracted STV Incorporated to prepare a New York State Environmental Quality Review Act (SEQRA) Environmental Impact Statement (EIS) for the proposed reconstruction and expansion of the Jamaica Bus Depot facility at 165-18 Tuskegee Airmen Way in the Jamaica section of Queens (Queens County). The project site is located on Block 10164, which is bounded by Tuskegee Airmen Way to the north, 107th Avenue to the south, Merrick Boulevard to the east, and 165th Street to the west. (Please refer to the project location map included with this letter.)

As shown on the attached map, based on a review of NYSDEC Natural Heritage Program's Environmental Resource Mapper in April 2019, there are no records of rare or state-listed animals or plants, or significant natural communities on or within the immediate vicinity of the project site.

In order to support our EIS efforts, we are writing to request information regarding occurrences of rare, threatened and endangered species in the project area; specifically, we are requesting information from the New York Natural Heritage Program to establish the presence of such species in the project area and within one-half mile of the project site. As noted, the Environmental Resource Mapper map did not show any conflicts with protected resources.

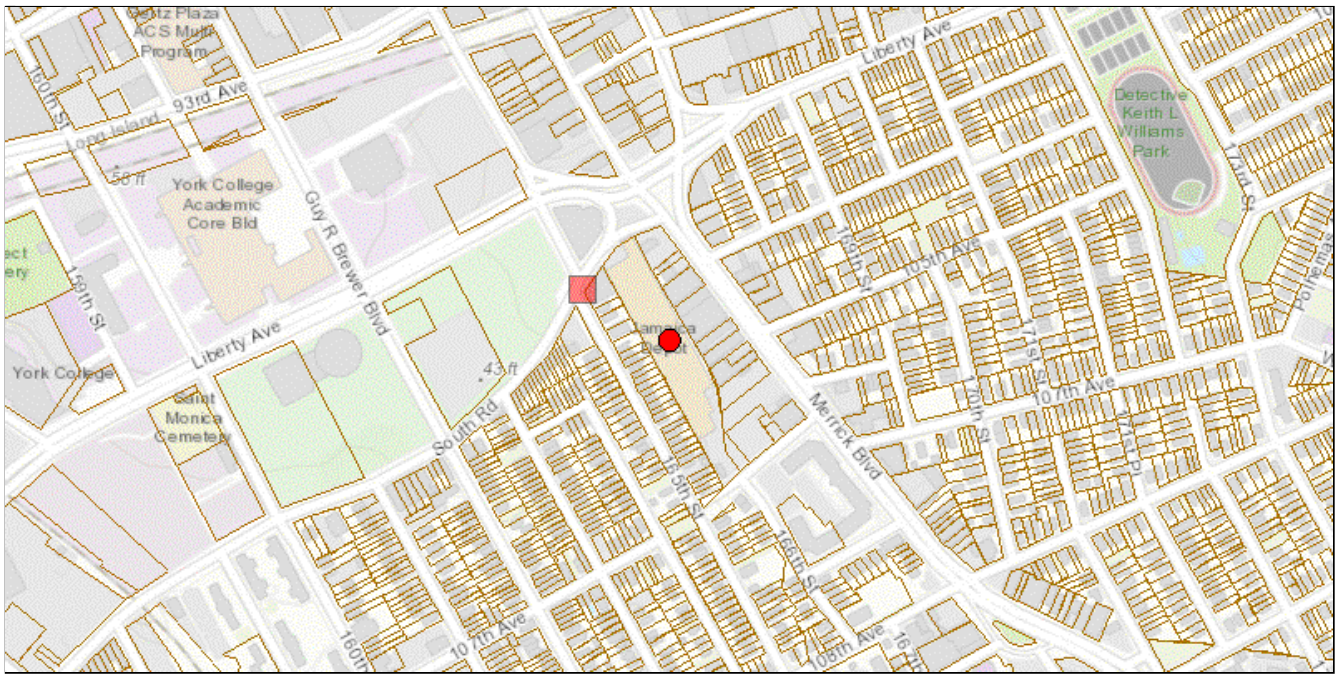
Thank you for your assistance in this matter.

Sincerely,

Carly Gazze

Carly Gazze
STV Incorporated
Environmental Scientist

Environmental Resource Mapper



The coordinates of the point you clicked on are:

UTM 18	**Easting:**	602163.779	**Northing:**	4506246.098
Longitude/Latitude	**Longitude:**	-73.791	**Latitude:**	40.701

The approximate address of the point you clicked on is:
165-18 South Rd, Jamaica, New York, 11433

County: Queens
City: New York
USGS Quad: JAMAICA

DEC Region

Region 2:
(New York City) Brooklyn (Kings County), Bronx (Bronx County), Manhattan (New York County), Queens (Queens County) and Staten Island (Richmond County). For more information visit http://www.dec.ny.gov/about/605.html.

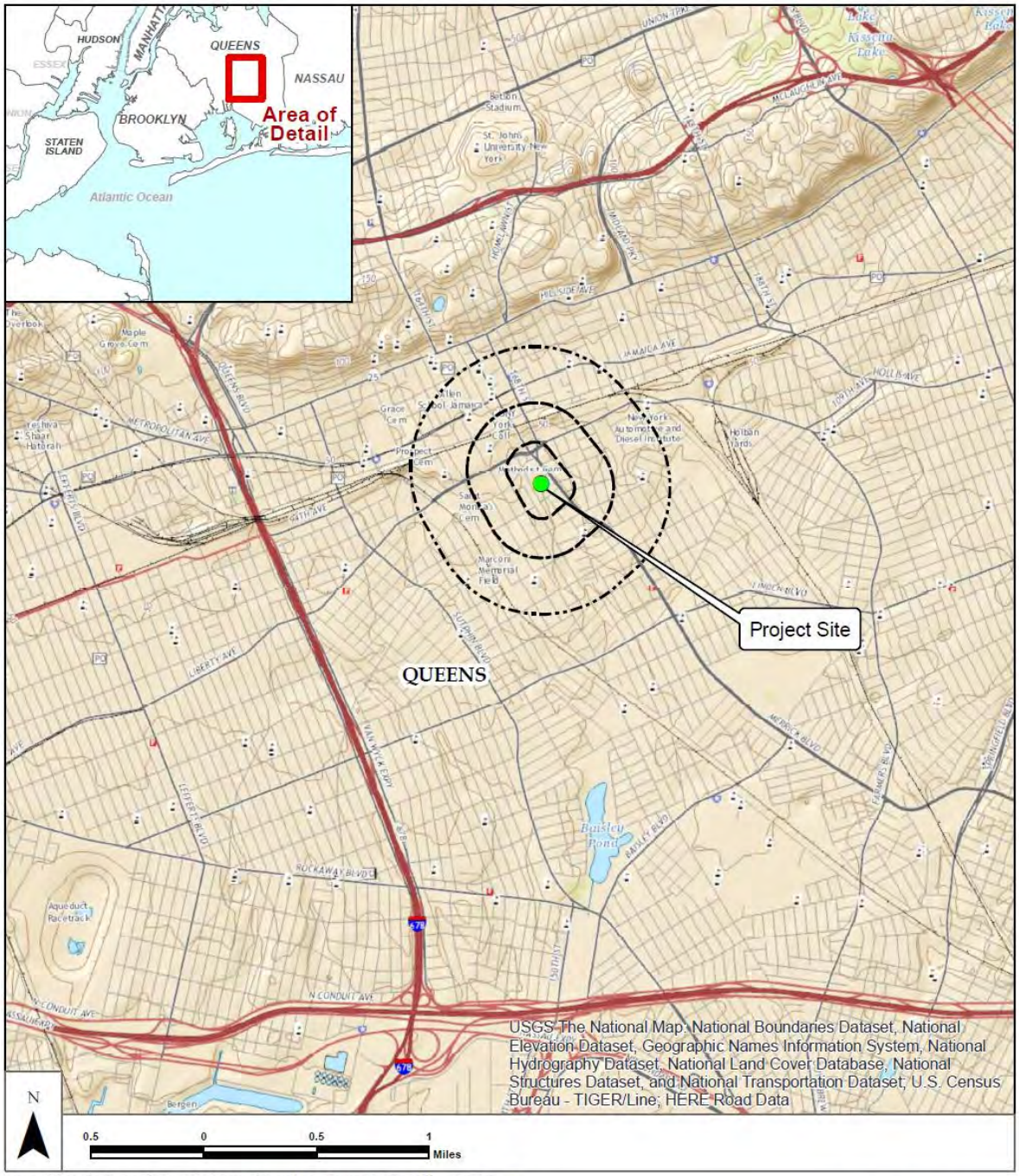
If your project or action is within or near an area with a rare animal, a permit may be required if the species is listed as endangered or threatened and the department determines the action may be harmful to the species or its habitat.

If your project or action is within or near an area with rare plants and/or significant natural communities, the environmental impacts may need to be addressed.

The presence of a unique geological feature or landform near a project, unto itself, does not trigger a requirement for a NYS DEC permit. Readers are advised, however, that there is the chance that a unique feature may also show in another data layer (ie. a wetland) and thus be subject to permit jurisdiction.

Please refer to the "Need a Permit?" tab for permit information or other authorizations regarding these natural resources.

Disclaimer: If you are considering a project or action in, or near, a wetland or a stream, a NYS DEC permit may be required. The Environmental Resources Mapper does not show all natural resources which are regulated by NYS DEC, and for which permits from NYS DEC are required. For example, Regulated Tidal Wetlands, and Wild, Scenic, and Recreational Rivers, are currently not included on the maps.



Source: USGS The National Map, 2015: National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data; STV Incorporated, 2015.

Figure 1

PROJECT LOCATION AND STUDY AREA

Legend

- 400-ft Study Area
- 1/4-mile Study Area
- 1/2-mile Study Area

Reconstruction of Jamaica Bus Depot

USFWS Reconstruction and Expansion of Jamaica Bus Depot IPaC Trust Resources Report

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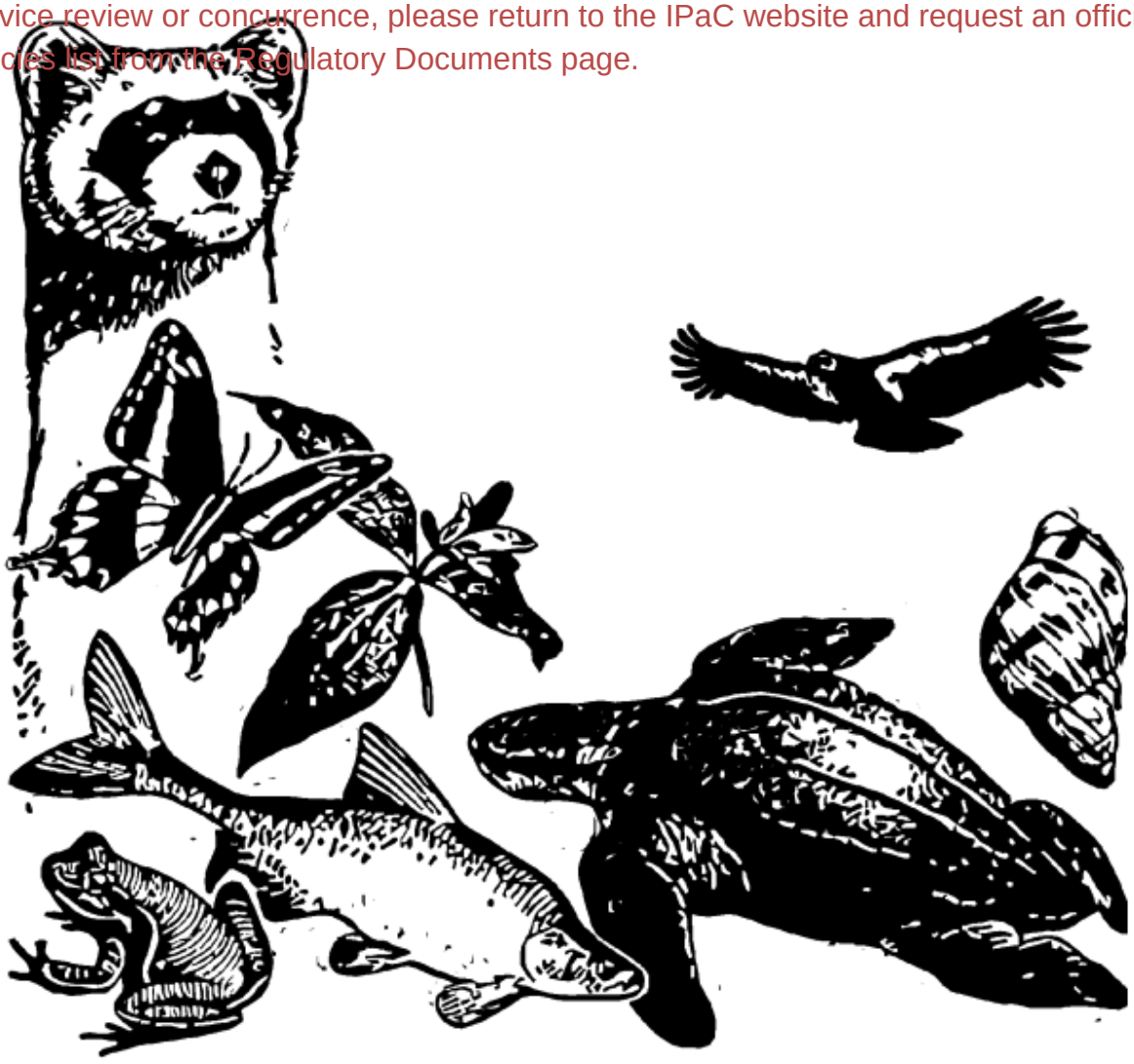
U.S. Fish & Wildlife Service

Reconstruction and Expansion of the Jamaica Bus Depot

IPaC Trust Resources Report

Generated October 12, 2016 02:13 PM MDT, IPaC v3.0.9

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

Table of Contents

U.S. Fish & Wildlife Service

IPaC Trust Resources Report

NAME

Reconstruction and Expansion of the Jamaica Bus Depot

LOCATION

Queens County, New York

DESCRIPTION

165-18 South Road
Jamaica, NY 11433

IPAC LINK

https://ecos.fws.gov/ipac/project/PZWSP-4W7CR-AFDPS-QMGRT-CNCSWM

U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967
(631) 286-0485

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Birds

Piping Plover Charadrius melodus — Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B079

Red Knot Calidris canutus rufa — Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DM

Roseate Tern Sterna dougallii dougallii — Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B07O

Flowering Plants

Seabeach Amaranth Amaranthus pumilus — Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=Q2MZ

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

---

1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.birdscanada.org/birdmon/default/datasummaries.jsp

The following species of migratory birds could potentially be affected by activities in this location:

American Oystercatcher Haematopus palliatus — Bird of conservation concern
On Land Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0G8

American Bittern Botaurus lentiginosus — Bird of conservation concern
On Land Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F3

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
On Land Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Black Skimmer Rynchops niger — Bird of conservation concern
On Land Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EO

Black-billed Cuckoo Coccyzus erythropthalmus — Bird of conservation concern
On Land Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HI

Blue-winged Warbler Vermivora pinus — Bird of conservation concern
On Land Season: Breeding

Canada Warbler Wilsonia canadensis — Bird of conservation concern
On Land Season: Breeding

Cerulean Warbler Dendroica cerulea — Bird of conservation concern
On Land Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B09I

Fox Sparrow Passerella iliaca — Bird of conservation concern
On Land Season: Wintering

Gull-billed Tern Gelochelidon nilotica — Bird of conservation concern
On Land Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JV

Hudsonian Godwit Limosa haemastica — Bird of conservation concern
At Sea Season: Migrating

Least Bittern Ixobrychus exilis
On Land Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B092

Least Tern Sterna antillarum — Bird of conservation concern
On Land Season: Breeding

Loggerhead Shrike Lanius ludovicianus — Bird of conservation concern
On Land Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY

Peregrine Falcon Falco peregrinus — Bird of conservation concern
On Land Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Pied-billed Grebe Podilymbus podiceps — Bird of conservation concern
On Land Season: Year-round

Prairie Warbler Dendroica discolor — Bird of conservation concern
On Land Season: Breeding

Purple Sandpiper Calidris maritima — Bird of conservation concern
On Land Season: Wintering

Red Knot Calidris canutus rufa — Bird of conservation concern
On Land Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DM

Rusty Blackbird Euphagus carolinus — Bird of conservation concern
On Land Season: Wintering

Saltmarsh Sparrow Ammodramus caudacutus — Bird of conservation concern
On Land Season: Breeding

Seaside Sparrow Ammodramus maritimus — Bird of conservation concern
On Land Season: Year-round

Short-eared Owl Asio flammeus — Bird of conservation concern
On Land Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Snowy Egret Egretta thula — Bird of conservation concern
On Land Season: Breeding

Upland Sandpiper Bartramia longicauda — Bird of conservation concern
On Land Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HC

Willow Flycatcher Empidonax traillii — Bird of conservation concern
On Land Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F6

Wood Thrush Hylocichla mustelina — Bird of conservation concern
On Land Season: Breeding

Worm Eating Warbler Helmitheros vermivorum — Bird of conservation concern
On Land Season: Breeding

Wildlife refuges and fish hatcheries

There are no refuges or fish hatcheries in this location

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

There are no wetlands in this location

Letter to USFWS 2019

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April 24, 2019

U.S. Fish and Wildlife Service
Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258

RE: Rare, Endangered and Threatened Species Information in the Vicinity of the Jamaica Bus Depot at 165-18 Tuskegee Airmen Way (Block 10164, Lots 46, 80, 84, 97, and 103), Queens, New York

Subject: Request for Clearance: Piping Plover, Red Knot, Roseate Tern and Seabeach Amaranth

To Whom It May Concern,

The Metropolitan Transportation Authority (MTA) New York City Transit (NYCT) has contracted STV Incorporated to prepare a New York State Environmental Quality Review Act (SEQRA) Environmental Impact Statement (EIS) for the proposed reconstruction and expansion of the Jamaica Bus Depot facility at 165-18 Tuskegee Airmen Way (formerly South Road) in the Jamaica section of Queens (Queens County). The project site is located on Block 10164, which is bounded by Tuskegee Airmen Way to the north, 107th Avenue to the south, Merrick Boulevard to the east, and 165th Street to the west. The site is in an urban area comprised of commercial and residential land uses and is located in a heavily travelled transportation corridor. (Please refer to map included with this letter).

According to USFWS's IPaC Trust Resource attached response letter (March 4, 2019) the piping plover, red knot, roseate tern and seabeach amaranth have been known to be present within the vicinity of the project site; however, there is no critical habitat within the project area for any of the named species (see attached).

IDENTIFIED SPECIES AND HABITATS

PIPING PLOVER (CHARADRIUS MELODUS)
The piping plover is listed as an endangered species in New York State (Federally threatened). These small shorebirds, approximately 5.5-inches in length, have a sand-colored upper body, a white underside, and orange legs. Piping plovers use wide, flat, open, sandy beaches with very little grass or other vegetation. Piping plovers are migratory birds and breed during the spring and summer in northern United States and Canada. Piping plovers nest in North America along the shorelines of the Great Lakes, the shores of rivers and lakes in the Northern Great Plains, and along the Atlantic Coast.

RED KNOT (CALIDRIS CANUTUS RUFA)
The red knot is listed as federally threatened. These small shorebirds, approximately 9-11-inches in length, have varying body colors related to the season. The red knot are migratory birds and breed in Canadian Arctic and winters in parts of the United States, the Caribbean and South America. Red knot uses well-known stopover areas on the Atlantic Coast.

ROSEATE TERN (STERNA DOUGALLII DOUGALLII)
The roseate tern is listed as an endangered species in New York State. The roseate tern is approximately 14- to 17-inches in length, with light-gray wings and back. According to the NYSDEC Fact Sheet, the

225 PARK AVENUE SOUTH
NEW YORK, NEW YORK 10003-1604
(212) 777-4400 FAX: (212) 529-5237

roseate tern is a marine coastal species. Populations of the roseate tern are known from the Atlantic Coast to North Carolina within the United States, Canada and Bermuda.

SEABEACH AMARANTH (AMARANTHUS PUMILUS)
Seabeach amaranth is a federally threatened plant species. It is found along the Atlantic Coast and barrier islands. According the USFWS New Jersey Field Office website the plant is annual member of the amaranth family. Seabeach amaranth usually grows on a nearly pure sand substrate, occasionally with shell fragments mixed in.

POTENTIAL EFFECTS

The site is located in an urban area comprised of commercial and residential land uses, located in a heavily travelled transportation corridor in Queens. The project site is separated from Jamaica Bay, which feeds into the Hudson River, and its shorelines by dense residential and commercial tracks. Baisley Pond is the closest waterbody to the project area, and it is located over 1-mile south of the project limits.

The Jamaica Bus Depot runs parallel to Merrick Boulevard and 165th Street. Vegetation in the project area includes tree-lined roads located on adjacent and surrounding streets. Additionally, the York College of Health Physical Education Complex and an associated parking lot are located on the northwestern side of the project area, which contain well-maintained grass fields and trees.

The piping plover, red knot and roseate tern are shorebirds that nest and feed along coastal sand and gravel beaches. Seabeach amaranth also thrives along sandy beaches. Neither the project site nor any location within a 1-mile radius of the site contain suitable shoreline habitat for the birds or the plant species, and therefore, the project would not threaten the piping plover, red knot and roseate tern, seabeach amaranth or their habitat.

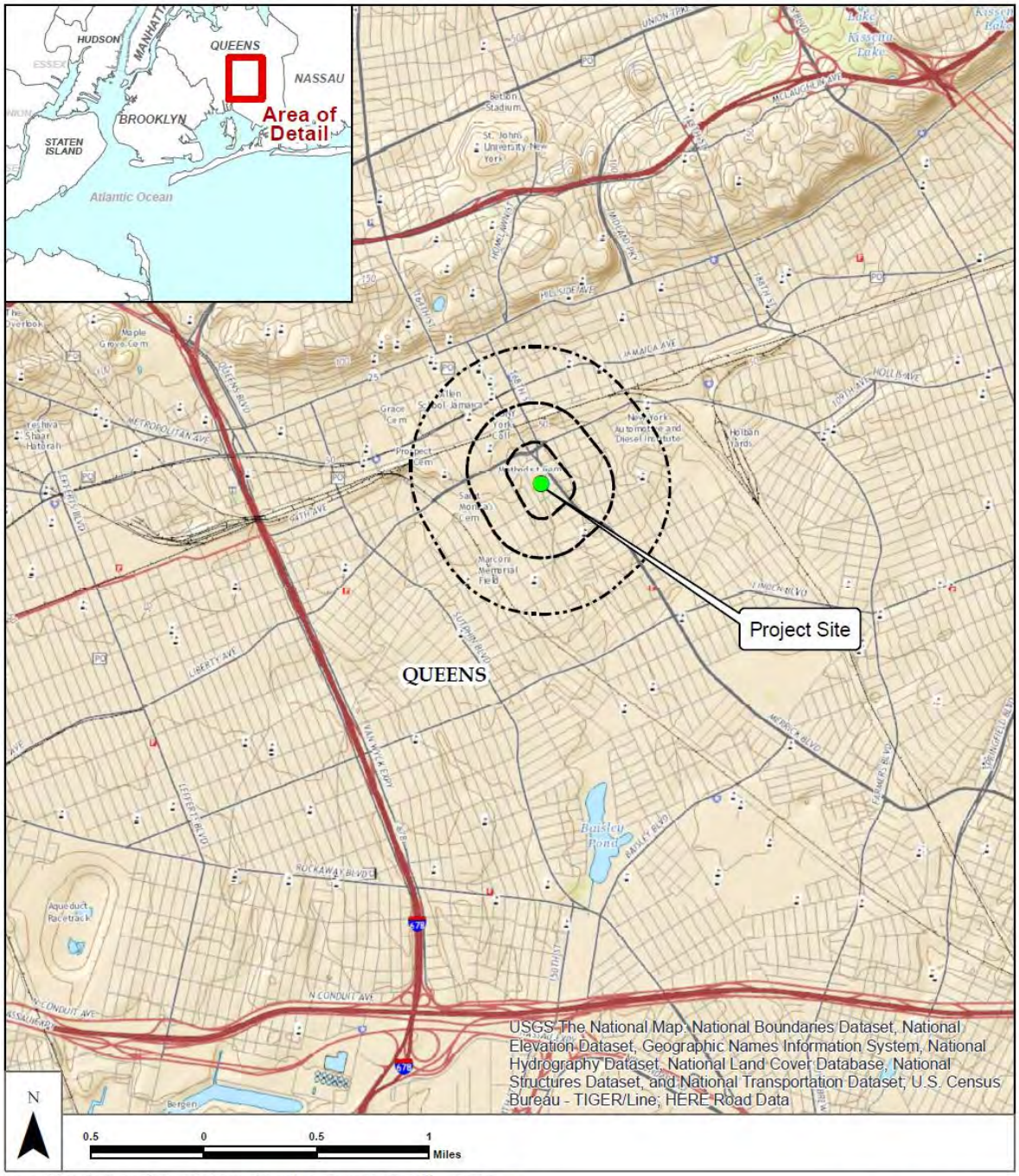
Please let us know if there are any additional species that may be located within the project area. If not, we request clearance of the above identified species for the project area and that no further coordination will be required.

Sincerely,

Carly Gazze

Carly Gazze
225 Park Avenue South
Environmental – 4th Floor
New York, New York 10003

Encl.: Attachment



Source: USGS The National Map, 2015: National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data; STV Incorporated, 2015.

Figure 1

PROJECT LOCATION AND STUDY AREA

Legend

- 400-ft Study Area
- 1/4-mile Study Area
- 1/2-mile Study Area

Reconstruction of Jamaica Bus Depot

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258
Phone: (631) 286-0485 Fax: (631) 286-4003

In Reply Refer To: March 04, 2019
Consultation Code: 05E1LI00-2019-SLI-0316
Event Code: 05E1LI00-2019-E-00715
Project Name: Proposed Reconstruction and Expansion of jamaica Bus Depot

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258
(631) 286-0485

Project Summary

Consultation Code: 05E1LI00-2019-SLI-0316

Event Code: 05E1LI00-2019-E-00715

Project Name: Proposed Reconstruction and Expansion of jamaica Bus Depot

Project Type: TRANSPORTATION

Project Description: The Proposed Metropolitan Transportation Authority (MTA) New York City Transit Project involves the reconstruction and expansion of the Jamaica Bus Depot (JBD), located at 165-18 Tuskegee Airmen Way in Jamaica, Borough of Queens, New York. The purpose of the Proposed Project is to: provide the necessary operation, maintenance and on-site storage of up to 300 Standard Bus Equivalents (SBEs), in order to serve the projected bus assignments at this depot; allow additional capacity due to the density of bus service in this section of the city and the long-range outlook for new service demands; and, accommodate potential route/ depot assignment reconfigurations. The need for the Proposed Project results from the antiquated operations and maintenance technology and limited storage space at the existing JBD.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/40.70063394765823N73.7902466937156W

Counties: Queens, NY

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern *Sterna dougallii dougallii* Population: northeast U.S. nesting pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

Flowering Plants

NAME	STATUS
Seabeach Amaranth *Amaranthus pumilus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8549	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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MADISON SQUARE STATION
04/24/2019

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Appendix F: Contaminated and Hazardous Materials

- Phase I ESA 104-28 Merrick Boulevard
- Phase I ESA 104-32 Merrick Boulevard
- Phase I ESA 105-02 Merrick Boulevard
- Phase I ESA 105-22 Merrick Boulevard
- Phase I ESA 106-04 Merrick Boulevard
- Phase I ESA 166-15 107th Avenue
- Phase I ESA - Jamaica Bus Depot

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Phase I ESA - 104-28 Merrick Boulevard

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PHASE I ENVIRONMENTAL SITE ASSESSMENT
OF

104-28 MERRICK BOULEVARD
BLOCK 10164, LOT 74
JAMAICA, QUEENS, NEW YORK 11433

CONTRACT NO.: CCM-1411/D-61162
TASK ORDER NO.: 24
CONSULTANT PROJECT NO.: 30-17749-0001

AUGUST 24, 2016

Prepared by:

STV Incorporated
225 Park Avenue South
New York, NY 10003
Phone: (212) 777-4400

Prepared for:

New York City Transit
2 Broadway
New York, NY 10004
Phone: 646-252-3608

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

At the request of New York City Transit (NYCT), STV Incorporated (STV) conducted a Phase I Environmental Site Assessment (ESA) of the property located at 104-28 Merrick Boulevard, Jamaica, Queens, New York 11433 (hereafter referred to as the "Site"). The legal description of the Site is Block 10164, Lot 74. NYCT is evaluating the feasibility of acquiring the Site for the Jamaica Bus Depot reconstruction.

Block 10164, Lot 74 is an approximately 8,230 square-foot (sf) property that contains a one-story building with a partial basement constructed in 1931. The building was previously occupied by 'RVM Wheels', a custom wheel, tire, and rim supply and repair shop. The Site is owned by "NAV Enterprises, Inc." according to the Environmental Data Resources (EDR) Environmental Lien Search. Historically, the Site was occupied by a store, an auto repair shop, and a storage garage. The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

The main objective of the Phase I ESA is to identify *recognized environmental conditions (RECs)* and environmental concerns that may affect the suitability of the Site for acquisition and redevelopment. RECs are defined in ASTM International (ASTM) Standard Practice E 1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property. Note that *controlled recognized environmental conditions (CRECs)* are considered to be RECs and are listed in the Executive Summary and Conclusions of this Phase I ESA. Additionally, *vapor encroachment conditions (VECs)* were evaluated as per ASTM E 2600-10.

Other environmental issues and conditions that, in the opinion of the *environmental professional* conducting the assessment, would not be considered *RECs* are identified in this assessment. These may include *historical RECs* and/or *de minimis* conditions. The Phase I ESA also includes a preliminary evaluation of specific potential environmental issues or conditions that are, according to ASTM E 1527-13, considered non-scope considerations. These issues include radon, asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing light ballasts and caulking materials, exterior lead-based paint (LBP), chemical storage, wetlands, regulatory compliance issues, dry cleaner and other industrial emissions, mold, biological agents, electromagnetic fields, and methane. The Phase I ESA included a review of Federal, State, and local records, previous reports and historical documents; visual observation of the Site and adjoining properties; and, interviews with selected Site representatives.

The assessment requested by NYCT is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included evaluation of the following: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-site solid waste management and disposal practices; on-site hazardous materials and petroleum products management; chemical storage, ACM, PCBs and exterior LBP management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions; radon; mold and moisture intrusion; biological agents; electromagnetic fields; and, potential for methane generating materials.

Summary of RECs, CRECs, VECs and Environmental Concerns

This Phase I ESA has revealed the following RECs, CRECS, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The historic use of the Site as an auto repair facility and auto parts manufacturing facility is considered a REC/VEC.

- The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that generates spent halogenated solvents is located in close proximity to the Site and is considered a REC/VEC.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- A facility with an open spill is located northwest of the Site at 165-18 South Road. This property is considered a REC/VEC based on its proximity to the Site and hydraulically cross-gradient position with respect to the Site.

- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Suspect ACM consisting of acoustic ceiling tiles, tile grout, tile mortar, pipe insulation, caulking, vinyl floor tiles, mastic, and gypsum board and joint compound exists throughout the Site.
- Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.
- Fluorescent lighting fixtures and window caulking identified throughout the building may contain PCBs.

STV recommends that any ACM, LBP, and/or PCB-containing materials affected by future renovations, repairs or demolition at the Site be identified and properly managed during such activities. If the NYCT considers purchasing the property in the future, or if future development requires soil disturbance, a comprehensive Phase II Environmental Site Investigation should be conducted.

2.0 INTRODUCTION

This report summarizes the results of the Phase I Environmental Site Assessment (ESA) of the property located at 104-28 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 74) (hereafter referred to as the "Site"). Block 10164, Lot 74 is an approximately 8,230 square-foot (sf) property that contains a one-story building with a partial basement constructed in 1931. The building was previously occupied by 'RVM Wheels', a custom wheel, tire, and rim supply and repair shop. NYCT is evaluating the feasibility of acquiring the Site for the Jamaica Bus Depot reconstruction.

The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

Mr. Doane Cafferty of STV performed the Site visit on November 12, 2015, and was accompanied by Mr. Ron Bello, the property owner. The weather was approximately 50º F with sunny skies; there were no limitations caused by the weather.

2.1 Selected Definitions

The following terms are used throughout this report and, for the purpose of clarity, corresponding definitions are provided. These terms are fully defined in ASTM E 1527-13 and ASTM E 2600-10.

Controlled Recognized Environmental Condition (CREC) – A recognized environmental condition resulting from a past *release* of *hazardous substances* or *petroleum products* that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority) with *hazardous substances* or *petroleum products* allowed to remain in place subject to the implementation of required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Historical Recognized Environmental Condition (HREC) – A past *release* of any *hazardous substances* or *petroleum products* that occurred in connection with the *property* and has been addressed to the satisfaction of the applicable regulatory authority, without subjecting the *property* to any required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Recognized Environmental Condition (REC) – The presence or likely presence of any *hazardous substances* or *petroleum products* in, on, or at a *property:* (1) due to any *release* to the *environment*; (2) under conditions indicative of a *release* to the *environment*; or, (3) under conditions that pose a *material threat* of a future *release* to the *environment*.

Environmental Professional - A person meeting the education, training, and experience requirements as set forth in 40 CFR § 312.10(b), necessary to conduct a *site reconnaissanc*e, *interview*s, and other activities in accordance with this practice, and from the information generated by such activities, having the ability to develop opinions and conclusions regarding conditions indicative of releases or threatened releases on, at, in, or to a property, sufficient to meet the objectives and performance factors in 40 CFR § 312.20(e) and (f).

Vapor Encroachment Condition (VEC) - The presence or likely presence of chemical of concern vapors in the subsurface of the target property caused by the release of vapors from contaminated soil or groundwater or both either on or near the target property.

2.2 Purpose and Scope

The purpose of this assessment is to identify RECs, CRECs, VECs, and certain other environmental issues or concerns as they existed at the Site at the time of the Site visit. The assessment is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser, or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included, but was not limited to an assessment of the following potential environmental issues: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-Site solid waste management and disposal practices; on-Site hazardous materials and petroleum products management; asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing equipment and lead-based paint (LBP) management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions, radon, mold and moisture intrusion; biological agents; electromagnetic fields; and the potential for methane generating materials.

This evaluation was conducted by qualified *environmental professionals* utilizing a standard of good commercial and customary practice in accordance with ASTM E 1527-13. The scope of work completed for this evaluation meets all requirements of ASTM E 1527-13 and includes the following:

- Documenting the physical characteristics of the Site through a review of available topographic, geologic, wetland, flood plain, groundwater data and Site observations.

- Researching the Site history through a review of reasonably ascertainable standard sources such as land deeds, fire insurance maps, city directories, aerial photographs, prior reports and interviews.

- Documenting current Site conditions, via observations and interviews, regarding the presence or absence of hazardous substances/petroleum products; the generation, treatment, storage, or disposal of hazardous, regulated, or medical wastes; the presence of electrical equipment that utilizes oils which potentially contain PCBs; and, the presence of storage tanks (above and below ground), floor drains, drains that discharge to subsurface, former septic tanks and drywells.

- Determining the usage of adjoining and nearby properties to identify the likelihood for environmental conditions (if present and/or suspected) and concerns to migrate onto the Site.

- Evaluating information contained within Federal and State environmental databases and other local environmental records, within specific search distances.

2.3 Additions, Deviations, Deletions, Data Failures, and Data Gaps

The following environmental issues that are outside the scope of (additions to) ASTM E 1527-13 were evaluated:

- A review of available radon data for the Site vicinity.
- A review of available wetlands data.
- A visual assessment for water damage and mold.

- A visual assessment for suspect ACM.
- A visual assessment for suspect LBP.
- An assessment of potential methane generation on-Site or migration to the Site.
- Regulatory compliance.
- PCB light ballasts and caulking materials.
- Biological agents (mold, pigeon guano, medical wastes, etc.).
- Air emissions from drycleaners and other industrial sources.
- An assessment of the potential presence of electromagnetic fields (EMF).
- An assessment of any dust generating activities on or near the Site.

The following deviations, data gaps and deletions from ASTM E 1527-13 were necessary in conducting this assessment:

- The Site area history was not conducted in five-year intervals. However, sufficient information about the history of the Site and surrounding area could be obtained from the available historical fire insurance maps, aerial photographs, city directories, and local records and this data gap is not likely to alter the conclusions of this report.

2.4 Limitations and Exceptions

STV has prepared this Phase I ESA using reasonable efforts in each phase of its work to identify RECs associated with hazardous substances, wastes and petroleum products at the Site. The methodology of the Phase I ESA was consistent with the ASTM E 1527-13. Findings within this report are based on information collected from observations made on the day of the Site investigation and from reasonably ascertainable information obtained from governing public agencies and private sources.

This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation, or other construction purposes. STV makes no representation or warranty that the past or current operations at the Site are or have been in compliance with all applicable Federal, State and local laws, regulations and codes.

Regardless of the findings stated in this report, STV is not responsible for consequences or conditions arising from facts that were concealed, withheld, or not fully disclosed at the time the evaluation was conducted.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The regulatory database report provided is based on an evaluation of the data collected and compiled by a contracted data research company. The report focuses on the Site and neighboring properties that could impact the Site. Neighboring properties listed in governmental environmental records are identified within specific search distances. The search distance varies depending upon the particular government record being checked. The regulatory research is designed to meet the requirements of ASTM E 1527-13. The information provided in the regulatory database report is assumed to be correct and complete.

3.0 SITE DESCRIPTION

3.1 Site Location and Legal Description

The Site is located at 104-28 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 74). Block 10164, Lot 74 is an approximately 8,230 square-foot (sf) property that contains a one-story building with a partial basement constructed in 1931. The building was previously occupied by 'RVM Wheels', a custom wheel, tire, and rim supply and repair shop.

The Site is located in the Jamaica neighborhood of Queens. The Site is "E" designated according to the New York City Department of City Planning (NYCDCP) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). A map showing the location of the Site is presented in *Appendix A*. A Site Plan showing the Site's physical layout including adjacent land use is presented in *Appendix B*. Photographs of the Site and surrounding areas are included in *Appendix C*.

The Site is bound to the north by several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south by a fenced lot used for parking and a one-story commercial office building, bus depot parking lots, a mixed-use residential/commercial building, an auto collision repair shop, and subsequently 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street. No changes to the Site were observed since the most recent Sanborn Map (2006).

The surrounding area is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR.

According to information obtained through the New York City Department of City Planning (NYCDCP) website, the Site is currently located within zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

3.2 Physical Setting

3.2.1 Topography

According to the United States Geological Survey (USGS) 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, the elevation of the Site is approximately 30 feet above mean sea level (amsl). The topography of the immediate Site area was observed to be sloping to the south-southeast. A copy of the topographic map is presented in *Appendix A*.

3.2.2 Geology

The geology of Queens County can be characterized as a wedge-shaped layer of Cretaceous and Pleistocene unconsolidated sediments, thickening to the south-southeast. Several impermeable clay layers are found within this sediment package, generally creating three distinct aquifers. Consolidated crystalline bedrock is of Precambrian age. The thickness of the unconsolidated sequence ranges from zero to approximately 1,300 feet below ground surface (bgs) from north to south. The southernmost portions of Queens, including portions of the Rockaways, consist of glaciofluvial sediments derived from melt-water of

the retreating glaciers. Depth to bedrock within the vicinity of the Site is at least 600 feet bgs (as per "Ground-Water Resources of Kings and Queens Counties, Long Island, New York, by Herbert Buxton and Peter Schernoff, dated 1999).

3.2.3 Soils

According to the GeoCheck Section of the regulatory agency database report (*Appendix I*), the soil in the area of the Site is described as Urban Land. Urban Land refers to soils that have been altered by human activities thus making them unidentifiable. Typically, these soils have been mixed with other materials, such as brick and concrete (urban fill), and characteristics can only be determined by on-site investigation. Other surficial soil types in the area of the Site consist of silt loam, loamy sand, sandy loam, and fine sandy loam. Sandy loam refers to a soil that's made of sand, silt, and clay.

3.2.4 Hydrology

Generally, groundwater contour lines mimic the surface topography and groundwater flow direction is perpendicular to these contour lines flowing from higher to lower elevation. According to USGS digital elevation data provided by Environmental Data Resources, Inc. (EDR) of Milford, Connecticut (*Appendix I*) and the USGS 7.5-minute Quadrangle map, *Jamaica, NY*, 2013, groundwater in the vicinity of the Site is inferred to flow to the south-southwest towards Jamaica Bay. According to "Water Table Altitude in Kings and Queens Counties, New York in March 1997" (USGS, 1997) depth to groundwater is anticipated to range from approximately 20 to 25 feet bgs. Estimated groundwater levels and/or flow direction(s) may vary due to seasonal fluctuations in precipitation, local usage demands, geology, underground structures, or dewatering operations. The groundwater in the vicinity of the Site is not known to be used for human consumption, as most potable water in the area is derived from upstate reservoirs managed by New York City; the Site area is serviced by the City water supply.

STV did not observe any retention ponds or other surface water bodies on the Site. The nearest surface water body is a pond in Captain Tilly Park, located approximately 4,600 feet north-northwest of the Site. Another pond, Baisley Pond, is located approximately 1.43 miles south of the Site. Bergen Basin, an inlet off Jamaica Bay, is located approximately 3.0 miles south-southwest of the Site.

STV reviewed the United States Fish and Wildlife Service National Wetlands Inventory (NWI) map for the area of the Site (http://www.fws.gov/wetlands/data/index.html) to determine if the Site is located in a regulated wetlands area. Based on a review of the map, the Site is not located within a regulated wetlands area. A copy of the wetlands map is included in *Appendix D*.

The Federal Emergency Management Agency (FEMA) Region II Coastal Analysis and Mapping Preliminary Flood Maps & Data website (http://www.region2coastal.com/view-flood-maps-data/view-preliminary-flood-map-data/) was reviewed to assess whether the Site is located within a designated flood plain or flood zone. According to the revised preliminary FIRM Panel 3604970233G (effective date January 30, 2015), the Site is not located within a 100-year flood zone; therefore, this does not represent an environmental concern for the Site. A copy of the flood insurance map for the Site area is included in *Appendix E*.

Stormwater is collected from catch basins located on paved areas of the Site and the surrounding streets and is conveyed into the NYCDEP combined storm/sanitary sewer system.

3.2.5 Radon

Radon is a colorless, odorless radioactive gas that results from the natural breakdown of uranium minerals in soil, rock, and water, which subsequently enters the atmosphere. It can concentrate in buildings, entering through cracks and other penetrations of a building foundation. Some areas are more likely to have elevated concentrations of radon than others, reflecting subsurface lithologic conditions.

The New York State Department of Health (NYSDOH) maintains a database of radon test results on a local and county level. According to the NYSDOH, 527 radon tests have been conducted in basements in Queens County. The average radon level was found to be 1.20 picoCuries per liter (pCi/L). According to Federal Area Radon Information presented in the EDR report (*Appendix I*), radon concentrations were tested at 81 locations in Queens County. The average radon concentration in Queens County, New York was 0.620 pCi/L in living areas tested and 0.970 pCi/L in basements tested. In addition, Queens County is in United States Environmental Protection Agency (USEPA) Radon Zone 3, where the indoor average radon level is less than 2 pCi/L. These results are below the USEPA Action Level of 4.0 pCi/L; therefore, STV concludes that it is unlikely that elevated levels of radon gas are present at the Site.

4.0 ADJOINING AND SURROUNDING PROPERTIES

The area surrounding the Site is primarily characterized low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR. The following table summarizes the adjoining site uses:

Direction	Facility Name/Description	Street Address/Location	Current Use
North	Industrial/ Manufacturing	104-22 Merrick Blvd. 104-12 Merrick Blvd. 104-10 Merrick Blvd. 104-02 Merrick Blvd.	Vacant Manufacturing Facility Vacant Manufacturing Facility Vacant Manufacturing Facility Vacant Manufacturing Facility
East	Merrick Blvd. followed by Transportation/Utility and Parking and Retail Gasoline Sales	Merrick Blvd. 104-15 Merrick Blvd. 104-19 Merrick Blvd. 105-09 Merrick Blvd. 105-15 Merrick Blvd.	Public Street Sports Line Auto Repairs Auto repair facility (parking) Inter City Tire (truck tire center) BP Gas Station
South	Vacant lot, Commercial Office, Parking, Mixed-Use Res/Commercial, and Transportation /Utility followed by 107th Avenue	104-32 Merrick Blvd. 105-02 Merrick Blvd. 105-12 Merrick Blvd. 105-14 Merrick Blvd. 105-22 Merrick Blvd. 106-04 Merrick Blvd. 107th Avenue	Vacant Land Domino's Pizza/Appliance Repair Parking Lot Parking Lot Deli (closed) and Residences First World Auto/Calvin Auto Body Public Street
West	Transportation/Utility	165-18 South Road	Jamaica Bus Depot

Based on our inspection of the adjacent and surrounding properties, the following off-site RECs/VECs were identified:

- Several auto repair facilities are located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- One (1) active gasoline filling station is located in the area surrounding the Site. This property is considered a REC/VEC based on its proximity to the Site.

5.0 HISTORICAL USE RESEARCH

5.1 Land Title Records and Tax Records

STV researched prior ownership information for the Site at the New York City Department of Finance (DOF) website. In addition, prior ownership information was researched through EDR's Environmental Lien Search and the New York City Department of Buildings (NYCDOB) Automated City Register Information System (ACRIS) on-line website. The subject property is currently owned by "NAV Enterprises, Inc". Based on the research, this entity has owned the Site since at least 2009. No environmental liens were identified for the Site. All prior ownership information reviewed is presented in *Appendix J*. The review of current and historical ownership and tax records information revealed that the Site was used as an auto repair shop and storage garage which is considered a REC/VEC.

5.2 Historical USGS Topographic Quadrangles

STV reviewed available historical USGS Topographic Quadrangles for information regarding past uses of the Site and surrounding area. Topographic maps for the Brooklyn quadrangle were obtained for the following years: 1900 and 1924. Topographic maps for the Jamaica quadrangle were obtained for the following years: 1947, 1957, 1966, 1979, and 1994. The following table presents descriptions and interpretations from historical USGS topographic map review.

Year (Scale and Quadrangle)	Comments
1900 (1:62,500) Brooklyn	**Site:** The Site appears to be located amongst developed streets. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** Surrounding properties appear to be located amongst developed streets. The Long Island Railroad (LIRR) tracks are depicted to the north of the Site. A pond is depicted west-southwest of the Site on the south side of the LIRR tracks. The area a few blocks south of the Site appears as undeveloped land with only a few roadways present, rail lines, and a pond and wetlands area. Due to scale of the map, no further information can be obtained.
1924 (1:62,500) Brooklyn	**Site:** No significant changes are apparent to the Site property from the 1900 topographic map. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** No significant changes are apparent to the Site property from the 1900 topographic map. Due to scale of the map, no further information can be obtained.
1947 (1:25,000) Jamaica	**Site:** The Site is shown with one structure fronting Merrick Boulevard. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** The areas north, east, south, and west of the Site have been significantly developed with streets and structures. A long building is depicted directly northwest of the Site on the same block. Prospect Cemetery is identified west of the Site on the south side of the LIRR tracks where a pond was previously depicted. The Jamaica Station is located west-northwest of the Site. Water Supply Company Tank No. 2 is located east of the Site. Baisleys Pond is depicted several blocks south of the Site. The Contagious Disease Hospital and Queens General Hospital are located northwest of the Site on the south side of Union Turnpike.

Year (Scale and Quadrangle)	Comments
1957 (1:24,000) Jamaica	**Site:** Elevation contour lines are depicted on the map and show the Site is approximately 30 feet amsl. No structure is depicted on the Site. No other significant changes are apparent to the Site property from the 1947 topographic map. **Surrounding Properties:** An Armory is identified several blocks north of the Site on the north side of the LIRR tracks. Water pumping stations are located east and south of the Site. A water tower is depicted west of Site in the immediate vicinity of Prospect Cemetery. The LIRR Hillside Support Facility is depicted to the east of the Site. St. Albans Naval Hospital is located southeast of the Site. No other significant changes are apparent to the surrounding properties from the 1947 topographic map.
1966 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1957 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1957 topographic map.
1979 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1966 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1966 topographic map except the water tower that was west of Site near Prospect Cemetery is no longer depicted.
1994 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1979 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1979 topographic map.

Based on STV's review of historical topographic maps, the Site appears to be amongst developed streets as early as 1900. No evidence of filling was noted on the Site property. The Site property was previously developed with at least one structure. Potential buried structures from former buildings on the Site property could contain a UST and/or historic fill materials of unknown origin, and is considered a REC/VEC with respect to the Site. The Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site. The review of historical USGS Topographic Quadrangles did not indicate RECs, CRECs, HRECs, or VECs at the surrounding areas. Copies of historical USGS Topographic Maps are included in *Appendix F*.

5.3 Historical Aerial Photographs

STV reviewed historical aerial photographs of the Site and surrounding areas provided by EDR in order to identify historical land use that may have involved hazardous substances and petroleum products. Aerial photographs were obtained for the following years: 1951, 1954, 1961, 1966, 1975, 1994, 2006, 2009, and 2011. The following table summarizes descriptions and interpretations from the historical aerial photograph reviews:

Year	Comments
1951 1" – 500'	**Site:** The Site appears to be developed with a large structure. Due to the scale of the photograph, no further details can be discerned. **Surrounding Properties:** The areas adjacent to the Site to the east and south appear to be developed with multiple structures. The area north of the Site appears as a vacant lot and/or a parking lot. A long building is visible directly northwest of the Site on the same block. Railroad tracks are depicted to the north. A large water tank is located south of the Site. Due to scale of the photograph, no further details can be discerned.
1954 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1951 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1951 aerial photograph.

Year	Comments
1961 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1954 aerial photograph. **Surrounding Properties:** The vacant lot and/or parking lot immediately north of the Site appears to be developed with a structure. Some of the structures south of the Site on the same block are gone and the area appears to be used as storage for truck trailers or cargo containers. Two water tanks are located south of the Site. No other significant changes are discernible to the adjacent and surrounding properties from the 1954 aerial photograph.
1966 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1961 aerial photograph. **Surrounding Properties:** More the structures south of the Site on the same block are gone and the area appears to be used as storage for truck trailers or cargo containers. No other significant changes are discernible to the adjacent and surrounding properties from the 1961 aerial photograph.
1975 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1966 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1966 aerial photograph.
1994 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1975 aerial photograph. The image is of poor quality. **Surrounding Properties:** The structures on the block south of the Site's block are gone and the area appears to be vacant. No other significant changes are discernible to the adjacent and surrounding properties from the 1975 aerial photograph. The image is of poor quality.
2006 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1994 aerial photograph. **Surrounding Properties:** A large building complex has been constructed on the block south of the Site's block. No other significant changes are discernible to the adjacent and surrounding properties from the 1994 aerial photograph.
2009 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2006 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2006 aerial photograph.
2011 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2009 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2009 aerial photograph.

The review of historical aerial photographs revealed the presence of the following RECs and VECs at the Site:

- The Site property was previously developed with a large structure. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

The review of historical aerial photographs did not indicate RECs, CRECs, HRECs, or VECs at the surrounding areas. Copies of reproducible historical aerial photographs are included in *Appendix G*.

5.4 Historical Fire Insurance Maps (Sanborn® Maps)

A search for historical fire insurance maps for the Site and adjoining properties was conducted by EDR. These maps were obtained for the following years: 1891, 1897, 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006. The following table presents descriptions and interpretations from historical fire insurance map review.

Year	Comments
1891	**Site:** The Site is not depicted on the map. **Surrounding Properties:** Properties to the northwest include residential dwellings and sheds.
1897	**Site:** The Site is not depicted on the map. **Surrounding Properties:** Properties to the northwest include residential dwellings, sheds, a hotel, a polling place, and a **blacksmith**.
1901	**Site:** The Site is depicted with a residential dwelling fronting Merrick Plank Road (Merrick Blvd.). **Surrounding Properties:** Surrounding properties include residential dwellings, sheds, a hotel, a polling place, a **blacksmith,** and a **sign painting shop**. A large tract of vacant land is located immediately west of the Site.
1912	**Site:** The Site is depicted with a residential dwelling and a shed. No other significant changes have occurred to the Site from the 1901 map. **Surrounding Properties:** Several more residential dwellings have been developed in the areas north, east, south, and west of the Site. The **sign painting shop** is no longer depicted to the north-northeast of the Site across Merrick Blvd. No other significant changes have occurred to the adjacent and surrounding properties from the 1901 map.
1926	**Site:** The Site is depicted with a residential dwelling fronting Merrick Blvd. and two buildings located towards the western property boundary. One building is labeled 'tile storage' and the other smaller building is labeled 'storage'. The shed behind the residential dwelling is no longer depicted. No other significant changes have occurred to the Site from the 1912 map. **Surrounding Properties:** Several residential dwellings have been developed on the blocks northeast and west of the Site. An **auto painting facility** is located to the north-northeast of the Site across Merrick Blvd. and a **sign painting shop** is located to the north of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1912 map.
1951	**Site:** The residential dwelling and two tile storage buildings are gone and the entire lot is developed with a building labeled '**auto repair**'. No other significant changes have occurred to the Site from the 1926 map. **Surrounding Properties:** Two **iron works**, an **auto repair facility**, a **lacquer paint shop**, and two **gasoline filling stations** are located to the north of the Site on the same block. An **auto body repair shop** and a **gasoline filling station** are located to the east of the Site across Merrick Blvd. A **gasoline filling station**, **carpet cleaner**, and **auto repair and paint shop** are located to the south of the Site. The New York City Transit System Service Station and Garage is located to the west of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1926 map.
1981	**Site:** The structure on the Site is now labeled '**auto parts mfg**'. No other significant changes have occurred to the Site from the 1951 map. **Surrounding Properties:** A building labeled '**salvage depot**' is located immediately adjacent to the Site to the north. A building labeled '**paints**' is located immediately adjacent to the Site to the south. A **print shop** and two **auto repair facilities** are located east of the Site. A **truck repair sh**op is located to the southeast of the Site. The two **gasoline filling stations** to the north of the Site and the **gasoline filling station** south of the Site are no longer depicted. The residential dwellings and other structures located at the southern end of the Site block are gone and the area is labeled 'bus parking'. No other significant changes have occurred to the adjacent and surrounding properties from the 1951 map.
1982	**Site:** No significant changes have occurred to the Site from the 1981 map. **Surrounding Properties:** The **carpet cleaner** located to the south of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1981 map.
1986	**Site:** No significant changes have occurred to the Site from the 1982 map. **Surrounding Properties**: A **junk yard** is depicted to the east of the Site along 106th Avenue. No other significant changes have occurred to the adjacent and surrounding properties from the 1982 map.

Year	Comments
1988-1993	**Site:** No significant changes have occurred to the Site from the 1986 map. **Surrounding Properties**: The **junk yard** is no longer depicted beginning in 1991. An **auto repair facility** is depicted at the southeast corner of Merrick Blvd. and 104th Avenue beginning in 1993. No other significant changes have occurred to the adjacent and surrounding properties from the 1986 map.
1995	**Site:** No significant changes have occurred to the Site from the 1993 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1993 map.
1996	**Site:** No significant changes have occurred to the Site from the 1995 map. **Surrounding Properties:** An **auto repair and wash facility** is depicted to the north of the Site on the same block. No significant changes have occurred to the adjacent and surrounding properties from the 1995 map.
1999	**Site:** No significant changes have occurred to the Site from the 1996 map. **Surrounding Properties:** The building immediately adjacent to the Site to the south is no longer labeled '**paints**'. The **gasoline filling station** located to the east of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1996 map.
2001-2006	**Site:** No significant changes have occurred to the Site from the 1999 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1999 map.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the Site:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The historic use of the Site as an auto repair facility and auto parts manufacturing is considered a REC/VEC.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the surrounding areas:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Several current auto repair facilities and one retail gasoline filling station were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

Copies of the historical fire insurance maps are provided in *Appendix H*.

5.5 City Directories

A review of historical city directories for the Site and surrounding areas was conducted by EDR. The following table presents descriptions and interpretations from the historical city directory reviews.

Year	Comments
1922	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1934	**Site:** The Site address was listed for Jamaica Tile & Marble Co. and **Romany Coal Co**. **Surrounding Properties:** Surrounding properties included residential listings.
1939	**Site:** The Site address was listed not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1945	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1950	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1962	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1967	**Site:** The Site address was listed for Seabrand Liquor Corp. **Surrounding Properties:** Surrounding properties included residential listings.
1970	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1976	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1983	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1991	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1996	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
2000	**Site:** The Site address was listed for **Powerflite Products**. **Surrounding Properties:** Surrounding properties included residential listings.
2005	**Site:** The Site address was listed for **AAA Transmissions**, **Affordable Towing & Recovery**, Jackie's Beauty Spot, and Molly's Restaurant. **Surrounding Properties:** Surrounding properties included residential listings.
2008	**Site:** The Site address was listed for **AAA Transmission Engines Rebuilders**, Jackie's Beauty Spot, and Zion King West Indian Restaurant. **Surrounding Properties:** Surrounding properties included residential listings.
2013	**Site:** The Site address was listed for **AAA Transmissions & Engines** and **RVM Wheels Inc**. **Surrounding Properties:** Surrounding properties included residential listings.

The review of the historical city directories revealed the presence of the following RECs and VECs at the Site:

- The current and historic use of the Site as an auto repair facility and auto parts manufacturing is considered a REC/VEC.

The review of historical city directories did not indicate RECs, CRECs, HRECs, or VECs at the surrounding areas. Copies of the historical city directories are provided in *Appendix J*.

5.6 Prior Reports

STV reviewed a *Phase I ESA for Eight Properties Near Jamaica Bus Depot*, dated February 17, 2012. The report was prepared by STV on behalf of MTA NYCT. The properties are located in the Borough of Queens, New York, including Lots 41, 53, 60, 61, 63, 66, 68, and 72 within Block 10164. The Phase I ESA identified RECs in connection with the properties addressed as 103-16 Merrick Boulevard and 103-30 Merrick Boulevard. These properties historically including an auto repair shop and filling stations

with gasoline storage tanks. Additionally, an existing product plume at the Site and adjacent properties is considered a REC. Finally, based on open spills, undocumented tightness testing and known subsurface contamination, the Jamaica Bus Depot and BP Service Station #11009 represent RECs. The Phase I ESA revealed environmental concerns associated with the Site including suspect ACM, LBP on interior and exterior painted surfaces, suspect PCBs, and water staining and mold growth.

The report concluded that NYCT has performed extensive soil and groundwater investigations, including post-remediation sampling, at the Jamaica Bus Depot from approximately 2002 to the present. Based on the ongoing environmental monitoring being administered under NYSDEC Global Consent Order, active pump and treat remediation system, and numerous sub-surface environmental investigations that have been performed at the Jamaica Bus Depot, a Phase II Environmental Site Investigation (ESI) was not required. Based on the review of this existing information, recommendations were provided for engineering controls to be implemented during future site development. At a minimum, the following remedial actions and/or engineering controls are required to render the Site suitable for use:

1. Prior to any site redevelopment, a geophysical survey should be performed to determine if any underground storage tanks (USTs) are present at 103-16 Merrick Boulevard, 103-30 Merrick Boulevard and any other potential excavation locations. Additionally, in the event that a UST is discovered, an evaluation should be made at that time of the need for any additional investigation to determine whether soil and/or groundwater has been adversely impacted more than is currently documented.
2. As a safeguard to prevent potential volatile organic compounds in soil vapor from entering the new building in the future, a soil vapor barrier should be integrated into the new building design.
3. All material excavated during construction activities should be properly characterized and disposed, including collection and analysis of additional samples if required by the contractor-selected disposal facilities.
4. After the proposed new building and grounds are constructed, any exposed soil (landscaped areas) must be covered with at least two feet of environmentally clean fill.
5. Suspect ACM, LBP, PCB-containing materials and/or mold encountered during construction or excavation should be properly identified and managed.

5.7 Other Historical Sources

In 2012, STV was provided with several previous environmental reports pertaining to the area adjacent to the Site - the NYCT Jamaica Depot located at 165-18 South Road, Jamaica, Queens, NY. URS Corporation (URS) is currently providing environmental engineering services for the Jamaica Bus Depot in conjunction with NYCT's UST program. The work is being administered under NYSDEC Global Consent Order CO2-20000101-3341 dated May 2001. NYCT has been operating a pump and treat remediation system to recover a combined heating oil and diesel fuel release since 1995 at the Jamaica Bus Depot. NYSDEC spill #9010039 was initially reported on December 14, 1990 and continues to be an open case, along with several other spills that occurred consequently. Numerous investigations have been performed at the Jamaica Bus Depot by URS to evaluate the extent of product in the sub-surface and all possible in-situ remedial measures to address petroleum-impacted soil and groundwater. These are as follows:

- Soil Investigation Report, October 2002. This investigation consisted of the advancement of five soil borings within the plume and collecting soil samples to determine the presence and vertical extent of petroleum-impacted soil beneath the water table. This study was prompted by NYCDEP's intention to re-activate the Jamaica Water Supply wells for regional dewatering in 2007 which could lower the water table by as much as 16 feet. The study concluded that

product releases likely occurred when the water table was depressed during the previous operation of the Jamaica water supply system (pre-1996). However, soil impacts when compared with cleanup objectives were insignificant.

- Site-Specific Investigation Work Plan (SSIWP), May 2004. A soil and groundwater investigation was conducted in 2003 to determine the levels to which product had impacted soils relative to NYSDEC TAGM soil cleanup objectives, the results of which were reported in this SSIWP. Six borings were advanced with soil samples and groundwater samples were collected from nearby wells. The results imply that free product and the associated petroleum contaminants detected in soils were not significantly impacting dissolved-phase groundwater quality. The SSWIP also discussed the feasibility of bioremediation at the Jamaica Depot.
- Feasibility of Enhanced Product Recovery through Site-Wide Groundwater Depression, May 2004. This feasibility study (FS) was prompted by NYSDEC correspondence to URS dated April 29, 2004 that suggested that the product recovery system be enhanced or redesigned to increase product recovery through a significant increase in the pumping rate to overcome the rise in groundwater levels. The FS consists of dewatering calculations to determine the capacity of a remediation system capable of lowering the water table in the depot area by five feet. The pumping rate was estimated on the higher end of the range from 400 to 4,000 gpm, based on operating data from the existing system. The FS also stated that the product plume was currently trapped beneath the water table but was stable and not migrating.
- Site-Specific Remedial Plan (SSRP) for In-Situ Bioremediation Investigation, October 2004. In-situ enhanced bioremediation was recommended as the only feasible technology for soil remediation, considering the site constraints. Implementation would be done through the injection of a slurry of oxygen-releasing material in the subsurface. An investigation was performed in June 2004 to support this recommendation and thus acquire site-specific information pertaining to existing microbiologic conditions within and outside of the historic limits of the free product plume. Two borings were advanced (GP-7 and GP-8) near existing monitoring wells (W-10 and W-25) and samples were collected for both, respectively.
- Site-Specific Remedial Plan and Remedial Design (SSRP/RD) for Enhancing Product Recovery, March 2005. The SSRP/RD was designed to address the fact that effective in-situ technologies to treat trapped product are limited. At a meeting with NYSDEC and NYCT on February 25, 2005, one potential approach was identified utilizing the full capacity of a single extraction well for recovery in of product in that area. The SSRP/RD was approved in a letter dated May 5, 2005 by the NYSDEC for the use of one well (PW-4) to pump 170 gallons per minute (gpm) in order to lower the water table by four feet in an area extending 20-25 feet from the extraction point. If the design is successful, it will be utilized at a later date to address the rest of the plume.
- Remediation Analytical Data, 2008-2011. Groundwater quality is being monitored during remediation at the Jamaica Depot, as well as groundwater and product levels.

5.8 Historical Use Interviews

No other historical sources were available for interview.

6.0 REGULATORY AGENCY RECORD REVIEWS

The databases discussed in this section, provided by EDR, were reviewed for information regarding documented and/or suspected releases of regulated hazardous substances and/or petroleum products on or near the Site (*Appendix I*). STV also reviewed the "unmappable" (also referred to as "orphan") listings within the database report, cross-referencing available address information and facility names. Unmappable sites are listings that cannot be plotted with confidence, but are identified as being located within the general area of the Site based on the partial street address, city name, or zip code. In general, a listing cannot be mapped due to inaccurate or incomplete address information in the database that was supplied by the corresponding regulatory agency. Any listings from the unmappable summary which were identified by STV as a result of the area reconnaissance and/or cross-referencing to mapped listings are included in the corresponding database discussion within this section.

6.1 Federal and State Regulatory Agency Database Reviews

A review of federal and state records for the Site was accomplished by contacting offices of Federal and State regulatory agencies and review of the regulatory listings compiled in the regulatory agency database report (*Appendix I*). The results of the review of the Federal and State records are presented below. Copies of the correspondences are included in *Appendix K*.

United States Environmental Protection Agency (USEPA)
The USEPA is responsible for protecting human health and the environment. To that end, the USEPA develops and enforces regulations that implement environmental laws enacted by Congress. A Freedom of Information Law (FOIL) request dated October 1, 2015 was filed with the USEPA to determine if the agency holds additional records pertaining to the Site property. USEPA acknowledged the request on October 1, 2015. At the time this report was issued, STV had not yet received any further responses from USEPA. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

The status of the Site was also checked on USEPA's MyPropertyInfo website on September 30, 2015. A search of the databases did not locate any environmental records. A copy of the MyPropertyInfo result is included in *Appendix K*.

New York State Department of Environmental Conservation (NYSDEC)
The NYSDEC maintains files of incidents involving environmentally regulated materials, spill incidents, and state regulated cleanups. The records maintained by NYSDEC include reports of spills of hazardous chemicals and petroleum, petroleum bulk storage information, and site-specific environmental data. NYSDEC information concerning the Site property was requested in a FOIL records access application dated October 1, 2015. NYSDEC acknowledged the request on October 2, 2015. NYSDEC sent a response email dated October 13, 2015, indicating that no records have been located for the Site.

New York State Department of Health (NYSDOH)
The NYSDOH Records Access Office maintains files of health-related environmental incidents in the State of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYSDOH information concerning the Site property was requested in a formal letter dated September 30, 2015. NYSDOH acknowledged the request on September 30, 2015. NYSDOH sent a response letter dated October 23, 2015, indicating that no records have been located for the Site.

A summary of sites identified through the Federal and State regulatory agency database review is provided in the following table:

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
National Priorities List for Federal Superfund Cleanup (NPL)	03/26/2015	1 mile	0	No	No
Delisted NPL Site List	03/26/2015	1 mile	0	No	No
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), including CERCLIS NFRAP Sites	10/25/2013	½ mile	0/0	No	No
Resource Conservation and Recovery Information System – Corrective Action Activity (RCRIS CORRACTS) and Non-CORRACTS Treatment, Storage, or Disposal Facilities (RCRIS-TSD)	06/09/2015	1 mile / ½ mile	0/0	No	No
Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)	06/09/2015	¼ mile	1/2/4	No	**Yes**
RCRA Non-Generator	06/09/2015	¼ mile	17	No	**Yes**
Federal Institutional Control/Engineering Control Registries	06/09/2015	½ mile	0/0	No	No
Emergency Response Notification System (ERNS)	06/22/2015	Site	NA[1]	No	No
State Toxic Release Inventory System (TRIS)	12/31/2013	¼ mile	0	No	No
Hazardous Substance Waste Disposal Site Inventory (HSWDS)	01/01/2003	½ mile	0	No	No
New York State Inactive Hazardous Waste Disposal Sites (SHWS)	08/17/2015	1 mile	3	No	No
Solid Waste Management Facilities Sites (SWF/LF)	06/24/2015	½ mile	13	No	**Yes**
Vapor Reopened	11/01/2014	1 mile	1	No	No
New York State Spills Information (NY Spills)/Leaking Underground Storage Tanks (LTANKS)	08/17/2015	½ mile 1/8 mile	20/31	No	**Yes**
Petroleum Bulk Storage Tanks (USTs/ASTs)	07/29/2015	¼ mile	7/13	No	**Yes**
NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)	01/01/2002	¼ mile	0/1	No	**Yes**
NY Chemical Bulk Storage Tanks (NY CBS)	07/29/2015	¼ mile	2	No	**Yes**
Historic Bulk Storage Tanks (USTs/ASTs)	01/01/2002	¼ mile / Site	1/0	No	**Yes**
New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)	08/17/2015	1 mile	0/1	No	No
E-Designation Site (E)	05/27/2015	1/8 mile	30	**Yes**	**Yes**

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
Registered Dry Cleaners	07/02/2015	½ mile	0	No	No
EDR US Hist Auto Stat	NA	¼ mile	39	**Yes**	**Yes**
EDR US Hist Cleaners	NA	½ mile	1	No	**Yes**
NY Manifest	08/01/2015	¼ mile	22	No	**Yes**
NJ Manifest	12/31/2013	¼ mile	4	No	**Yes**
RI Manifest	12/31/2013	¼ mile	1	No	**Yes**
Manufactured Gas Plant Sites (Coal Gas)	NA[2]	1 mile	1	No	No

* The surrounding area search radius indicates the radial area (measured from the perimeter of the Site) for which the database review was performed.
[1]NA – Not Applicable
[2] This database consists of a compilation of historic resources (as early as the late 1800s) prepared by EDR that does not require updates. The last MGP in New York State ceased operations in 1972.

The Site is listed in the E-Designation and EDR US Hist Auto Stat databases. The following subsections provide a discussion of the listings that have been identified within the search radii and are in the table above:

National Priorities List of Federal Superfund Cleanup (NPL)
The NPL is a subset of the CERCLIS, and lists properties that are ranked as high priority for cleanup under the federal Superfund program. Neither the Site nor any other facility within one mile of the Site is listed in the NPL Site List.

Delisted NPL Site List
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the USEPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425 (e), sites where no further response is appropriate may be deleted from the NPL. Neither the Site nor any other facility within one mile of the Site is listed in the Delisted NPL Site List.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
The CERCLIS list is a compilation of known and suspected uncontrolled or abandoned hazardous waste sites which are, or were, under investigation by USEPA but have not been elevated to the status of a Superfund (NPL) site. Former CERCLIS sites that have been granted the status of No Further Remedial Action Planned (NFRAP) are also included in the database. Neither the Site nor any other facility within one-half mile of the Site is listed in the CERCLIS or CERCLIs NFRAP databases.

Resource Conservation and Recovery Information System (RCRIS) – Treatment, Storage, or Disposal Facilities (TSD) and RCRIS Corrective Action Activity (CORRACTS)
The RCRA program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRIS database tracks facilities that treat, store, and/or dispose of hazardous waste as defined by RCRA (referred to as TSD facilities). The RCRIS CORRACTS database identifies TSD facilities that have conducted, or are currently conducting, corrective action(s) as regulated under RCRA.

Neither the Site nor any other facility within one mile of the Site is listed in the RCRIS CORRACTS database and neither the Site nor any other facility within one-half mile of the Site is listed in the RCRIS-TSD database.

Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)
This list includes operations that generate or transport hazardous waste for which a hazardous waste generator identification number or transporter permit is required. The RCRIS Gen/Trans listing is merely a listing of all facilities that, due to the amount of hazardous waste generated, are required to register with the USEPA for tracking purposes, but are not necessarily those with reported contamination incidents. The Site was not listed in the RCRIS Gen/Trans database.

One (1) RCRA Large Quantity Generator (RCRA-LQG) was listed within a one-quarter mile radius of the Site. Based on its distance from the Site and lack of reported violations, this RCRA-LQG listing is not anticipated to have affected the environmental integrity of the Site.

Two (2) RCRA Small Quantity Generators (RCRA-SQG) were listed within a one-quarter mile radius of the Site. The following RCRA-SQG facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
R&S Parts & Service Inc. dba Strauss Auto 168-08 Liberty Avenue Jamaica, NY 11433	689-ft/North	Up-gradient	H83	EPA ID: NYD980758080. The Site is also listed on the NY Manifest database. Facility generates spent halogenated solvents.

Based on its distance from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow direction, the other RCRA-SQG listing is not anticipated to have affected the environmental integrity of the Site.

Four (4) RCRA Conditionally Exempt Small Quantity Generators (RCRA-CESQG) were listed within a one-quarter mile radius of the Site. The following RCRA-CESQG facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCTA 165-18 South Road Jamaica, NY 11433	520-ft/Northwest	Cross-gradient	F55	EPA ID: NYD980642268. The Site is also listed on the US AIRS, NJ Manifest, and RI Manifest databases. Facility generates cadmium, lead, and waste oils and has listed violations associated with its operations.

Based on their distance from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow direction, the other RCRA-CESQG listings are not anticipated to have affected the environmental integrity of the Site.

Resource Conservation and Recovery Information System Non-Generators / No Longer Reporting (RCRA NonGen / NLR)

RCRAInfo is USEPA's comprehensive information system, providing access to data supporting the RCRA of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the RCRA. Non-Generators do not presently generate hazardous waste. The Site is not listed in the RCRA NonGen / NLR database.

Seventeen (17) RCRA NonGen / NLR facilities were identified within a one-quarter mile radius of the Site. The following RCRA NonGen / NLR facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	703-ft/Northwest	Up-gradient	I85	EPA ID: NYD986903763. The Site is also listed on the NY Manifest database. The facility is a retail gasoline filling station.
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	261-ft/East-southeast	Down-gradient	D34	EPA ID: NYD981874407. The Site is also listed on the NY Manifest database.
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	420-ft/East-southeast	Down-gradient	D45	EPA ID: NYD987030012. The Site is also listed on the NY Manifest database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.

None of the other RCRA Non/Gen /NLR listings are anticipated to have affected the environmental integrity of the Site, based on their distances from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow directions.

Federal Institutional Control/Engineering Control Registries

The Federal Institutional Control/Engineering Control Registries are listings of sites with engineering controls and/or institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining at a site. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or affect human health. Neither the Site nor any other facility within one-half mile of the Site is listed in the Federal Institutional Control/Engineering Control Registries.

Emergency Response Notification System (ERNS)

The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances. The Site is not listed in the ERNS database.

New York State Toxic Release Inventory System (TRIS)
The Toxic Release Inventory System (TRIS) is a database used to collect information and report releases of toxic chemicals to the air, water, and land in reportable quantities. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the TRIS database.

Hazardous Substance Waste Disposal Site Inventory (HSWDS)
The list includes any known or suspected hazardous substance waste disposal sites. Also included are sites delisted from the Registry of Inactive Hazardous Waste Disposal Sites and non-Registry sites that USEPA Preliminary Assessment (PA) reports or Site Investigation (SI) reports were prepared. Hazardous Substance Waste Disposal Sites are eligible to be Superfund sites. The sites on the list will not automatically be made Superfund sites; rather each site will be further evaluated for listing on the Registry. Neither the Site nor any other facility within one-half mile of the Site is listed in the HSWDS database.

New York State Inactive Hazardous Waste Disposal Sites (SHWS)
The New York State Inactive Hazardous Waste Disposal Sites database, compiled by the NYSDEC, maintains information regarding the investigation and cleanup of suspected hazardous waste sites. The Site is not listed in the SHWS database.

Three (3) SHWS facilities were listed within a one-mile radius of the Site. Based on their distances from the Site (greater than one-quarter mile) and/or inferred down-gradient groundwater flow direction, these SHWS facilities are not anticipated to have affected the environmental integrity of the Site.

Solid Waste Management Facilities Sites (SWF/LF)
The SWF/LF database is a comprehensive listing of State permitted/recorded solid waste management facilities. The Site is not listed in the SWMF database.

Thirteen (13) SWF/LF facilities were listed within a one-half mile radius of the Site. The following SWF/LF facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Taylor Auto Collision 104-21 Merrick Blvd. Jamaica, NY 11433	208-ft/North	Up-gradient	A20	The Site was engaged in vehicle dismantling. The Site is inactive.
Junk Yard International 169-09 Liberty Avenue Jamaica, NY 11433	870-ft/North-northeast	Up-gradient	K101	The Site was engaged in vehicle dismantling. The Site is inactive.
S&S Super Sports Auto Care Inc. 94-40 Merrick Blvd. Jamaica, NY 11433	973-ft/North-northwest	Up-gradient	M113	The Site was engaged in vehicle dismantling. The Site is inactive.

Based on their distances from the Site and/or inferred down-gradient groundwater flow direction, the other SWF/LF facilities are not anticipated to have affected the environmental integrity of the Site.

Vapor Reopened

New York is currently re-evaluating previous assumptions and decisions regarding the potential for soil vapor intrusion exposures at sites. As a result, all past, current, and future contaminated sites will be evaluated to determine whether these sites have the potential for exposures related to soil vapor intrusion. The Site is not listed in the Vapor Reopened database.

One Vapor Reopened facility was listed within a one-mile radius of the Site. The facility is identified as West Side Corp., and is located 3,441-ft east of the Site at 107-10 180th Street. This facility is also listed in the NY UST and Historical UST databases. The site contains soil vapor and contaminated groundwater above guidance values. Based on its distance from the Site and/or inferred down-gradient groundwater flow direction, this Vapor Reopened listing is not anticipated to have affected the environmental integrity of the Site.

New York State Spills Information Database (NY Spills)/Leaking Underground Storage Tanks (LTANKS)

The NY Spills database, including LTANKS sites, was researched to identify listings within one-half mile of the Site. The database search identified 20 reported NY Spills and 31 LTANKS incidents within one-half mile of the Site. The Site is not listed in the NY Spills/LTANKs databases.

The following NY Spills / LTANKS facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	520-ft/Northwest	Cross-gradient	F58	Spill No. 9010039 was reported on 12/14/90. The spill was the result of a tank test failure. The spill is not closed. There are known petroleum-impacted soils and groundwater. NYCT has been operating a pump and treat system since 1995.

Based on distance from the Site combined with the assumed hydraulic relationship and/or the nature of the incident/regulatory status, none of the other facilities located within one-half mile of the Site identified in the NY Spills/LTANKS databases are expected to impact the environmental integrity of the Site.

Petroleum Bulk Storage Tanks (USTs/ASTs)

The NYSDEC PBS tank database was researched to identify listings for the Site and adjacent properties. The PBS Tank database is a listing of all facilities that are required to register their storage tanks for tracking purposes and not necessarily those with reported contamination incidents. The Site is not listed in the PBS tank database.

A total of 20 facilities (7 UST sites and 13 AST sites) were identified within one-quarter mile from the Site. The following UST facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BHELA 105-15 Merrick Blvd. Jamaica, NY 11433	116-ft/East	Up-gradient	A16	PBS No. 2-601509. The Site is an active retail gasoline filling station. The site has three (3) 4,000-gallon gasoline USTs and one (1) 4,000-gallon diesel UST. The Site is also listed on the NY AST database.
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	520-ft/Northwest	Cross-gradient	F56	PBS No. 2-190225. The site has five (5) 4,000-gallon diesel USTs and five (5) 4,000-gallon biodiesel UST. There are two (2) 15,000-gallon #6 fuel oil USTs and twelve (12) 2,000-gallon diesel USTs that are closed-in-place. There are two (2) 15,000-gallon #2 fuel oil USTs that are temporarily out-of-service. The site has a history of spills with one open spill case.
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	703-ft/Northwest	Up-gradient	I84	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-gallon #2 fuel oil UST that are all closed-in-place.

Based on distance from the Site, assumed hydraulic relationship, the lack of known releases with the potential to affect the Site, and/or current regulatory status, none of the other facilities identified within one-quarter mile of the Site in the PBS database are expected to impact the environmental integrity of the Site.

NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)

The NYSDEC chemical bulk storage (NY CBS UST/AST) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS UST/AST database lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons and/or in underground tanks of any size. The Site was not identified on the NY CBS UST/AST database.

One facility was listed within one-quarter mile of the Site. This NY CBS UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	520-ft/Northwest	Cross-gradient	F61	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS, and NY Spills databases.

NY Chemical Bulk Storage (NY CBS)
The NYSDEC chemical bulk storage (NY CBS) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons. The Site was not identified on the NY CBS database.

Two (2) facilities were listed within one-quarter mile of the Site. The following facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	520-ft/Northwest	Cross-gradient	F61	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Based on its distance from the Site, the other NY CBS listing is not anticipated to have affected the environmental integrity of the Site.

Historical Bulk Storage Tanks (USTs/ASTs)
These facilities have petroleum bulk storage capabilities in excess of 1,100 gallons and less than 400,000 gallons. This database contains detailed information per site. This database is no longer updated. More current data is presented in the PBS UST/AST databases. The Site is not listed in the HIST UST/AST databases.

The database identified the presence of one (1) historic UST facility located within one-quarter mile of the Site. This HIST UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	703-ft/Northwest	Up-gradient	I84	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
				gallon #2 fuel oil UST that are all closed-in-place.

New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)
The Voluntary and Brownfield remedial programs involve mostly private entities and private funds to remediate contaminated sites and return the properties to productive use. The NYSDEC VCP/BCP database was researched to identify listings for the Site and within a one-mile radius of the Site. The Site is not listed in the VCP/BCP databases.

One (1) BCP facility is listed within one mile of the Site. Based on its distance from the Site and/or inferred down-gradient groundwater flow direction, this BCP listing is not anticipated to have affected the environmental integrity of the Site.

E-Designation Site Listing (E-Designation)
The E (Environmental) Designation would ensure that sampling and remediation take place on the subject properties, and would avoid any significant impacts related to hazardous materials at these locations. The E-designations require that the owner of the sites conduct testing and sampling following set protocols, to the satisfaction of city agencies. In addition, the owner must remediate when appropriate. The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing for the Site for hazardous materials is considered to be a REC/VEC.

The database identified thirty (30) E-Designation listings within a one-eighth-mile radius of the Site. The listings are associated with E-designation reference No. E-39 (Underground Gasoline Storage Tanks Testing Protocol) and E-175 (Underground Gasoline Storage Tanks Testing Protocol). The listed sites are all considered as RECs/VECs with respect to the Site.

Registered Dry Cleaners
The NYSDEC registered dry cleaners database was researched to identify listings within one-quarter mile of the Site. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the dry cleaners database.

EDR Exclusive Historic Auto Stations (EDR US Hist Auto Stat)
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

The Site is listed in the EDR US Hist Auto Stat database and is considered an onsite REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
104-28 Merrick Blvd. Jamaica, NY 11433	Target Property	NA (Site)	A2	Identified as AAA Transmissions & Engines. Listed for years 2004, 2005, and 2009.

The database search identified 38 other listings within one-quarter mile of the Site. The EDR Hist Auto Stat facilities that are considered RECs/VECs with respect to the Site are as follows:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
105-09 Merrick Blvd. Jamaica, NY 11433	82 feet/ East-northeast	Cross-gradient	A11	Identified as Inter City Tire Corp. Listed for year 2006.
105-15 Merrick Blvd. Jamaica, NY 11433	90 feet/ East	Cross-gradient	A14	Identified as Citgo Gas Station and Henrys Repair Shop. Listed for years 1999-2001.
105-17 Merrick Blvd. Jamaica, NY 11433	93 feet/ East	Cross-gradient	A15	Identified as Fred's Auto Repair. Listed for year 2002.
104-21 Merrick Blvd. Jamaica, NY 11433	212 feet/ North	Up-gradient	C21	Identified as Taylor Auto Collision Inc. Listed for years 1999-2002, 2004-2009, and 2011.
104-19 Merrick Blvd. Jamaica, NY 11433	218 feet/ North	Up-gradient	C23	Identified as Full Line Auto Repairs. Listed for years 1999-2001, 2003-2007, and 2009-2012.
104-15 Merrick Blvd. Jamaica, NY 11433	231 feet/ North	Up-gradient	C25	Identified as Dynamic Autoworks Inc., Ace Auto Body & Truck Repair, Jimmy's Trans & Auto Repair, and Sports Line Auto Repair. Listed for years 1999-2005, 2008, 2010, and 2012.
104-13 Merrick Blvd. Jamaica, NY 11433	237 feet/ North	Up-gradient	C27	Identified as Full Line Auto Repairs. Listed for year 2002.
104-09 Merrick Blvd. Jamaica, NY 11433	249 feet/ North	Up-gradient	C29	Identified as Junior Auto Collision, RJS Car Care Center Inc., L&C Auto Collision, NASCAR Auto Body Inc., and Integrity Collision & Towing. Listed for years 2001-2012.
103-16 Merrick Blvd. Jamaica, NY 11433	447 feet/ North-northwest	Cross-gradient	C47	Identified as The Car Doctor and Breeze Auto Collision & Repair. Listed for years 1999-2001 and 2003.
105-02 Merrick Blvd. Jamaica, NY 11433	37 feet/ East	Cross-gradient	A4	Identified as Garvey's Auto Repair and Ralke Auto Repairs. Listed for years 1999, 2000, 2011, and 2012.
106-04 Merrick Blvd. Jamaica, NY 11433	261 feet/ East-southeast	Down-gradient	D33	Identified as Birds Auto Repair. Listed for years 1999-2012.
106-03 Merrick Blvd. Jamaica, NY 11433	264 feet/ East-southeast	Down-gradient	D35	Identified as Truck Repair Services. Listed for years 2011 and 2012.

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
107-17 Merrick Blvd. Jamaica, NY 11433	595 feet/ Southeast	Down-gradient	G73	Identified as E&D Auto Seat Cover, Dave's Precision Auto Service Inc., Inspection City Auto Repair Inc., and Haldane Auto Service. Listed for years 1999-2008 and 2010-2012.

Due to their distances from the Site and/or the presumed groundwater flow direction none of the other EDR Hist Auto Stat facilities are considered RECs/VECs with respect to the Site.

EDR Exclusive Historic Dry Cleaners (EDR US Hist Cleaners)
EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is not listed in the EDR US Hist Cleaners database.

The database search identified one (1) listing within one-half mile of the Site. This facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
107-37 166th Street Jamaica, NY 11433	803 feet/ South-southeast	Down-gradient	J93	Identified as ABD Cleaners Corp. Listed for year 2009.

NY Manifest
The NY Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the NY Manifest database.

Twenty-two (22) NY Manifest facilities were identified within one-quarter mile of the Site. The following NY Manifest facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	703-ft/Northwest	Up-gradient	I85	EPA ID: NYD986903763. The Site is also listed on the RCRA NonGen / NLR database. The facility is a retail gasoline filling station.
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	261-ft/East-southeast	Down-gradient	D34	EPA ID: NYD981874407. The Site is also listed on the RCRA NonGen / NLR database.
Calvin Auto Body	420-ft/East-	Down-gradient	D45	EPA ID: NYD987030012.

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
106-04A Merrick Blvd. Jamaica, NY 11433	southeast			The Site is also listed on the RCRA NonGen / NLR database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NY Manifest facilities are expected to impact the environmental integrity of the Site.

NJ Manifest

The NJ Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the NJ Manifest database.

Four (4) NJ Manifest facilities were identified within one-quarter mile of the Site. The following NJ Manifest facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCT 165-18 South Road Jamaica, NY 11433	520- ft/Northwest	Cross-gradient	F55	The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NJ Manifest facilities are expected to impact the environmental integrity of the Site.

RI Manifest

The RI Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the RI Manifest database.

One (1) RI Manifest facility was identified within one-quarter mile of the Site. The following RI Manifest facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCT 165-18 South Road Jamaica, NY 11433	520- ft/Northwest	Cross-gradient	F55	The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Manufactured Gas Plant Sites (Coal Gas)
Manufactured gas sites were used in the United States from the 1800's to the 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water and produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils, and other compounds are potentially hazardous to human health and the environment. The byproducts were frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination. The Manufactured Gas Plant (MGP) Sites database was researched to identify any listings for the Site and within a one-mile radius of the Site. The Site is not listed in the MGP database.

One (1) facility within one mile of the Site is listed in the MGP database. The facility is identified as Jamaica Gas and Light and is located approximately 3,014-ft west of the Site at Beaver Road and 158th Street. Due to its distance from the Site and/or the presumed groundwater flow direction this facility is not considered a REC/VEC with respect to the Site.

Orphan Listings
A review of the Orphan Listings in the database search report indicated a total of four (4) listings. The Orphan sites are not considered RECs based on their estimated distances from the Site (none adjacent or on the Site block) and/or the nature of the activity/release.

6.2 Local Regulatory Agency Research

A review of local records for the Site was accomplished by contacting offices of New York City regulatory agencies including the NYCDOB, NYCDEP, Department of Health and Mental Hygiene (NYCDOHMH), NYCDCP, and the Fire Department (FDNY). The results of the review of local records are presented below. Copies of the correspondences are included in *Appendix K*.

New York City Department of Buildings (NYCDOB)
NYCDOB records were reviewed on November 13, 2015 to determine whether there are references to buildings, tanks or other structures, property use or inspection reports that indicate the presence, past use, or release of hazardous substances, wastes, or petroleum products at the Site. The NYCDOB records review indicated that the Site has no NYCDOB violations. There were no RECs identified as a result of review of NYCDOB records. Copies of the NYCDOB records are included in *Appendix J*.

New York City Department of Environmental Protection (NYCDEP)
The NYCDEP maintains files of incidents involving environmentally regulated materials. The records maintained by NYCDEP include reports of spills of hazardous chemicals and citizen's complaints on environmental issues. NYCDEP information concerning the Site was requested in a formal application for records dated October 1, 2015. At the time this report was issued, STV had not yet received a response from NYCDEP. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of Health and Mental Hygiene (NYCDOHMH)
The NYCDOHMH, Bureau of Environmental Investigations (BEI) maintains files of health-related environmental incidents in the City of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYCDOHMH information concerning the Site was requested in a formal FOIL request form dated October 1, 2015. NYCDOHMH acknowledged the request on October 6, 2015. At the time this report was issued, STV had not yet received any response from NYCDOHMH. Upon receipt of this

information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of City Planning (NYCDCP)
STV reviewed the NYCDCP Zoning Map 14d, available via the NYCDCP on-line web-site. According to the map, the Site is currently located within zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

"E" designations for blocks or lots on city zoning maps were issued since approximately March 2003 and indicate that potential environmental issues are associated with these parcels. The environmental issues may or may not be associated with potential contamination by hazardous or petroleum substances. Parcels with "E" designations require that the fee owner of the site conduct a testing and sampling protocol, and remediation where appropriate, to the satisfaction of the New York City Office of Environmental Remediation (NYCOER) before the issuance of a building permit by the NYCDOB pursuant to the provisions of Section 11-15 of the Zoning Resolution (Environmental Requirements).

The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing for the Site for hazardous materials is considered to be a REC/VEC.

New York City Fire Department (FDNY)
The FDNY maintains information concerning petroleum USTs. STV submitted a Fuel Oil Record Search Request Form to the FDNY on October 1, 2015 for information concerning the Site. At the time this report was issued, STV had not yet received a response from FDNY. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

7.0 USER RESPONSIBILITIES

7.1 Environmental Liens or Activity and Use Limitations

An Environmental Lien Search Report was obtained from EDR for the Site. The Environmental Lien Search Report provides results from a search of available and current land title records for environmental liens and other activity and use limitations, such as engineering controls and institutional controls. A review of the report indicates that no environmental liens or other activity and use limitations were found for the Site. A copy of the environmental lien search report is included in *Appendix J*.

7.2 Valuation Reduction for Environmental Issues

No information was available at the time of the assessment regarding the relationship of the purchase price of the property to the fair market value of the property. If information is received regarding valuation reduction for environmental issues which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.3 Knowledge or Experience of the User

No person with specialized knowledge or experience that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment other than Mr. Ron Bello, owner of RVM Wheels (the shop currently occupying the Site). If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.4 Commonly Known or Reasonably Ascertainable Information

No person within the local community with commonly known or reasonably ascertainable information about the property that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.5 The Degree of Obviousness of the Presence or Likely Presence of Contamination at the Property

NYCT is not currently aware of any obvious indicators that point to the presence or likely presence of new or imminent releases at the property. Additionally, NYCT is not currently aware of any obvious indicators important to the screening of VECs in connection with the property.

8.0 SITE RECONNAISSANCE AND INTERVIEWS

8.1 Methodology and Limiting Conditions

The inspection of the Site included observations of the property and surrounding area (Site reconnaissance) that were made to identify potential sources or indications of hazardous substances, including: ASTs; USTs; tank vents and fill ports; transformers and other items that could contain PCBs; waste storage areas; hazardous materials usage, storage, and disposal; stained surfaces and soils; stressed vegetation; leaks; and, odors. In addition, readily-observable portions of the properties immediately adjacent to the Site were viewed from public rights-of-way to identify or determine the likelihood of any of the aforementioned potential sources of contamination being present. There were no limiting conditions with respect to impact on the accuracy of the Site reconnaissance.

8.2 Site Reconnaissance

Mr. Doane Cafferty of STV performed the Site visit on November 12, 2015, and was accompanied by Mr. Ron Bello, the property owner. At the time of the inspection, the weather was approximately 50º F with sunny skies. The weather did not prevent STV from conducting a thorough inspection of the Site and surrounding areas. *Appendix C* provides representative photographs of the Site.

Block 10164, Lot 74 is an approximately 8,230 square-foot (sf) property that contains a one-story building with a partial basement constructed in 1931. The building was previously occupied by 'RVM Wheels', a custom wheel, tire, and rim supply and repair shop. The business is divided into two distinct areas; the garage and the showroom. The garage is a large open space with concrete floors accessible through overhead doors and is unfinished. Piping was observed to be suspended from the ceiling. Merchandise is stocked on shelving throughout the space and there is an area in the front where there are multiple tire changer machines/wheel balancers. The back of the garage contains two large Haas work stations used to machine aluminum or alloy wheels. The showroom is finished with a front display room full of various types of wheels and office space. The interior finishes consisted of linoleum flooring, sheetrock walls, acoustic ceiling tiles, and fluorescent lighting. Access to both the garage space and showroom is via entrances along Merrick Boulevard. Access to the partial basement is via bilco door hatches in the sidewalk area along Merrick Boulevard.

The Site is bound to the north by several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south by a fenced lot used for parking and a one-story commercial office building, bus depot parking lots, a mixed-use residential/commercial building, an auto collision repair shop, and subsequently 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street.

The garage portion of the Site is not heated. The showroom is heated via Con Edison natural gas. Potable water service is provided by NYCDEP.

8.3 Current and Historical Use Interviews

The following knowledgeable persons were interviewed with regard to the Site pursuant to ASTM 1527-13 Section 10:

8.3.1 Current Property Owner

The subject property is currently owned by 'NAV Enterprises Inc.'. Based on the research, this entity has owned the Site since at least 2009. All prior ownership information reviewed is presented in *Appendix J*. The review of current and historical ownership and tax records information did not reveal evidence of RECs or VECs associated with prior use of the Site.

8.3.2 Current Site Operator or Key Site Manager

Name	Title/Company	Years Associated with Site
Mr. Ron Bello	NAV Enterprises Inc.	Approx. 6

Detailed information provided during the above-listed interview is documented on Record of Communication forms in *Appendix K*.

8.3.3 Site Occupants

Other than the Owner's representative, Site occupants were not available to interview during this assessment.

8.3.4 Past Owners, Operators and Occupants

Past owners or occupants of the Site were not available to interview during this assessment. STV was unable to obtain contact information from any previous owners or occupants.

8.3.5 Report User

Name	Title/Company	Years Associated with Site
Me. Emil Dul	NYCT Real Estate Department	<1

According to the ASTM E 1527-13 User Questionnaire provided by Mr. Emil Dul of NYCT's Real Estate Department, NYCT is not aware of any environmental liens, land use limitations, specialized knowledge, or past uses of the Site. Detailed information provided during the above-listed interviews is referenced in applicable sections of this report and a copy of the completed ASTM E1527-13 User Questionnaire is included in *Appendix K*.

8.4 Hazardous Substances and Petroleum Products Storage and Handling

8.4.1 Hazardous Substances

Two 5-gallon containers of flashing cement and some paints and cleaning supplies were stored in the partial basement. There was no visual or olfactory evidence of leakage or floor staining in the area where this material was stored. STV concludes that storage and handling of hazardous substances do not represent a REC or VEC for the Site.

8.4.2 Petroleum Products Storage and Handling

No evidence of petroleum product storage was observed at the Site other than a propane tank in a safety cage that was located outside in back of the building. The Site was previously heated by fuel oil but the boiler and fuel oil tank were removed sometime prior to RVM Wheels occupancy. A fill port is located in the sidewalk in front of the Site along Merrick Boulevard. The fill port piping can be seen terminating just beneath the sidewalk level inside the bilco sidewalk hatch door that provides access to the buildings partial basement. Some remnant piping was observed along the ceiling inside the partial basement. No exterior vent lines were noted. STV concludes that storage and handling of petroleum products does not represent a REC or VEC for the Site.

8.5 Solid Waste Generation, Storage and Disposal

No containers for solid waste were observed on the Site. Solid waste generation, storage, and disposal are not considered a REC or a VEC with respect to the Site.

8.6 Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are toxic components of various products including, but not limited to caulking materials, light ballasts, and dielectric and hydraulic fluids that were formerly used in electrical equipment such as transformers and hydraulic elevators/lifts. The manufacture and use of PCBs was banned in the United States in 1978.

STV did not observe any electrical transformers on or adjacent to the Site. Fluorescent lighting fixtures and window caulking were identified throughout the Site. Based on the age of the Site building (circa 1931), there is a potential for the presence of suspect PCB-containing light ballasts and caulking materials. These materials represent an environmental concern with respect to the Site.

8.7 Asbestos-Containing Material (ACM)

STV conducted a limited visual survey (i.e., within accessible areas only) for the presence of suspect ACM within the Site. The intent of the survey was to identify exposed suspect ACM through preliminary non-destructive observations. No sampling of suspect ACM was performed during this investigation. Pursuant to applicable asbestos control regulations and guidelines, STV considered any observed suspect materials to be asbestos-containing.

Potential ACM at the Site consisted of acoustic ceiling tiles, tile grout, tile mortar, pipe insulation, pipe insulation paper, caulking, vinyl floor tiles, mastics, and gypsum board and joint compound. These materials were found to be in generally good condition. The suspect ACM identified at the Site is considered an environmental concern.

8.8 Lead-Based Paint (LBP) Survey

During the Site inspection, a limited visual assessment of all accessible painted surfaces was performed. No sampling or intrusive work was performed as this is outside the scope of work of this assessment. All painted surfaces are assumed to be LBP.

Interior painted surfaces of the Site were generally found to be in good condition. Painted surfaces were observed on the interior brick of the building and window sills. Based on the age of the Site building (circa 1931) LBP is an environmental concern.

8.9 Regulatory Compliance

STV does not consider regulatory compliance to be an environmental concern for the Site.

8.10 Electromagnetic Fields

A visual inspection was performed for the presence of high voltage power lines and or substations located in close proximity to the Site. No such power lines or substations were identified; therefore, STV does not consider electromagnetic fields to be an environmental concern at the Site.

8.11 Other Environmental Concerns (Methane, Mold, etc.)

Based on a review of the historic topographic map and knowledge of the area, the Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site.

As part of this assessment, STV conducted a limited assessment for the presence of water damage and odors, indicative of the potential for mold growth, on accessible surfaces within the Site. There was no evidence of water damage or mold noted during the Site inspection.

9.0 SUMMARY OF FINDINGS

The Site is located at 104-28 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 74). Block 10164, Lot 74 is an approximately 8,230 square-foot (sf) property that contains a one-story building constructed in 1931. The building was previously occupied by 'RVM Wheels', a custom wheel, tire, and rim supply and repair shop.

The Site is bound to the north by several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south by a fenced lot used for parking and a one-story commercial office building, bus depot parking lots, a mixed-use residential/commercial building, an auto collision repair shop, and subsequently 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street.

NYCDCP Zoning Map 14d indicated the Site is designated as zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol).

The Site is generally flat and the topography of the surrounding area slopes to the south-southeast. According to the USGS 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, and information contained in the regulatory agency database report, the Site elevation is approximately 30 feet amsl.

The nearest surface water body is a pond in Captain Tilly Park, located approximately 4,600 feet north-northwest of the Site. Based on topography, the groundwater flow in the area of the Site is assumed to be south-southwest towards Jamaica Bay. The depth to groundwater is estimated to range from approximately 20-25 feet bgs.

The Phase I ESA identified on-Site RECs pertaining to potential buried structures from former buildings that could contain underground storage tanks and/or historic fill materials of unknown origin; the current historical use of the Site as an auto repair facility and auto parts manufacturing facility; and the Site's listing with an E-Designation for underground storage tanks testing protocol.

Off-site RECs include three solid waste management facilities; a nearby facility with an open spill; one facility that currently generates spent halogenated solvents; one facility that historically generated cadmium, lead, and waste oils; an active gas station; several historical and current auto repair facilities; one historic dry cleaner; several nearby properties with E-Designation listings for underground storage tanks testing protocol; and the historical presence of a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs in close proximity to the Site. The Phase I ESA revealed environmental concerns associated with suspect ACM, LBP, PCB-containing materials.

10.0 CONCLUSIONS AND RECOMMENDATIONS

STV has performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527-13 and the requirements of NYCT. Any additions to, exceptions to, or deletions from this practice are described in Section 2.0 of this report.

The Phase I ESA has revealed the following RECs, CRECs, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The historic use of the Site as an auto repair facility and auto parts manufacturing facility is considered a REC/VEC.

- The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that generates spent halogenated solvents is located in close proximity to the Site and is considered a REC/VEC.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- A facility with an open spill is located northwest of the Site at 165-18 South Road. This property is considered a REC/VEC based on its proximity to the Site and hydraulically cross-gradient position with respect to the Site.

- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Suspect ACM consisting of acoustic ceiling tiles, tile grout, tile mortar, pipe insulation, caulking, vinyl floor tiles, mastic, and gypsum board and joint compound exists throughout the Site.
- Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.
- Fluorescent lighting fixtures and window caulking identified throughout the building may contain PCBs.

Recommendations

STV recommends that any ACM, LBP, and/or PCB-containing materials affected by future renovations, repairs or demolition at the Site be identified and properly managed during such activities. If the NYCT considers purchasing the property in the future, or if future development requires soil disturbance, a comprehensive Phase II Environmental Site Investigation should be conducted.

11.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

STV Incorporated (STV) has performed a Phase I ESA of the property located at 104-28 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 74). The scope of the Phase I ESA was consistent with the requirements of ASTM Standard Practice E 1527-13 and of NYCT. Signatures of the Environmental Professionals who participated in conducting this Phase I ESA are provided below. Qualifications for these individuals are provided in *Appendix L*. STV declares that to the best of their professional knowledge and belief, they meet(s) the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. STV has the specific qualifications based on education, training and experience to assess the subject property. STV has developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Prepared By:
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Senior Environmental Scientist

Reviewed By:
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Quality Control Officer

Reviewed By:
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12.0 REFERENCES

Persons Interviewed:

- Mr. Ron Bello, NAV Enterprises Inc., 104-28 Merrick Blvd., Jamaica, Queens, New York, November 12, 2015.

Resources Consulted:

- EDR – Radius Map™ Report with GeoCheck®, September 29, 2015.
- EDR – Historical Sanborn® Maps: 1891, 1897, 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006.
- EDR – Aerial Photographs: 1951, 1954, 1961, 1966, 1975, 1994, 2006, 2009, and 2011.
- EDR – USGS Historical Topographic Maps: 1900, 1924, 1947, 1957, 1966, 1979, and 1994.
- EDR – City Directories: 1922, 1934, 1939, 1945, 1950, 1962, 1967, 1970, 1976, 1983, 1991, 1996, 2000, 2005, 2008, and 2013.
- EDR - Environmental Lien Search dated September 29, 2015.
- NYC Department of Finance – Assessment Roll: 2006-2015.
- Oasis Website - www.oasisnyc.net/OASISMap.htm.
- FEMA Map Services Center Website - www.msc.fema.gov
- National Wetlands Inventory Website - www.fws.gov/nwi/
- USGS New York Water Science Center http://ny.ims.er.usgs.gov/li-dtw/ and http://ny.ims.er.usgs.gov/LI_maps06

Regulatory Agencies Contacted:

- New York City Department of Buildings, October 1, 2015.
- New York City Fire Department, October 1, 2015.
- New York City Planning and Zoning Department, October 1, 2015.
- New York City Department of Environmental Protection, October 1, 2015.
- New York City Department of Health and Mental Hygiene, October 1, 2015.
- New York State Environmental Conservation, October 1, 2015.
- New York State Department of Health, October 1, 2015.
- Unites States Environmental Protection Agency, October 1, 2015.

Documents and Maps:

- ASTM International (ASTM) 2013, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," ASTM Designation E 1527-13.
- ASTM E 2600-10 "Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions."
- STV Potential Property Acquisition Eight Properties Near Jamaica Bus Depot, Jamaica, New York, dated February 17, 2012.
- U.S. Geological Survey, Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, Charles Baskerville, 1994. USGS I 2306.

- U.S. Geological Survey, Groundwater in Bronx, New York and Richmond Counties with Summary Data on Kings and Queens Counties, New York City, New York, Nathaniel Perlmutter and Theodore Arnow, 1953. USGS 6W-32.
- Water Supply Paper 2498 (USGS 1999) Ground-Water Resources of Kings and Queens Counties, Long Island, New York by Herbert Buxton and Peter Schernoff.
- USGS LI Depth-to Water Tool for Long Island (USGS, 2013).

13.0 APPENDICES

Appendix A - Site Location Map
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Phase I ESA - 104-32 Merrick Boulevard

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PHASE I ENVIRONMENTAL SITE ASSESSMENT
OF

104-32 MERRICK BOULEVARD
BLOCK 10164, LOT 76
JAMAICA, QUEENS, NEW YORK 11433

CONTRACT NO.: CM-1411/D-61162
TASK ORDER NO.: 24
CONSULTANT PROJECT NO.: 30-17749-0001

AUGUST 24, 2016

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1.0 EXECUTIVE SUMMARY

At the request of New York City Transit (NYCT), STV Incorporated (STV) conducted a Phase I Environmental Site Assessment (ESA) of the property located at 104-32 Merrick Boulevard, Jamaica, Queens, New York 11433 (hereafter referred to as the "Site"). The legal description of the Site is Block 10164, Lot 76. NYCT is evaluating the feasibility of acquiring the Site for the Jamaica Bus Depot reconstruction.

Block 10164, Lot 74 is an approximately 4,250 square-foot (sf) property that is a fenced vacant lot used for parking. The Site is owned by "WP Plaza, Inc." according to the Environmental Data Resources (EDR) Environmental Lien Search. Historically, the Site was occupied a paint supply company. The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

The main objective of the Phase I ESA is to identify *recognized environmental conditions (RECs)* and environmental concerns that may affect the suitability of the Site for acquisition and redevelopment. RECs are defined in ASTM International (ASTM) Standard Practice E 1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property. Note that *controlled recognized environmental conditions (CRECs)* are considered to be RECs and are listed in the Executive Summary and Conclusions of this Phase I ESA. Additionally, *vapor encroachment conditions (VECs)* were evaluated as per ASTM E 2600-10.

Other environmental issues and conditions that, in the opinion of the *environmental professional* conducting the assessment, would not be considered *RECs* are identified in this assessment. These may include *historical RECs* and/or *de minimis* conditions. The Phase I ESA also includes a preliminary evaluation of specific potential environmental issues or conditions that are, according to ASTM E 1527-13, considered non-scope considerations. These issues include radon, asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing light ballasts and caulking materials, exterior lead-based paint (LBP), chemical storage, wetlands, regulatory compliance issues, dry cleaner and other industrial emissions, mold, biological agents, electromagnetic fields, and methane. The Phase I ESA included a review of Federal, State, and local records, previous reports and historical documents; visual observation of the Site and adjoining properties; and, interviews with selected Site representatives.

The assessment requested by NYCT is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included evaluation of the following: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-site solid waste management and disposal practices; on-site hazardous materials and petroleum products management; chemical storage, ACM, PCBs and exterior LBP management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions; radon; mold and moisture intrusion; biological agents; electromagnetic fields; and, potential for methane generating materials.

Summary of RECs, CRECs, VECs and Environmental Concerns

This Phase I ESA has revealed the following RECs, CRECS, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The historic use of the Site as a paint supply company is considered a REC/VEC.

- The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that generates spent halogenated solvents is located in close proximity to the Site and is considered a REC/VEC.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- A facility with an open spill is located northwest of the Site at 165-18 South Road. This property is considered a REC/VEC based on its proximity to the Site and hydraulically cross-gradient position with respect to the Site.

- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Potential buried structures and historic fill on the property could include ACM, LBP and/or PCB-containing materials.

STV recommends performing a Phase II Environmental Site Investigation, consisting of a geophysical survey and the collection and analysis of soil and groundwater samples to determine whether the identified RECs have impacted the value of the Site or the development and use of the Site.

2.0 INTRODUCTION

This report summarizes the results of the Phase I Environmental Site Assessment (ESA) of the property located at 104-32 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 76) (hereafter referred to as the "Site"). Block 10164, Lot 76 is an approximately 4,250 square-foot (sf) property that is a fenced vacant lot used for parking. NYCT is evaluating the feasibility of acquiring the Site for the Jamaica Bus Depot reconstruction.

The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

Mr. Doane Cafferty of STV performed the Site visit on November 12, 2015. A request for access to the Site was communicated in a letter dated October 27, 2015 that was mailed to several representatives of WP Plaza, Inc. At the time this visit was conducted, STV had not yet received a response from anyone at WP Plaza Inc. Consequently, the site inspection was conducted from the public sidewalk in front of the Site. The weather was approximately 50º F with sunny skies; there were no limitations caused by the weather.

2.1 Selected Definitions

The following terms are used throughout this report and, for the purpose of clarity, corresponding definitions are provided. These terms are fully defined in ASTM E 1527-13 and ASTM E 2600-10.

Controlled Recognized Environmental Condition (CREC) – A recognized environmental condition resulting from a past *release* of *hazardous substances* or *petroleum products* that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority) with *hazardous substances* or *petroleum products* allowed to remain in place subject to the implementation of required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Historical Recognized Environmental Condition (HREC) – A past *release* of any *hazardous substances* or *petroleum products* that occurred in connection with the *property* and has been addressed to the satisfaction of the applicable regulatory authority, without subjecting the *property* to any required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Recognized Environmental Condition (REC) – The presence or likely presence of any *hazardous substances* or *petroleum products* in, on, or at a *property:* (1) due to any *release* to the *environment*; (2) under conditions indicative of a *release* to the *environment*; or, (3) under conditions that pose a *material threat* of a future *release* to the *environment*.

Environmental Professional - A person meeting the education, training, and experience requirements as set forth in 40 CFR § 312.10(b), necessary to conduct a *site reconnaissanc*e, *interview*s, and other activities in accordance with this practice, and from the information generated by such activities, having the ability to develop opinions and conclusions regarding conditions indicative of releases or threatened releases on, at, in, or to a property, sufficient to meet the objectives and performance factors in 40 CFR § 312.20(e) and (f).

Vapor Encroachment Condition (VEC) - The presence or likely presence of chemical of concern vapors in the subsurface of the target property caused by the release of vapors from contaminated soil or groundwater or both either on or near the target property.

2.2 Purpose and Scope

The purpose of this assessment is to identify RECs, CRECs, VECs, and certain other environmental issues or concerns as they existed at the Site at the time of the Site visit. The assessment is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser, or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included, but was not limited to an assessment of the following potential environmental issues: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-Site solid waste management and disposal practices; on-Site hazardous materials and petroleum products management; asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing equipment and lead-based paint (LBP) management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions, radon, mold and moisture intrusion; biological agents; electromagnetic fields; and the potential for methane generating materials.

This evaluation was conducted by qualified *environmental professionals* utilizing a standard of good commercial and customary practice in accordance with ASTM E 1527-13. The scope of work completed for this evaluation meets all requirements of ASTM E 1527-13 and includes the following:

- Documenting the physical characteristics of the Site through a review of available topographic, geologic, wetland, flood plain, groundwater data and Site observations.

- Researching the Site history through a review of reasonably ascertainable standard sources such as land deeds, fire insurance maps, city directories, aerial photographs, prior reports and interviews.

- Documenting current Site conditions, via observations and interviews, regarding the presence or absence of hazardous substances/petroleum products; the generation, treatment, storage, or disposal of hazardous, regulated, or medical wastes; the presence of electrical equipment that utilizes oils which potentially contain PCBs; and, the presence of storage tanks (above and below ground), floor drains, drains that discharge to subsurface, former septic tanks and drywells.

- Determining the usage of adjoining and nearby properties to identify the likelihood for environmental conditions (if present and/or suspected) and concerns to migrate onto the Site.

- Evaluating information contained within Federal and State environmental databases and other local environmental records, within specific search distances.

2.3 Additions, Deviations, Deletions, Data Failures, and Data Gaps

The following environmental issues that are outside the scope of (additions to) ASTM E 1527-13 were evaluated:

- A review of available radon data for the Site vicinity.
- A review of available wetlands data.

- A visual assessment for water damage and mold.
- A visual assessment for suspect ACM.
- A visual assessment for suspect LBP.
- An assessment of potential methane generation on-Site or migration to the Site.
- Regulatory compliance.
- PCB light ballasts and caulking materials.
- Biological agents (mold, pigeon guano, medical wastes, etc.).
- Air emissions from drycleaners and other industrial sources.
- An assessment of the potential presence of electromagnetic fields (EMF).
- An assessment of any dust generating activities on or near the Site.

The following deviations, data gaps and deletions from ASTM E 1527-13 were necessary in conducting this assessment:

- The Site area history was not conducted in five-year intervals. However, sufficient information about the history of the Site and surrounding area could be obtained from the available historical fire insurance maps, aerial photographs, city directories, and local records and this data gap is not likely to alter the conclusions of this report.
- The Site reconnaissance was conducted from the sidewalk area in front of the Site because access was not granted by the owner or a representative of the owner at the time of the inspection.

2.4 Limitations and Exceptions

STV has prepared this Phase I ESA using reasonable efforts in each phase of its work to identify RECs associated with hazardous substances, wastes and petroleum products at the Site. The methodology of the Phase I ESA was consistent with the ASTM E 1527-13. Findings within this report are based on information collected from observations made on the day of the Site investigation and from reasonably ascertainable information obtained from governing public agencies and private sources.

This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation, or other construction purposes. STV makes no representation or warranty that the past or current operations at the Site are or have been in compliance with all applicable Federal, State and local laws, regulations and codes.

Regardless of the findings stated in this report, STV is not responsible for consequences or conditions arising from facts that were concealed, withheld, or not fully disclosed at the time the evaluation was conducted.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The regulatory database report provided is based on an evaluation of the data collected and compiled by a contracted data research company. The report focuses on the Site and neighboring properties that could impact the Site. Neighboring properties listed in governmental environmental records are identified within specific search distances. The search distance varies depending upon the particular government record being checked. The regulatory research is designed to meet the requirements of ASTM E 1527-13. The information provided in the regulatory database report is assumed to be correct and complete.

3.0 SITE DESCRIPTION

3.1 Site Location and Legal Description

The Site is located at 104-32 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 76). Block 10164, Lot 76 is an approximately 4,250 square-foot (sf) property that that is a fenced vacant lot used for parking.

The Site is located in the Jamaica neighborhood of Queens. The Site is "E" designated according to the New York City Department of City Planning (NYCDCP) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). A map showing the location of the Site is presented in *Appendix A*. A Site Plan showing the Site's physical layout including adjacent land use is presented in *Appendix B*. Photographs of the Site and surrounding areas are included in *Appendix C*.

The Site is bound to the north by a custom wheel, tire, and rim supply and repair shop and subsequently by several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south by a one-story commercial office building followed by bus depot parking lots, a mixed-use residential/commercial building, an auto collision repair shop, and subsequently 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street. No changes to the Site were observed since the most recent Sanborn Map (2006).

The surrounding area is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR.

According to information obtained through the New York City Department of City Planning (NYCDCP) website, the Site is currently located within zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

3.2 Physical Setting

3.2.1 Topography

According to the United States Geological Survey (USGS) 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, the elevation of the Site is approximately 30 feet above mean sea level (amsl). The topography of the immediate Site area was observed to be sloping to the south-southeast. A copy of the topographic map is presented in *Appendix A*.

3.2.2 Geology

The geology of Queens County can be characterized as a wedge-shaped layer of Cretaceous and Pleistocene unconsolidated sediments, thickening to the south-southeast. Several impermeable clay layers are found within this sediment package, generally creating three distinct aquifers. Consolidated crystalline bedrock is of Precambrian age. The thickness of the unconsolidated sequence ranges from zero to approximately 1,300 feet below ground surface (bgs) from north to south. The southernmost portions of Queens, including portions of the Rockaways, consist of glaciofluvial sediments derived from melt-water of

the retreating glaciers. Depth to bedrock within the vicinity of the Site is at least 600 feet bgs (as per "Ground-Water Resources of Kings and Queens Counties, Long Island, New York, by Herbert Buxton and Peter Schernoff, dated 1999).

3.2.3 Soils

According to the GeoCheck Section of the regulatory agency database report (*Appendix I*), the soil in the area of the Site is described as Urban Land. Urban Land refers to soils that have been altered by human activities thus making them unidentifiable. Typically, these soils have been mixed with other materials, such as brick and concrete (urban fill), and characteristics can only be determined by on-site investigation. Other surficial soil types in the area of the Site consist of silt loam, loamy sand, sandy loam, and fine sandy loam. Sandy loam refers to a soil that's made of sand, silt, and clay.

3.2.4 Hydrology

Generally, groundwater contour lines mimic the surface topography and groundwater flow direction is perpendicular to these contour lines flowing from higher to lower elevation. According to USGS digital elevation data provided by Environmental Data Resources, Inc. (EDR) of Milford, Connecticut (*Appendix I*) and the USGS 7.5-minute Quadrangle map, *Jamaica, NY*, 2013, groundwater in the vicinity of the Site is inferred to flow to the south-southwest towards Jamaica Bay. According to "Water Table Altitude in Kings and Queens Counties, New York in March 1997" (USGS, 1997) depth to groundwater is anticipated to range from approximately 20 to 25 feet bgs. Estimated groundwater levels and/or flow direction(s) may vary due to seasonal fluctuations in precipitation, local usage demands, geology, underground structures, or dewatering operations. The groundwater in the vicinity of the Site is not known to be used for human consumption, as most potable water in the area is derived from upstate reservoirs managed by New York City; the Site area is serviced by the City water supply.

STV did not observe any retention ponds or other surface water bodies on the Site. The nearest surface water body is a pond in Captain Tilly Park, located approximately 4,600 feet north-northwest of the Site. Another pond, Baisley Pond, is located approximately 1.43 miles south of the Site. Bergen Basin, an inlet off Jamaica Bay, is located approximately 3.0 miles south-southwest of the Site.

STV reviewed the United States Fish and Wildlife Service National Wetlands Inventory (NWI) map for the area of the Site (http://www.fws.gov/wetlands/data/index.html) to determine if the Site is located in a regulated wetlands area. Based on a review of the map, the Site is not located within a regulated wetlands area. A copy of the wetlands map is included in *Appendix D*.

The Federal Emergency Management Agency (FEMA) Region II Coastal Analysis and Mapping Preliminary Flood Maps & Data website (http://www.region2coastal.com/view-flood-maps-data/view-preliminary-flood-map-data/) was reviewed to assess whether the Site is located within a designated flood plain or flood zone. According to the revised preliminary FIRM Panel 3604970233G (effective date January 30, 2015), the Site is not located within a 100-year flood zone; therefore, this does not represent an environmental concern for the Site. A copy of the flood insurance map for the Site area is included in *Appendix E*.

Stormwater is collected from catch basins located on paved areas of the Site and the surrounding streets and is conveyed into the NYCDEP combined storm/sanitary sewer system.

3.2.5 Radon

Radon is a colorless, odorless radioactive gas that results from the natural breakdown of uranium minerals in soil, rock, and water, which subsequently enters the atmosphere. It can concentrate in buildings, entering through cracks and other penetrations of a building foundation. Some areas are more likely to have elevated concentrations of radon than others, reflecting subsurface lithologic conditions.

The New York State Department of Health (NYSDOH) maintains a database of radon test results on a local and county level. According to the NYSDOH, 527 radon tests have been conducted in basements in Queens County. The average radon level was found to be 1.20 picoCuries per liter (pCi/L). According to Federal Area Radon Information presented in the EDR report (*Appendix I*), radon concentrations were tested at 81 locations in Queens County. The average radon concentration in Queens County, New York was 0.620 pCi/L in living areas tested and 0.970 pCi/L in basements tested. In addition, Queens County is in United States Environmental Protection Agency (USEPA) Radon Zone 3, where the indoor average radon level is less than 2 pCi/L. These results are below the USEPA Action Level of 4.0 pCi/L; therefore, STV concludes that it is unlikely that elevated levels of radon gas are present at the Site.

4.0 ADJOINING AND SURROUNDING PROPERTIES

The area surrounding the Site is primarily characterized low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR. The following table summarizes the adjoining site uses:

Direction	Facility Name/Description	Street Address/Location	Current Use
North	Industrial/ Manufacturing	104-28 Merrick Blvd. 104-22 Merrick Blvd. 104-12 Merrick Blvd. 104-10 Merrick Blvd. 104-02 Merrick Blvd.	RVM Wheels Vacant Manufacturing Facility Vacant Manufacturing Facility Vacant Manufacturing Facility Vacant Manufacturing Facility
East	Merrick Blvd. followed by Transportation/Utility and Parking and Retail Gasoline Sales	Merrick Blvd. 104-15 Merrick Blvd. 104-19 Merrick Blvd. 105-09 Merrick Blvd. 105-15 Merrick Blvd.	Public Street Sports Line Auto Repairs Auto repair facility (parking) Inter City Tire (truck tire center) BP Gas Station
South	Commercial Office, Parking, Mixed-Use Res/Commercial, and Transportation /Utility followed by 107th Avenue	105-02 Merrick Blvd. 105-12 Merrick Blvd. 105-14 Merrick Blvd. 105-22 Merrick Blvd. 106-04 Merrick Blvd. 107th Avenue	Domino's Pizza/Appliance Repair Parking Lot Parking Lot Deli (closed) and Residences First World Auto/Calvin Auto Body Public Street
West	Transportation/Utility	165-18 South Road	Jamaica Bus Depot

Based on our inspection of the adjacent and surrounding properties, the following off-site REC/VEC was identified:

- Several auto repair facilities are located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- One (1) active gasoline filling station is located in the area surrounding the Site. This property is considered a REC/VEC based on its proximity to the Site.

5.0 HISTORICAL USE RESEARCH

5.1 Land Title Records and Tax Records

STV researched prior ownership information for the Site at the New York City Department of Finance (DOF) website. In addition, prior ownership information was researched through EDR's Environmental Lien Search and the New York City Department of Buildings (NYCDOB) Automated City Register Information System (ACRIS) on-line website. The subject property is currently owned by "WP Plaza, Inc". Based on the research, this entity has owned the Site since at least 2013. No environmental liens were identified for the Site. All prior ownership information reviewed is presented in *Appendix J*.

5.2 Historical USGS Topographic Quadrangles

STV reviewed available historical USGS Topographic Quadrangles for information regarding past uses of the Site and surrounding area. Topographic maps for the Brooklyn quadrangle were obtained for the following years: 1900 and 1924. Topographic maps for the Jamaica quadrangle were obtained for the following years: 1947, 1957, 1966, 1979, and 1994. The following table presents descriptions and interpretations from historical USGS topographic map review.

Year (Scale and Quadrangle)	Comments
1900 (1:62,500) Brooklyn	**Site:** The Site appears to be located amongst developed streets. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** Surrounding properties appear to be located amongst developed streets. The Long Island Railroad (LIRR) tracks are depicted to the north of the Site. A pond is depicted west-southwest of the Site on the south side of the LIRR tracks. The area a few blocks south of the Site appears as undeveloped land with only a few roadways present, rail lines, and a pond and wetlands area. Due to scale of the map, no further information can be obtained.
1924 (1:62,500) Brooklyn	**Site:** No significant changes are apparent to the Site property from the 1900 topographic map. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** No significant changes are apparent to the Site property from the 1900 topographic map. Due to scale of the map, no further information can be obtained.
1947 (1:25,000) Jamaica	**Site:** The Site appears as a vacant lot. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** The areas north, east, south, and west of the Site have been significantly developed with streets and structures. A long building is depicted northwest of the Site on the same block. Prospect Cemetery is identified west of the Site on the south side of the LIRR tracks where a pond was previously depicted. The Jamaica Station is located west-northwest of the Site. Water Supply Company Tank No. 2 is located east of the Site. Baisleys Pond is depicted several blocks south of the Site. The Contagious Disease Hospital and Queens General Hospital are located northwest of the Site on the south side of Union Turnpike.
1957 (1:24,000) Jamaica	**Site:** Elevation contour lines are depicted on the map and show the Site is approximately 30 feet amsl. No other significant changes are apparent to the Site property from the 1947 topographic map. **Surrounding Properties:** An Armory is identified several blocks north of the Site on the north side of the LIRR tracks. Water pumping stations are located east and south of the Site. A water tower is depicted west of Site in the immediate vicinity of Prospect Cemetery. The LIRR Hillside Support Facility is depicted to the east of the Site. St. Albans Naval Hospital is located southeast of the Site. No other significant changes are apparent to the surrounding properties from the 1947 topographic map.

Year (Scale and Quadrangle)	Comments
1966 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1957 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1957 topographic map.
1979 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1966 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1966 topographic map except the water tower that was west of Site near Prospect Cemetery is no longer depicted.
1994 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1979 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1979 topographic map.

Based on STV's review of historical topographic maps, the Site appears to be amongst developed streets as early as 1900. No evidence of filling was noted on the Site property. The Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site. The review of historical USGS Topographic Quadrangles did not indicate RECs, CRECs, HRECs, or VECs at the Site or surrounding areas. Copies of historical USGS Topographic Maps are included in *Appendix F*.

5.3 Historical Aerial Photographs

STV reviewed historical aerial photographs of the Site and surrounding areas provided by EDR in order to identify historical land use that may have involved hazardous substances and petroleum products. Aerial photographs were obtained for the following years: 1924, 1951, 1954, 1961, 1966, 1975, 1984, 1994, 2006, 2009, and 2011. The following table summarizes descriptions and interpretations from the historical aerial photograph reviews:

Year	Comments
1924 1" – 500'	**Site:** The Site appears to be vacant land. Due to the scale of the photograph, no further details can be discerned. **Surrounding Properties:** The areas adjacent to the Site to the east and south appear to be developed with multiple structures. The area north of the Site appears to be developed with a structure. A long building is visible northwest of the Site on the same block. Railroad tracks are depicted to the north. Due to scale of the photograph, no further details can be discerned.
1951 1" – 500'	**Site:** The Site appears to be vacant land. Due to the scale of the photograph, no further details can be discerned. No other significant changes are discernible on the Site from the 1924 aerial photograph. **Surrounding Properties:** The areas adjacent to the Site to the east and south appear to be developed with multiple structures. The area north of the Site appears to be developed with a structure. A long building is visible directly northwest of the Site on the same block. Railroad tracks are depicted to the north. A large water tank is located south of the Site. Due to scale of the photograph, no further details can be discerned. No other significant changes are discernible to the adjacent and surrounding properties from the 1924 aerial photograph.
1954 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1951 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1951 aerial photograph.

Year	Comments
1961 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1954 aerial photograph. **Surrounding Properties:** A vacant lot and/or parking lot north of the Site appears to be developed with a structure. Some of the structures south of the Site on the same block are gone and the area appears to be used as storage for truck trailers or cargo containers. Two water tanks are located south of the Site. No other significant changes are discernible to the adjacent and surrounding properties from the 1954 aerial photograph.
1966 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1961 aerial photograph. **Surrounding Properties:** More the structures south of the Site on the same block are gone and the area appears to be used as storage for truck trailers or cargo containers. No other significant changes are discernible to the adjacent and surrounding properties from the 1961 aerial photograph.
1975 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1966 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1966 aerial photograph.
1984 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1975 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1975 aerial photograph.
1994 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1975 aerial photograph. The image is of poor quality. **Surrounding Properties:** The structures on the block south of the Site's block are gone and the area appears to be vacant. No other significant changes are discernible to the adjacent and surrounding properties from the 1975 aerial photograph. The image is of poor quality.
2006 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1994 aerial photograph. **Surrounding Properties:** A large building complex has been constructed on the block south of the Site's block. No other significant changes are discernible to the adjacent and surrounding properties from the 1994 aerial photograph.
2009 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2006 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2006 aerial photograph.
2011 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2009 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2009 aerial photograph.

The review of historical aerial photographs did not indicate RECs, CRECs, HRECs, or VECs at the Site or surrounding areas. Copies of reproducible historical aerial photographs are included in *Appendix G*.

5.4 Historical Fire Insurance Maps (Sanborn® Maps)

A search for historical fire insurance maps for the Site and adjoining properties was conducted by EDR. These maps were obtained for the following years: 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006. The following table presents descriptions and interpretations from historical fire insurance map review.

Year	Comments
1901	**Site:** The Site is depicted as vacant land. **Surrounding Properties:** Surrounding properties include residential dwellings, sheds, a hotel, a polling place, a **blacksmith,** and a **sign painting shop**. A large tract of vacant land is located immediately west of the Site.

Year	Comments
1912	**Site:** The Site is depicted with a residential dwelling. No other significant changes have occurred to the Site from the 1901 map. **Surrounding Properties:** Several more residential dwellings have been developed in the areas north, east, south, and west of the Site. The **sign painting shop** is no longer depicted to the north-northeast of the Site across Merrick Blvd. No other significant changes have occurred to the adjacent and surrounding properties from the 1901 map.
1926	**Site:** The residential dwelling is gone and Site is depicted with a commercial structure fronting Merrick Blvd. and a portion of residential dwelling located towards the western property boundary. No other significant changes have occurred to the Site from the 1912 map. **Surrounding Properties:** Several residential dwellings have been developed on the blocks northeast and west of the Site. An **auto painting facility** is located to the north-northeast of the Site across Merrick Blvd. and a **sign painting shop** is located to the north of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1912 map.
1951	**Site:** The portion of the residential dwelling located towards the western property boundary is gone and the area is now developed with three contiguous sheds. The commercial structure is labeled '**paints**'. No other significant changes have occurred to the Site from the 1926 map. **Surrounding Properties:** Two **iron works**, two **auto repair facilities**, a **lacquer paint shop**, and two **gasoline filling stations** are located to the north of the Site on the same block. An **auto body repair shop** and a **gasoline filling station** are located to the east of the Site across Merrick Blvd. A **gasoline filling station**, **carpet cleaner**, and **auto repair and paint shop** are located to the south of the Site. The New York City Transit System Service Station and Garage is located to the west of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1926 map.
1981	**Site:** No significant changes have occurred to the Site from the 1951 map. **Surrounding Properties:** The structure immediately north of the Site is now labeled '**auto parts mfg**'. A building labeled '**salvage depot**' is located to the north of the Site. A **print shop** and two **auto repair facilities** are located east of the Site. A **truck repair sh**op is located to the southeast of the Site. The two **gasoline filling stations** to the north of the Site and the **gasoline filling station** south of the Site are no longer depicted. The residential dwellings and other structures located at the southern end of the Site block are gone and the area is labeled 'bus parking'. No other significant changes have occurred to the adjacent and surrounding properties from the 1951 map.
1982	**Site:** No significant changes have occurred to the Site from the 1981 map. **Surrounding Properties:** The **carpet cleaner** located to the south of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1981 map.
1986	**Site:** No significant changes have occurred to the Site from the 1982 map. **Surrounding Properties**: A **junk yard** is depicted to the east of the Site along 106th Avenue. No other significant changes have occurred to the adjacent and surrounding properties from the 1982 map.
1988-1993	**Site:** No significant changes have occurred to the Site from the 1986 map. **Surrounding Properties**: The **junk yard** is no longer depicted beginning in 1991. An **auto repair facility** is depicted at the southeast corner of Merrick Blvd. and 104th Avenue beginning in 1993. No other significant changes have occurred to the adjacent and surrounding properties from the 1986 map.
1995	**Site:** No significant changes have occurred to the Site from the 1993 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1993 map.
1996	**Site:** No significant changes have occurred to the Site from the 1995 map. **Surrounding Properties:** An **auto repair and wash facility** is depicted to the north of the Site on the same block. No significant changes have occurred to the adjacent and surrounding properties from the 1995 map.

Year	Comments
1999	**Site:** The commercial structure fronting Merrick Blvd. and two of the sheds on the Site are gone. One shed is depicted on the western property boundary. No other significant changes have occurred to the Site from the 1996 map. **Surrounding Properties:** The **gasoline filling station** located to the east of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1996 map.
2001-2006	**Site:** No significant changes have occurred to the Site from the 1999 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1999 map.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the Site:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The historic use of the Site as a paint supply company is considered a REC/VEC.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the surrounding areas:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Several current auto repair facilities and one retail gasoline filling station were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

Copies of the historical fire insurance maps are provided in *Appendix H*.

5.5 City Directories

A review of historical city directories for the Site and surrounding areas was conducted by EDR. The following table presents descriptions and interpretations from the historical city directory reviews.

Year	Comments
1922	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1934	**Site:** The Site address was listed for residential listings. **Surrounding Properties:** Surrounding properties included residential listings and a bakery.
1939	**Site:** The Site address was listed for **H&P Paint Supply Co**. **Surrounding Properties:** Surrounding properties included residential listings, a **junk yard**, **auto repairs**, an **auto painting shop**, a **gasoline filling station,** and the Dry Steam Appliance Co.
1945	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, an auto parts store, a **home heating oil service**, and a **gasoline filling station**.

Year	Comments
1950	**Site:** The Site address was listed for a **paint supply company**. **Surrounding Properties:** Surrounding properties included residential listings, offices, liquor store, a garage, a grocery, a tavern, a tool and die company, a **printing company**, an **iron works**, a **home heating oil service**, a **gasoline filling station**, and a nursing home.
1962	**Site:** The Site address was listed for a **paint supply company**. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and an electronics corporation.
1967	**Site:** The Site address was listed for a **paint supply company**. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and a **gasoline filling station**.
1970	**Site:** The Site address was listed for a **paint supply company**. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1976	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1983	**Site:** The Site address was listed for Ebony International Sales Export Co. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1991	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings**, auto body shops,** and Rocket Sewer Service.
1996	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
2000	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a **printing company**, **auto body shops**, and a daycare facility.
2005	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a **printing company**, **auto body shops**, an auto wrecking facility, a furniture store.
2008	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and a storage facility.
2013	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, the **Hadco Metal Trading Co**., **auto body shops**, a medical office, a **printing company**, restaurants, and Caribbean Heating Corp.

The review of the historical city directories revealed the presence of the following RECs and VECs at the Site:

- The historic use of the Site as a paint supply company is considered a REC/VEC.

The review of historical city directories revealed the presence of the following RECs and VECs at the surrounding areas:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

Copies of the historical city directories are provided in *Appendix J.*

5.6 Prior Reports

STV reviewed a *Phase I ESA for Eight Properties Near Jamaica Bus Depot*, dated February 17, 2012. The report was prepared by STV on behalf of MTA NYCT. The properties are located in the Borough of Queens, New York, including Lots 41, 53, 60, 61, 63, 66, 68, and 72 within Block 10164. The Phase I ESA identified RECs in connection with the properties addressed as 103-16 Merrick Boulevard and 103-30 Merrick Boulevard. These properties historically including an auto repair shop and filling stations with gasoline storage tanks. Additionally, an existing product plume at the Site and adjacent properties is considered a REC. Finally, based on open spills, undocumented tightness testing and known subsurface contamination, the Jamaica Bus Depot and BP Service Station #11009 represent RECs. The Phase I ESA revealed environmental concerns associated with the Site including suspect ACM, LBP on interior and exterior painted surfaces, suspect PCBs, and water staining and mold growth.

The report concluded that NYCT has performed extensive soil and groundwater investigations, including post-remediation sampling, at the Jamaica Bus Depot from approximately 2002 to the present. Based on the ongoing environmental monitoring being administered under NYSDEC Global Consent Order, active pump and treat remediation system, and numerous sub-surface environmental investigations that have been performed at the Jamaica Bus Depot, a Phase II Environmental Site Investigation (ESI) was not required. Based on the review of this existing information, recommendations were provided for engineering controls to be implemented during future site development. At a minimum, the following remedial actions and/or engineering controls are required to render the Site suitable for use:

1. Prior to any site redevelopment, a geophysical survey should be performed to determine if any underground storage tanks (USTs) are present at 103-16 Merrick Boulevard, 103-30 Merrick Boulevard and any other potential excavation locations. Additionally, in the event that a UST is discovered, an evaluation should be made at that time of the need for any additional investigation to determine whether soil and/or groundwater has been adversely impacted more than is currently documented.
2. As a safeguard to prevent potential volatile organic compounds in soil vapor from entering the new building in the future, a soil vapor barrier should be integrated into the new building design.
3. All material excavated during construction activities should be properly characterized and disposed, including collection and analysis of additional samples if required by the contractor-selected disposal facilities.
4. After the proposed new building and grounds are constructed, any exposed soil (landscaped areas) must be covered with at least two feet of environmentally clean fill.
5. Suspect ACM, LBP, PCB-containing materials and/or mold encountered during construction or excavation should be properly identified and managed.

5.7 Other Historical Sources

In 2012, STV was provided with several previous environmental reports pertaining to the area adjacent to the Site - the NYCT Jamaica Depot located at 165-18 South Road, Jamaica, Queens, NY. URS Corporation (URS) is currently providing environmental engineering services for the Jamaica Bus Depot in conjunction with NYCT's UST program. The work is being administered under NYSDEC Global Consent Order CO2-20000101-3341 dated May 2001. NYCT has been operating a pump and treat remediation system to recover a combined heating oil and diesel fuel release since 1995 at the Jamaica Bus Depot. NYSDEC spill #9010039 was initially reported on December 14, 1990 and continues to be an open case, along with several other spills that occurred consequently. Numerous investigations have

been performed at the Jamaica Bus Depot by URS to evaluate the extent of product in the sub-surface and all possible in-situ remedial measures to address petroleum-impacted soil and groundwater. These are as follows:

- Soil Investigation Report, October 2002. This investigation consisted of the advancement of five soil borings within the plume and collecting soil samples to determine the presence and vertical extent of petroleum-impacted soil beneath the water table. This study was prompted by NYCDEP's intention to re-activate the Jamaica Water Supply wells for regional dewatering in 2007 which could lower the water table by as much as 16 feet. The study concluded that product releases likely occurred when the water table was depressed during the previous operation of the Jamaica water supply system (pre-1996). However, soil impacts when compared with cleanup objectives were insignificant.
- Site-Specific Investigation Work Plan (SSIWP), May 2004. A soil and groundwater investigation was conducted in 2003 to determine the levels to which product had impacted soils relative to NYSDEC TAGM soil cleanup objectives, the results of which were reported in this SSIWP. Six borings were advanced with soil samples and groundwater samples were collected from nearby wells. The results imply that free product and the associated petroleum contaminants detected in soils were not significantly impacting dissolved-phase groundwater quality. The SSWIP also discussed the feasibility of bioremediation at the Jamaica Depot.
- Feasibility of Enhanced Product Recovery through Site-Wide Groundwater Depression, May 2004. This feasibility study (FS) was prompted by NYSDEC correspondence to URS dated April 29, 2004 that suggested that the product recovery system be enhanced or redesigned to increase product recovery through a significant increase in the pumping rate to overcome the rise in groundwater levels. The FS consists of dewatering calculations to determine the capacity of a remediation system capable of lowering the water table in the depot area by five feet. The pumping rate was estimated on the higher end of the range from 400 to 4,000 gpm, based on operating data from the existing system. The FS also stated that the product plume was currently trapped beneath the water table but was stable and not migrating.
- Site-Specific Remedial Plan (SSRP) for In-Situ Bioremediation Investigation, October 2004. In-situ enhanced bioremediation was recommended as the only feasible technology for soil remediation, considering the site constraints. Implementation would be done through the injection of a slurry of oxygen-releasing material in the subsurface. An investigation was performed in June 2004 to support this recommendation and thus acquire site-specific information pertaining to existing microbiologic conditions within and outside of the historic limits of the free product plume. Two borings were advanced (GP-7 and GP-8) near existing monitoring wells (W-10 and W-25) and samples were collected for both, respectively.
- Site-Specific Remedial Plan and Remedial Design (SSRP/RD) for Enhancing Product Recovery, March 2005. The SSRP/RD was designed to address the fact that effective in-situ technologies to treat trapped product are limited. At a meeting with NYSDEC and NYCT on February 25, 2005, one potential approach was identified utilizing the full capacity of a single extraction well for recovery in of product in that area. The SSRP/RD was approved in a letter dated May 5, 2005 by the NYSDEC for the use of one well (PW-4) to pump 170 gallons per minute (gpm) in order to lower the water table by four feet in an area extending 20-25 feet from the extraction point. If the design is successful, it will be utilized at a later date to address the rest of the plume.
- Remediation Analytical Data, 2008-2011. Groundwater quality is being monitored during remediation at the Jamaica Depot, as well as groundwater and product levels.

5.8 Historical Use Interviews

No other historical sources were available for interview.

6.0 REGULATORY AGENCY RECORD REVIEWS

The databases discussed in this section, provided by EDR, were reviewed for information regarding documented and/or suspected releases of regulated hazardous substances and/or petroleum products on or near the Site (*Appendix I*). STV also reviewed the "unmappable" (also referred to as "orphan") listings within the database report, cross-referencing available address information and facility names. Unmappable sites are listings that cannot be plotted with confidence, but are identified as being located within the general area of the Site based on the partial street address, city name, or zip code. In general, a listing cannot be mapped due to inaccurate or incomplete address information in the database that was supplied by the corresponding regulatory agency. Any listings from the unmappable summary which were identified by STV as a result of the area reconnaissance and/or cross-referencing to mapped listings are included in the corresponding database discussion within this section.

6.1 Federal and State Regulatory Agency Database Reviews

A review of federal and state records for the Site was accomplished by contacting offices of Federal and State regulatory agencies and review of the regulatory listings compiled in the regulatory agency database report (*Appendix I*). The results of the review of the Federal and State records are presented below. Copies of the correspondences are included in *Appendix K*.

United States Environmental Protection Agency (USEPA)
The USEPA is responsible for protecting human health and the environment. To that end, the USEPA develops and enforces regulations that implement environmental laws enacted by Congress. A Freedom of Information Law (FOIL) request dated October 1, 2015 was filed with the USEPA to determine if the agency holds additional records pertaining to the Site property. USEPA acknowledged the request on October 1, 2015. At the time this report was issued, STV had not yet received any further responses from USEPA. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

The status of the Site was also checked on USEPA's MyPropertyInfo website on September 30, 2015. A search of the databases did not locate any environmental records. A copy of the MyPropertyInfo result is included in *Appendix K*.

New York State Department of Environmental Conservation (NYSDEC)
The NYSDEC maintains files of incidents involving environmentally regulated materials, spill incidents, and state regulated cleanups. The records maintained by NYSDEC include reports of spills of hazardous chemicals and petroleum, petroleum bulk storage information, and site-specific environmental data. NYSDEC information concerning the Site property was requested in a FOIL records access application dated October 1, 2015. NYSDEC acknowledged the request on October 2, 2015. NYSDEC sent a response email dated October 13, 2015, indicating that no records have been located for the Site.

New York State Department of Health (NYSDOH)
The NYSDOH Records Access Office maintains files of health-related environmental incidents in the State of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYSDOH information concerning the Site property was requested in a formal letter dated September 30, 2015. NYSDOH acknowledged the request on September 30, 2015. NYSDOH sent a response letter dated October 23, 2015, indicating that no records have been located for the Site.

A summary of sites identified through the Federal and State regulatory agency database review is provided in the following table:

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
National Priorities List for Federal Superfund Cleanup (NPL)	03/26/2015	1 mile	0	No	No
Delisted NPL Site List	03/26/2015	1 mile	0	No	No
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), including CERCLIS NFRAP Sites	10/25/2013	½ mile	0/0	No	No
Resource Conservation and Recovery Information System – Corrective Action Activity (RCRIS CORRACTS) and Non-CORRACTS Treatment, Storage, or Disposal Facilities (RCRIS-TSD)	06/09/2015	1 mile / ½ mile	0/0	No	No
Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)	06/09/2015	¼ mile	1/1/3	No	**Yes**
RCRA Non-Generator	06/09/2015	¼ mile	14	No	**Yes**
Federal Institutional Control/Engineering Control Registries	06/09/2015	½ mile	0/0	No	No
Emergency Response Notification System (ERNS)	06/22/2015	Site	NA[1]	No	No
State Toxic Release Inventory System (TRIS)	12/31/2013	¼ mile	0	No	No
Hazardous Substance Waste Disposal Site Inventory (HSWDS)	01/01/2003	½ mile	0	No	No
New York State Inactive Hazardous Waste Disposal Sites (SHWS)	08/17/2015	1 mile	3	No	No
Solid Waste Management Facilities Sites (SWF/LF)	06/24/2015	½ mile	13	No	**Yes**
Vapor Reopened	11/01/2014	1 mile	1	No	No
New York State Spills Information (NY Spills)/Leaking Underground Storage Tanks (LTANKS)	08/17/2015	½ mile 1/8 mile	18/31	No	**Yes**
Petroleum Bulk Storage Tanks (USTs/ASTs)	07/29/2015	¼ mile	6/11	No	**Yes**
NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)	01/01/2002	¼ mile	0/1	No	**Yes**
NY Chemical Bulk Storage Tanks (NY CBS)	07/29/2015	¼ mile	2	No	**Yes**
Historic Bulk Storage Tanks (USTs/ASTs)	01/01/2002	¼ mile / Site	1/0	No	**Yes**
New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)	08/17/2015	1 mile	0/1	No	No
E-Designation Site (E)	05/27/2015	1/8 mile	30	**Yes**	**Yes**

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
Registered Dry Cleaners	07/02/2015	½ mile	0	No	No
EDR US Hist Auto Stat	NA	¼ mile	39	No	**Yes**
EDR US Hist Cleaners	NA	½ mile	1	No	**Yes**
NY Manifest	08/01/2015	¼ mile	19	No	**Yes**
NJ Manifest	12/31/2013	¼ mile	4	No	**Yes**
RI Manifest	12/31/2013	¼ mile	1	No	**Yes**
Manufactured Gas Plant Sites (Coal Gas)	NA[2]	1 mile	1	No	No

* The surrounding area search radius indicates the radial area (measured from the perimeter of the Site) for which the database review was performed.
[1]NA – Not Applicable
[2] This database consists of a compilation of historic resources (as early as the late 1800s) prepared by EDR that does not require updates. The last MGP in New York State ceased operations in 1972.

The Site is listed in the E-Designation database. The following subsections provide a discussion of the listings that have been identified within the search radii and are in the table above:

National Priorities List of Federal Superfund Cleanup (NPL)
The NPL is a subset of the CERCLIS, and lists properties that are ranked as high priority for cleanup under the federal Superfund program. Neither the Site nor any other facility within one mile of the Site is listed in the NPL Site List.

Delisted NPL Site List
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the USEPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425 (e), sites where no further response is appropriate may be deleted from the NPL. Neither the Site nor any other facility within one mile of the Site is listed in the Delisted NPL Site List.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
The CERCLIS list is a compilation of known and suspected uncontrolled or abandoned hazardous waste sites which are, or were, under investigation by USEPA but have not been elevated to the status of a Superfund (NPL) site. Former CERCLIS sites that have been granted the status of No Further Remedial Action Planned (NFRAP) are also included in the database. Neither the Site nor any other facility within one-half mile of the Site is listed in the CERCLIS or CERCLIs NFRAP databases.

Resource Conservation and Recovery Information System (RCRIS) – Treatment, Storage, or Disposal Facilities (TSD) and RCRIS Corrective Action Activity (CORRACTS)
The RCRA program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRIS database tracks facilities that treat, store, and/or dispose of hazardous waste as defined by RCRA (referred to as TSD facilities). The RCRIS CORRACTS database identifies TSD facilities that have conducted, or are currently conducting, corrective action(s) as regulated under RCRA.

Neither the Site nor any other facility within one mile of the Site is listed in the RCRIS CORRACTS database and neither the Site nor any other facility within one-half mile of the Site is listed in the RCRIS-TSD database.

Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)
This list includes operations that generate or transport hazardous waste for which a hazardous waste generator identification number or transporter permit is required. The RCRIS Gen/Trans listing is merely a listing of all facilities that, due to the amount of hazardous waste generated, are required to register with the USEPA for tracking purposes, but are not necessarily those with reported contamination incidents. The Site was not listed in the RCRIS Gen/Trans database.

One (1) RCRA Large Quantity Generator (RCRA-LQG) was listed within a one-quarter mile radius of the Site. Based on its distance from the Site and lack of reported violations, this RCRA-LQG listing is not anticipated to have affected the environmental integrity of the Site.

One (1) RCRA Small Quantity Generator (RCRA-SQG) was listed within a one-quarter mile radius of the Site. The following RCRA-SQG facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
R&S Parts & Service Inc. dba Strauss Auto 168-08 Liberty Avenue Jamaica, NY 11433	731-ft/North	Up-gradient	I84	EPA ID: NYD980758080. The Site is also listed on the NY Manifest database. Facility generates spent halogenated solvents.

Three (3) RCRA Conditionally Exempt Small Quantity Generators (RCRA-CESQG) were listed within a one-quarter mile radius of the Site. The following RCRA-CESQG facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCTA 165-18 South Road Jamaica, NY 11433	584-ft/Northwest	Cross-gradient	F70	EPA ID: NYD980642268. The Site is also listed on the US AIRS, NJ Manifest, and RI Manifest databases. Facility generates cadmium, lead, and waste oils and has listed violations associated with its operations.

Based on their distance from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow direction, the other RCRA-CESQG listings are not anticipated to have affected the environmental integrity of the Site.

Resource Conservation and Recovery Information System Non-Generators / No Longer Reporting (RCRA NonGen / NLR)
RCRAInfo is USEPA's comprehensive information system, providing access to data supporting the RCRA of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the RCRA. Non-Generators do not presently generate hazardous waste. The Site is not listed in the RCRA NonGen / NLR database.

Fourteen (14) RCRA NonGen / NLR facilities were identified within a one-quarter mile radius of the Site. The following RCRA NonGen / NLR facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	378-ft/East-southeast	Cross-gradient	D39	EPA ID: NYD987030012. The Site is also listed on the NY Manifest database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	753-ft/Northwest	Up-gradient	I74	EPA ID: NYD986903763. The Site is also listed on the NY Manifest database. The facility is a retail gasoline filling station.
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	218-ft/East-southeast	Down-gradient	A18	EPA ID: NYD981874407. The Site is also listed on the NY Manifest database.

None of the other RCRA Non/Gen /NLR listings are anticipated to have affected the environmental integrity of the Site, based on their distances from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow directions.

Federal Institutional Control/Engineering Control Registries

The Federal Institutional Control/Engineering Control Registries are listings of sites with engineering controls and/or institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining at a site. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or affect human health. Neither the Site nor any other facility within one-half mile of the Site is listed in the Federal Institutional Control/Engineering Control Registries.

Emergency Response Notification System (ERNS)

The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances. The Site is not listed in the ERNS database.

New York State Toxic Release Inventory System (TRIS)

The Toxic Release Inventory System (TRIS) is a database used to collect information and report releases of toxic chemicals to the air, water, and land in reportable quantities. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the TRIS database.

Hazardous Substance Waste Disposal Site Inventory (HSWDS)

The list includes any known or suspected hazardous substance waste disposal sites. Also included are sites delisted from the Registry of Inactive Hazardous Waste Disposal Sites and non-Registry sites that

USEPA Preliminary Assessment (PA) reports or Site Investigation (SI) reports were prepared. Hazardous Substance Waste Disposal Sites are eligible to be Superfund sites. The sites on the list will not automatically be made Superfund sites; rather each site will be further evaluated for listing on the Registry. Neither the Site nor any other facility within one-half mile of the Site is listed in the HSWDS database.

New York State Inactive Hazardous Waste Disposal Sites (SHWS)
The New York State Inactive Hazardous Waste Disposal Sites database, compiled by the NYSDEC, maintains information regarding the investigation and cleanup of suspected hazardous waste sites. The Site is not listed in the SHWS database.

Three (3) SHWS facilities were listed within a one-mile radius of the Site. Based on their distances from the Site (greater than one-quarter mile) and/or inferred down-gradient groundwater flow direction, these SHWS facilities are not anticipated to have affected the environmental integrity of the Site.

Solid Waste Management Facilities Sites (SWF/LF)
The SWF/LF database is a comprehensive listing of State permitted/recorded solid waste management facilities. The Site is not listed in the SWMF database.

Thirteen (13) SWF/LF facilities were listed within a one-half mile radius of the Site. The following SWF/LF facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Taylor Auto Collision 104-21 Merrick Blvd. Jamaica, NY 11433	255-ft/North-northwest	Up-gradient	B22	The Site was engaged in vehicle dismantling. The Site is inactive.
Junk Yard International 169-09 Liberty Avenue Jamaica, NY 11433	903-ft/North	Up-gradient	L102	The Site was engaged in vehicle dismantling. The Site is inactive.
S&S Super Sports Auto Care Inc. 94-40 Merrick Blvd. Jamaica, NY 11433	1,022-ft/North-northwest	Up-gradient	M112	The Site was engaged in vehicle dismantling. The Site is inactive.

Based on their distances from the Site and/or inferred down-gradient groundwater flow direction, the other SWF/LF facilities are not anticipated to have affected the environmental integrity of the Site.

Vapor Reopened

New York is currently re-evaluating previous assumptions and decisions regarding the potential for soil vapor intrusion exposures at sites. As a result, all past, current, and future contaminated sites will be evaluated to determine whether these sites have the potential for exposures related to soil vapor intrusion. The Site is not listed in the Vapor Reopened database.

One Vapor Reopened facility was listed within a one-mile radius of the Site. The facility is identified as West Side Corp., and is located 3,422-ft east of the Site at 107-10 180th Street. This facility is also listed in the NY UST and Historical UST databases. The site contains soil vapor and contaminated groundwater above guidance values. Based on its distance from the Site and/or inferred down-gradient

groundwater flow direction, this Vapor Reopened listing is not anticipated to have affected the environmental integrity of the Site.

New York State Spills Information Database (NY Spills)/Leaking Underground Storage Tanks (LTANKS)
The NY Spills database, including LTANKS sites, was researched to identify listings within one-half mile of the Site. The database search identified 18 reported NY Spills and 31 LTANKS incidents within one-half mile of the Site. The Site is not listed in the NY Spills/LTANKs databases.

The following NY Spills / LTANKS facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	584-ft/Northwest	Cross-gradient	F74	Spill No. 9010039 was reported on 12/14/90. The spill was the result of a tank test failure. The spill is not closed. There are known petroleum-impacted soils and groundwater. NYCT has been operating a pump and treat system since 1995.

Based on distance from the Site combined with the assumed hydraulic relationship and/or the nature of the incident/regulatory status, none of the other facilities located within one-half mile of the Site identified in the NY Spills/LTANKS databases are expected to impact the environmental integrity of the Site.

Petroleum Bulk Storage Tanks (USTs/ASTs)
The NYSDEC PBS tank database was researched to identify listings for the Site and adjacent properties. The PBS Tank database is a listing of all facilities that are required to register their storage tanks for tracking purposes and not necessarily those with reported contamination incidents. The Site is not listed in the PBS tank database.

A total of 17 facilities (6 UST sites and 11 AST sites) were identified within one-quarter mile from the Site. The following UST facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BHELA 105-15 Merrick Blvd. Jamaica, NY 11433	93-ft/East-northeast	Up-gradient	A15	PBS No. 2-601509. The Site is an active retail gasoline filling station. The site has three (3) 4,000-gallon gasoline USTs and one (1) 4,000-gallon diesel UST. The Site is also listed on the NY AST database.
Jamaica Bus Depot - NYCT 165-18 South Road	584-ft/Northwest	Cross-gradient	F73	PBS No. 2-190225. The site has five (5) 4,000-

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica, NY 11433				gallon diesel USTs and five (5) 4,000-gallon biodiesel UST. There are two (2) 15,000-gallon #6 fuel oil USTs and twelve (12) 2,000-gallon diesel USTs that are closed-in-place. There are two (2) 15,000-gallon #2 fuel oil USTs that are temporarily out-of-service. The site has a history of spills with one open spill case.
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	753-ft/Northwest	Up-gradient	J87	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-gallon #2 fuel oil UST that are all closed-in-place.

Based on distance from the Site, assumed hydraulic relationship, the lack of known releases with the potential to affect the Site, and/or current regulatory status, none of the other facilities identified within one-quarter mile of the Site in the PBS database are expected to impact the environmental integrity of the Site.

NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)

The NYSDEC chemical bulk storage (NY CBS UST/AST) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS UST/AST database lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons and/or in underground tanks of any size. The Site was not identified on the NY CBS UST/AST database.

One facility was listed within one-quarter mile of the Site. This NY CBS UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	584-ft/Northwest	Cross-gradient	F71	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS, and NY Spills databases.

NY Chemical Bulk Storage (NY CBS)

The NYSDEC chemical bulk storage (NY CBS) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons. The Site was not identified on the NY CBS database.

Two (2) facilities were listed within one-quarter mile of the Site. The following facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	584- ft/Northwest	Cross-gradient	F71	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Based on its distance from the Site, the other NY CBS listing is not anticipated to have affected the environmental integrity of the Site.

Historical Bulk Storage Tanks (USTs/ASTs)

These facilities have petroleum bulk storage capabilities in excess of 1,100 gallons and less than 400,000 gallons. This database contains detailed information per site. This database is no longer updated. More current data is presented in the PBS UST/AST databases. The Site is not listed in the HIST UST/AST databases.

The database identified the presence of one (1) historic UST facility located within one-quarter mile of the Site. This HIST UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	753- ft/Northwest	Up-gradient	J87	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-gallon #2 fuel oil UST that are all closed-in-place.

New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)

The Voluntary and Brownfield remedial programs involve mostly private entities and private funds to remediate contaminated sites and return the properties to productive use. The NYSDEC VCP/BCP database was researched to identify listings for the Site and within a one-mile radius of the Site. The Site is not listed in the VCP/BCP databases.

One (1) BCP facility is listed within one mile of the Site. Based on its distance from the Site and/or inferred down-gradient groundwater flow direction, this BCP listing is not anticipated to have affected the environmental integrity of the Site.

E-Designation Site Listing (E-Designation)
The E (Environmental) Designation would ensure that sampling and remediation take place on the subject properties, and would avoid any significant impacts related to hazardous materials at these locations. The E-designations require that the owner of the sites conduct testing and sampling following set protocols, to the satisfaction of city agencies. In addition, the owner must remediate when appropriate. The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing for the Site for hazardous materials is considered to be a REC/VEC.

The database identified thirty (30) E-Designation listings within a one-eighth-mile radius of the Site. The listings are associated with E-designation reference No. E-39 (Underground Gasoline Storage Tanks Testing Protocol) and E-175 (Underground Gasoline Storage Tanks Testing Protocol). The listed sites are all considered as RECs/VECs with respect to the Site.

Registered Dry Cleaners
The NYSDEC registered dry cleaners database was researched to identify listings within one-quarter mile of the Site. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the dry cleaners database.

EDR Exclusive Historic Auto Stations (EDR US Hist Auto Stat)
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is not listed in the EDR US Hist Auto Stat database.

The database search identified 39 listings within one-quarter mile of the Site. The EDR Hist Auto Stat facilities that are considered RECs/VECs with respect to the Site are as follows:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
105-02 Merrick Blvd. Jamaica, NY 11433	26 feet/ Northeast	Cross-gradient	A2	Identified as Garvey's Auto Repair and Ralke Auto Repairs. Listed for years 1999, 2000, 2011, and 2012.
105-09 Merrick Blvd. Jamaica, NY 11433	72 feet/ East-northeast	Cross-gradient	A12	Identified as Inter City Tire Corp. Listed for year 2006.
105-15 Merrick Blvd. Jamaica, NY 11433	74 feet/ East-northeast	Cross-gradient	A13	Identified as Citgo Gas Station and Henrys Repair Shop. Listed for years 1999-2001.
105-17 Merrick Blvd. Jamaica, NY 11433	74 feet/ East-northeast	Cross-gradient	A14	Identified as Fred's Auto Repair. Listed for year 2002.

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
106-04 Merrick Blvd. Jamaica, NY 11433	218 feet/ East-southeast	Down-gradient	A17	Identified as Birds Auto Repair. Listed for years 1999-2012.
106-03 Merrick Blvd. Jamaica, NY 11433	224 feet/ East-southeast	Down-gradient	A19	Identified as Truck Repair Services. Listed for years 2011 and 2012.
104-28 Merrick Blvd. Jamaica, NY 11433	241 feet/ North-northwest	Cross-gradient	B20	Identified as AAA Transmissions & Engines. Listed for years 2004, 2005, and 2009.
104-21 Merrick Blvd. Jamaica, NY 11433	259 feet/ North-northwest	Up-gradient	B23	Identified as Taylor Auto Collision Inc. Listed for years 1999-2002, 2004-2009, and 2011.
104-19 Merrick Blvd. Jamaica, NY 11433	264 feet/ North-northwest	Up-gradient	B24	Identified as Full Line Auto Repairs. Listed for years 1999-2001, 2003-2007, and 2009-2012.
104-15 Merrick Blvd. Jamaica, NY 11433	278 feet/ North-northwest	Up-gradient	B27	Identified as Dynamic Autoworks Inc., Ace Auto Body & Truck Repair, Jimmy's Trans & Auto Repair, and Sports Line Auto Repair. Listed for years 1999-2005, 2008, 2010, and 2012.
104-13 Merrick Blvd. Jamaica, NY 11433	284 feet/ North-northwest	Up-gradient	B31	Identified as Full Line Auto Repairs. Listed for year 2002.
104-09 Merrick Blvd. Jamaica, NY 11433	297 feet/ North-northwest	Up-gradient	B33	Identified as Junior Auto Collision, RJS Car Care Center Inc., L&C Auto Collision, NASCAR Auto Body Inc., and Integrity Collision & Towing. Listed for years 2001-2012.
103-16 Merrick Blvd. Jamaica, NY 11433	496 feet/ North-northwest	Cross-gradient	B50	Identified as The Car Doctor and Breeze Auto Collision & Repair. Listed for years 1999-2001 and 2003.
107-17 Merrick Blvd. Jamaica, NY 11433	553 feet/ Southeast	Down-gradient	D63	Identified as E&D Auto Seat Cover, Dave's Precision Auto Service Inc., Inspection City Auto Repair Inc., and Haldane Auto Service. Listed for years 1999-2008 and 2010-2012.

Due to their distances from the Site and/or the presumed groundwater flow direction none of the other EDR Hist Auto Stat facilities are considered RECs/VECs with respect to the Site.

EDR Exclusive Historic Dry Cleaners (EDR US Hist Cleaners)

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is not listed in the EDR US Hist Cleaners database.

The database search identified one (1) listing within one-half mile of the Site. This facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
107-37 166th Street Jamaica, NY 11433	777 feet/ South-southeast	Down-gradient	G90	Identified as ABD Cleaners Corp. Listed for year 2009.

NY Manifest

The NY Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the NY Manifest database.

Nineteen (19) NY Manifest facilities were identified within one-quarter mile of the Site. The following NY Manifest facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	378-ft/East-southeast	Cross-gradient	D39	EPA ID: NYD987030012. The Site is also listed on the RCRA NonGen / NLR database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	753-ft/Northwest	Up-gradient	J86	EPA ID: NYD986903763. The Site is also listed on the RCRA NonGen / NLR database. The facility is a retail gasoline filling station.
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	218-ft/East-southeast	Down-gradient	A18	EPA ID: NYD981874407. The Site is also listed on the RCRA NonGen / NLR database.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NY Manifest facilities are expected to impact the environmental integrity of the Site.

NJ Manifest

The NJ Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the NJ Manifest database.

Four (4) NJ Manifest facilities were identified within one-quarter mile of the Site. The following NJ Manifest facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCT 165-18 South Road Jamaica, NY 11433	584-ft/Northwest	Cross-gradient	F70	The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NJ Manifest facilities are expected to impact the environmental integrity of the Site.

RI Manifest

The RI Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the RI Manifest database.

One (1) RI Manifest facility was identified within one-quarter mile of the Site. The following RI Manifest facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCT 165-18 South Road Jamaica, NY 11433	584-ft/Northwest	Cross-gradient	F70	The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Manufactured Gas Plant Sites (Coal Gas)

Manufactured gas sites were used in the United States from the 1800's to the 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water and produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils, and other compounds are potentially hazardous to human health and the environment. The byproducts were frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination. The Manufactured Gas Plant (MGP) Sites database was researched to identify any listings for the Site and within a one-mile radius of the Site. The Site is not listed in the MGP database.

One (1) facility within one mile of the Site is listed in the MGP database. The facility is identified as Jamaica Gas and Light and is located approximately 3,093-ft west of the Site at Beaver Road and 158th Street. Due to its distance from the Site and/or the presumed groundwater flow direction this facility is not considered a REC/VEC with respect to the Site.

Orphan Listings

A review of the Orphan Listings in the database search report indicated a total of four (4) listings. The Orphan sites are not considered RECs based on their estimated distances from the Site (none adjacent or on the Site block) and/or the nature of the activity/release.

6.2 Local Regulatory Agency Research

A review of local records for the Site was accomplished by contacting offices of New York City regulatory agencies including the NYCDOB, NYCDEP, Department of Health and Mental Hygiene (NYCDOHMH), NYCDCP, and the Fire Department (FDNY). The results of the review of local records are presented below. Copies of the correspondences are included in *Appendix K.*

New York City Department of Buildings (NYCDOB)
NYCDOB records were reviewed on November 13, 2015 to determine whether there are references to buildings, tanks or other structures, property use or inspection reports that indicate the presence, past use, or release of hazardous substances, wastes, or petroleum products at the Site. The NYCDOB records review indicated that the Site has one (1) NYCDOB violation. This violation was for an unsafe building condition. The violation was dismissed. There were no RECs identified as a result of review of NYCDOB records. Copies of the NYCDOB records are included in *Appendix J*.

New York City Department of Environmental Protection (NYCDEP)
The NYCDEP maintains files of incidents involving environmentally regulated materials. The records maintained by NYCDEP include reports of spills of hazardous chemicals and citizen's complaints on environmental issues. NYCDEP information concerning the Site was requested in a formal application for records dated October 1, 2015. At the time this report was issued, STV had not yet received a response from NYCDEP. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of Health and Mental Hygiene (NYCDOHMH)
The NYCDOHMH, Bureau of Environmental Investigations (BEI) maintains files of health-related environmental incidents in the City of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYCDOHMH information concerning the Site was requested in a formal FOIL request form dated October 1, 2015. NYCDOHMH acknowledged the request on October 6, 2015. At the time this report was issued, STV had not yet received any response from NYCDOHMH. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of City Planning (NYCDCP)
STV reviewed the NYCDCP Zoning Map 14d, available via the NYCDCP on-line web-site. According to the map, the Site is currently located within zone “M1-1”, which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

“E” designations for blocks or lots on city zoning maps were issued since approximately March 2003 and indicate that potential environmental issues are associated with these parcels. The environmental issues may or may not be associated with potential contamination by hazardous or petroleum substances. Parcels with “E” designations require that the fee owner of the site conduct a testing and sampling protocol, and remediation where appropriate, to the satisfaction of the New York City Office of Environmental Remediation (NYCOER) before the issuance of a building permit by the NYCDOB pursuant to the provisions of Section 11-15 of the Zoning Resolution (Environmental Requirements).

The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing for the Site for hazardous materials is considered to be a REC/VEC.

New York City Fire Department (FDNY)

The FDNY maintains information concerning petroleum USTs. STV submitted a Fuel Oil Record Search Request Form to the FDNY on October 1, 2015 for information concerning the Site. At the time this report was issued, STV had not yet received a response from FDNY. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

7.0 USER RESPONSIBILITIES

7.1 Environmental Liens or Activity and Use Limitations

An Environmental Lien Search Report was obtained from EDR for the Site. The Environmental Lien Search Report provides results from a search of available and current land title records for environmental liens and other activity and use limitations, such as engineering controls and institutional controls. A review of the report indicates that no environmental liens or other activity and use limitations were found for the Site. A copy of the environmental lien search report is included in *Appendix J*.

7.2 Valuation Reduction for Environmental Issues

No information was available at the time of the assessment regarding the relationship of the purchase price of the property to the fair market value of the property. If information is received regarding valuation reduction for environmental issues which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.3 Knowledge or Experience of the User

No person with specialized knowledge or experience that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.4 Commonly Known or Reasonably Ascertainable Information

No person within the local community with commonly known or reasonably ascertainable information about the property that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.5 The Degree of Obviousness of the Presence or Likely Presence of Contamination at the Property

NYCT is not currently aware of any obvious indicators that point to the presence or likely presence of new or imminent releases at the property. Additionally, NYCT is not currently aware of any obvious indicators important to the screening of VECs in connection with the property.

8.0 SITE RECONNAISSANCE AND INTERVIEWS

8.1 Methodology and Limiting Conditions

The inspection of the Site included observations of the property and surrounding area (Site reconnaissance) that were made to identify potential sources or indications of hazardous substances, including: ASTs; USTs; tank vents and fill ports; transformers and other items that could contain PCBs; waste storage areas; hazardous materials usage, storage, and disposal; stained surfaces and soils; stressed vegetation; leaks; and, odors. In addition, readily-observable portions of the properties immediately adjacent to the Site were viewed from public rights-of-way to identify or determine the likelihood of any of the aforementioned potential sources of contamination being present. There were no limiting conditions with respect to impact on the accuracy of the Site reconnaissance.

8.2 Site Reconnaissance

Mr. Doane Cafferty of STV performed the Site visit on November 12, 2015. A request for access to the Site was communicated in a letter dated October 27, 2015 that was mailed to several representatives of WP Plaza, Inc. At the time this visit was conducted, STV had not yet received a response from anyone at WP Plaza Inc. Consequently, the site inspection was conducted from the public sidewalk in front of the Site. At the time of the inspection, the weather was approximately 50º F with sunny skies. The weather did not prevent STV from conducting a thorough inspection of the Site and surrounding areas. *Appendix C* provides representative photographs of the Site.

Block 10164, Lot 76 is an approximately 4,250 square-foot (sf) property that is a fenced vacant lot used for parking. The Site is covered with an asphaltic surface. Two cars and two panel trucks were parked in the lot. Some of the lot was overgrown with weeds.

The Site is bound to the north by a custom wheel, tire, and rim supply and repair shop and subsequently by several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south by a one-story commercial office building followed by bus depot parking lots, a mixed-use residential/commercial building, an auto collision repair shop, and subsequently 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street.

8.3 Current and Historical Use Interviews

The following knowledgeable persons were interviewed with regard to the Site pursuant to ASTM 1527-13 Section 10:

8.3.1 Current Property Owner

The subject property is currently owned by 'WP Plaza, Inc.'. Based on the research, this entity has owned the Site since at least 2013. All prior ownership information reviewed is presented in *Appendix J*. The review of current and historical ownership and tax records information did not reveal evidence of RECs or VECs associated with prior use of the Site.

8.3.2 Current Site Operator or Key Site Manager

Name	Title/Company	Years Associated with Site
Mr. Joseph Atarien; Mr. John Khani; and Mr. David Manesh	WP Plaza Inc.	NA

Detailed information provided during the above-listed interview is documented on Record of Communication forms in *Appendix K.*

8.3.3 Site Occupants

Other than the Owner's representative, Site occupants were not available to interview during this assessment.

8.3.4 Past Owners, Operators and Occupants

Past owners or occupants of the Site were not available to interview during this assessment. STV was unable to obtain contact information from any previous owners or occupants.

8.3.5 Report User

Name	Title/Company	Years Associated with Site
Mr. Emil Dul	NYCT Real Estate Department	<1

According to the ASTM E 1527-13 User Questionnaire provided by Mr. Emil Dul of NYCT's Real Estate Department, NYCT is not aware of any environmental liens, land use limitations, specialized knowledge, or past uses of the Site. Detailed information provided during the above-listed interviews is referenced in applicable sections of this report and a copy of the completed ASTM E1527-13 User Questionnaire is included in *Appendix K.*

8.4 Hazardous Substances and Petroleum Products Storage and Handling

8.4.1 Hazardous Substances

No hazardous substances were stored or located on the Site. There was no visual or olfactory evidence of leakage or staining anywhere on the Site. STV concludes that storage and handling of hazardous substances do not represent a REC or VEC for the Site.

8.4.2 Petroleum Products Storage and Handling

No evidence of petroleum product storage was observed at the Site. STV concludes that storage and handling of petroleum products does not represent a REC or VEC for the Site.

8.5 Solid Waste Generation, Storage and Disposal

No containers for solid waste were observed on the Site. Solid waste generation, storage, and disposal are not considered a REC or a VEC with respect to the Site.

8.6 Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are toxic components of various products including, but not limited to caulking materials, light ballasts, and dielectric and hydraulic fluids that were formerly used in electrical equipment such as transformers and hydraulic elevators/lifts. The manufacture and use of PCBs was banned in the United States in 1978.

STV did not observe any electrical transformers on or adjacent to the Site. Potential buried structures and historic fill on the property could include PCB-containing materials and is considered an environmental concern with respect to the Site.

8.7 Asbestos-Containing Material (ACM)

STV conducted a limited visual survey (i.e., within accessible areas only) for the presence of suspect ACM within the Site. The intent of the survey was to identify exposed suspect ACM through preliminary non-destructive observations. No sampling of suspect ACM was performed during this investigation. Pursuant to applicable asbestos control regulations and guidelines, STV considered any observed suspect materials to be asbestos-containing.

Potential ACM at the Site likely consists of historical fill material. Based on the fact that the fill material is of an unknown origin, the suspect ACM identified at the Site is considered an environmental concern.

8.8 Lead-Based Paint (LBP) Survey

During the Site inspection, there was no evidence of painted surfaces since the land is vacant. Potential buried structures and historic fill on the property could include LBP and is considered an environmental concern with respect to the Site.

8.9 Regulatory Compliance

STV does not consider regulatory compliance to be an environmental concern for the Site.

8.10 Electromagnetic Fields

A visual inspection was performed for the presence of high voltage power lines and or substations located in close proximity to the Site. No such power lines or substations were identified; therefore, STV does not consider electromagnetic fields to be an environmental concern at the Site.

8.11 Other Environmental Concerns (Methane, Mold, etc.)

Based on a review of the historic topographic map and knowledge of the area, the Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site.

As part of this assessment, STV conducted a limited assessment for the presence of water damage and odors, indicative of the potential for mold growth, on accessible surfaces within the Site. There was no evidence of water damage or mold noted during the Site inspection.

9.0 SUMMARY OF FINDINGS

The Site is located at 104-32 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 76). Block 10164, Lot 76 is an approximately 4,250 square-foot (sf) property that is a fenced vacant lot used for parking.

The Site is bound to the north by a custom wheel, tire, and rim supply and repair shop and subsequently by several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south by a one-story commercial office building followed by bus depot parking lots, a mixed-use residential/commercial building, an auto collision repair shop, and subsequently 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street.

NYCDCP Zoning Map 14d indicated the Site is designated as zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol).

The Site is generally flat and the topography of the surrounding area slopes to the south-southeast. According to the USGS 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, and information contained in the regulatory agency database report, the Site elevation is approximately 30 feet amsl.

The nearest surface water body is a pond in Captain Tilly Park, located approximately 4,600 feet north-northwest of the Site. Based on topography, the groundwater flow in the area of the Site is assumed to be south-southwest towards Jamaica Bay. The depth to groundwater is estimated to range from approximately 20-25 feet bgs.

The Phase I ESA identified on-Site RECs pertaining to potential buried structures from former buildings that could contain underground storage tanks and/or historic fill materials of unknown origin; the historical use of the Site as a paint supply company; and the Site's listing with an E-Designation for underground storage tanks testing protocol.

Off-site RECs include three solid waste management facilities; a nearby facility with an open spill; one facility that currently generates spent halogenated solvents; one facility that historically generated cadmium, lead, and waste oils; an active gas station; several historical and current auto repair facilities; one historic dry cleaner; several nearby properties with E-Designation listings for underground storage tanks testing protocol; and the historical presence of a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs in close proximity to the Site. The Phase I ESA revealed environmental concerns associated with suspect ACM, LBP, PCB-containing materials.

10.0 CONCLUSIONS AND RECOMMENDATIONS

STV has performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527-13 and the requirements of NYCT. Any additions to, exceptions to, or deletions from this practice are described in Section 2.0 of this report.

The Phase I ESA has revealed the following RECs, CRECs, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The historic use of the Site as a paint supply company is considered a REC/VEC.

- The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that generates spent halogenated solvents is located in close proximity to the Site and is considered a REC/VEC.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- A facility with an open spill is located northwest of the Site at 165-18 South Road. This property is considered a REC/VEC based on its proximity to the Site and hydraulically cross-gradient position with respect to the Site.

- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Potential buried structures and historic fill on the property could include ACM, LBP and/or PCB-containing materials.

Recommendations

STV recommends performing a Phase II Environmental Site Investigation, consisting of a geophysical survey and the collection and analysis of soil and groundwater samples to determine whether the identified RECs have impacted the value of the Site or the development and use of the Site.

11.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

STV Incorporated (STV) has performed a Phase I ESA of the property located at 104-32 Merrick Boulevard, Jamaica, New York 11433 (Block 10164, Lot 76). The scope of the Phase I ESA was consistent with the requirements of ASTM Standard Practice E 1527-13 and of NYCT. Signatures of the Environmental Professionals who participated in conducting this Phase I ESA are provided below. Qualifications for these individuals are provided in *Appendix L*. STV declares that to the best of their professional knowledge and belief, they meet(s) the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. STV has the specific qualifications based on education, training and experience to assess the subject property. STV has developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

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Prepared By:
Doane E. Cafferty, LEED AP BD+C
Senior Environmental Scientist

_____

Reviewed By:
Christine Vilardi, P.G., LEED Green Associate
Quality Control Officer

_____

Reviewed By:
Peter S. Helseth, P.E.
Senior Project Manager

12.0 REFERENCES

Persons Interviewed:

- Mr. Joseph Atarien, WP Plaza Inc., 104-32 Merrick Blvd., Jamaica, Queens, New York, DATE TBD.

Resources Consulted:

- EDR – Radius Map™ Report with GeoCheck®, September 29, 2015.
- EDR – Historical Sanborn® Maps: 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006.
- EDR – Aerial Photographs: 1924, 1951, 1954, 1961, 1966, 1975, 1984, 1994, 2006, 2009, and 2011.
- EDR – USGS Historical Topographic Maps: 1900, 1924, 1947, 1957, 1966, 1979, and 1994.
- EDR – City Directories: 1922, 1934, 1939, 1945, 1950, 1962, 1967, 1970, 1976, 1983, 1991, 1996, 2000, 2005, 2008, and 2013.
- EDR - Environmental Lien Search dated September 30, 2015.
- NYC Department of Finance – Assessment Roll: 2006-2015.
- Oasis Website - www.oasisnyc.net/OASISMap.htm.
- FEMA Map Services Center Website - www.msc.fema.gov
- National Wetlands Inventory Website - www.fws.gov/nwi/
- USGS New York Water Science Center http://ny.ims.er.usgs.gov/li-dtw/ and http://ny.ims.er.usgs.gov/LI_maps06

Regulatory Agencies Contacted:

- New York City Department of Buildings, October 1, 2015.
- New York City Fire Department, October 1, 2015.
- New York City Planning and Zoning Department, October 1, 2015.
- New York City Department of Environmental Protection, October 1, 2015.
- New York City Department of Health and Mental Hygiene, October 1, 2015.
- New York State Environmental Conservation, October 1, 2015.
- New York State Department of Health, October 1, 2015.
- Unites States Environmental Protection Agency, October 1, 2015.

Documents and Maps:

- ASTM International (ASTM) 2013, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," ASTM Designation E 1527-13.
- ASTM E 2600-10 "Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions."
- STV Potential Property Acquisition Eight Properties Near Jamaica Bus Depot, Jamaica, New York, dated February 17, 2012.
- U.S. Geological Survey, Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, Charles Baskerville, 1994. USGS I 2306.
- U.S. Geological Survey, Groundwater in Bronx, New York and Richmond Counties with Summary Data on Kings and Queens Counties, New York City, New York, Nathaniel Perlmutter and Theodore Arnow, 1953. USGS 6W-32.

- Water Supply Paper 2498 (USGS 1999) Ground-Water Resources of Kings and Queens Counties, Long Island, New York by Herbert Buxton and Peter Schernoff.
- USGS LI Depth-to Water Tool for Long Island (USGS, 2013).

13.0 APPENDICES

Appendix A - Site Location Map
Appendix B - Site Plan
Appendix C - Site Photographs
Appendix D - National Wetlands Inventory Map
Appendix E - FEMA Flood Insurance Rate Map
Appendix F - Historical Topographic Maps
Appendix G - Historical Aerial Photographs
Appendix H - Historical Sanborn Fire Insurance Maps
Appendix I - Regulatory Agency Database Report
Appendix J - Supporting Documents
Appendix K - Records of Communication & Agency Correspondence
Appendix L - Qualifications of Environmental Professionals

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Phase I ESA - 105-02 Merrick Boulevard

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PHASE I ENVIRONMENTAL SITE ASSESSMENT
OF

105-02 MERRICK BOULEVARD
BLOCK 10164, LOT 79
JAMAICA, QUEENS, NEW YORK 11433

CONTRACT NO.: CM-1411/D-61162
TASK ORDER NO.: 24
CONSULTANT PROJECT NO.: 30-17749-0001

AUGUST 24, 2016

Prepared by:

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1.0 EXECUTIVE SUMMARY

At the request of New York City Transit (NYCT), STV Incorporated (STV) conducted a Phase I Environmental Site Assessment (ESA) of the property located at 105-02 Merrick Boulevard, Jamaica, Queens, New York 11433 (hereafter referred to as the "Site"). The legal description of the Site is Block 10164, Lot 79. NYCT is evaluating the feasibility of acquiring the Site for the Jamaica Bus Depot reconstruction.

Block 10164, Lot 79 is an approximately 8,800 square-foot (sf) property that contains a one-story building constructed in 1937. The building has two units. The front unit is currently occupied by a Dominos Pizza franchise and the back unit is currently occupied by an appliance repair shop. The Site is owned by "George Williams." according to the Environmental Data Resources (EDR) Environmental Lien Search. Historically, the Site was occupied by a cabinet manufacturer, a furniture store, and a restaurant. The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

The main objective of the Phase I ESA is to identify *recognized environmental conditions (RECs)* and environmental concerns that may affect the suitability of the Site for acquisition and redevelopment. RECs are defined in ASTM International (ASTM) Standard Practice E 1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property. Note that *controlled recognized environmental conditions (CRECs)* are considered to be RECs and are listed in the Executive Summary and Conclusions of this Phase I ESA. Additionally, *vapor encroachment conditions (VECs)* were evaluated as per ASTM E 2600-10.

Other environmental issues and conditions that, in the opinion of the *environmental professional* conducting the assessment, would not be considered *RECs* are identified in this assessment. These may include *historical RECs* and/or *de minimis* conditions. The Phase I ESA also includes a preliminary evaluation of specific potential environmental issues or conditions that are, according to ASTM E 1527-13, considered non-scope considerations. These issues include radon, asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing light ballasts and caulking materials, exterior lead-based paint (LBP), chemical storage, wetlands, regulatory compliance issues, dry cleaner and other industrial emissions, mold, biological agents, electromagnetic fields, and methane. The Phase I ESA included a review of Federal, State, and local records, previous reports and historical documents; visual observation of the Site and adjoining properties; and, interviews with selected Site representatives.

The assessment requested by NYCT is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included evaluation of the following: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-site solid waste management and disposal practices; on-site hazardous materials and petroleum products management; chemical storage, ACM, PCBs and exterior LBP management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions; radon; mold and moisture intrusion; biological agents; electromagnetic fields; and, potential for methane generating materials.

Summary of RECs, CRECs, VECs and Environmental Concerns

This Phase I ESA has revealed the following RECs, CRECS, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The historic use of a portion of the Site as an auto repair facility is considered a REC/VEC.

- The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that generates spent halogenated solvents is located in close proximity to the Site and is considered a REC/VEC.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- A facility with an open spill is located northwest of the Site at 165-18 South Road. This property is considered a REC/VEC based on its proximity to the Site and hydraulically cross-gradient position with respect to the Site.

- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Based on the age of the Site building (circa 1937), there is the potential for the presence of suspect ACM.
- Based on the age of the Site building (circa 1937), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.
- Potential buried structures, historic fill, fluorescent lighting fixtures, and window caulking may contain PCBs.

STV recommends that any ACM, LBP, and/or PCB-containing materials affected by future renovations, repairs or demolition at the Site be identified and properly managed during such activities. If the NYCT considers purchasing the property in the future, or if future development requires soil disturbance, a comprehensive Phase II Environmental Site Investigation should be conducted.

2.0 INTRODUCTION

This report summarizes the results of the Phase I Environmental Site Assessment (ESA) of the property located at 105-02 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 79) (hereafter referred to as the "Site"). Block 10164, Lot 79 is an approximately 8,800 square-foot (sf) property that contains a one-story building constructed in 1937. The building has two units. The front unit is currently occupied by a Dominos Pizza franchise and the back unit is currently occupied by an appliance repair shop. NYCT is evaluating the feasibility of acquiring the Site for the Jamaica Bus Depot reconstruction.

The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

Mr. Doane Cafferty of STV performed the Site visit on November 12, 2015. A request for access to the Site was communicated in a letter dated October 27, 2015 that was mailed to Mr. George Williams (the property owner) and Fearonce G. La Lande, Esq. (Mr. William's attorney). At the time this visit was conducted, STV had not yet received a response from either Mr. Williams or Mr. La Lande. Consequently, the site inspection was conducted from the public sidewalk in front of the Site. The weather was approximately 50º F with sunny skies; there were no limitations caused by the weather.

2.1 Selected Definitions

The following terms are used throughout this report and, for the purpose of clarity, corresponding definitions are provided. These terms are fully defined in ASTM E 1527-13 and ASTM E 2600-10.

Controlled Recognized Environmental Condition (CREC) – A recognized environmental condition resulting from a past *release* of *hazardous substances* or *petroleum products* that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority) with *hazardous substances* or *petroleum products* allowed to remain in place subject to the implementation of required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Historical Recognized Environmental Condition (HREC) – A past *release* of any *hazardous substances* or *petroleum products* that occurred in connection with the *property* and has been addressed to the satisfaction of the applicable regulatory authority, without subjecting the *property* to any required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Recognized Environmental Condition (REC) – The presence or likely presence of any *hazardous substances* or *petroleum products* in, on, or at a *property:* (1) due to any *release* to the *environment*; (2) under conditions indicative of a *release* to the *environment*; or, (3) under conditions that pose a *material threat* of a future *release* to the *environment*.

Environmental Professional - A person meeting the education, training, and experience requirements as set forth in 40 CFR § 312.10(b), necessary to conduct a *site reconnaissanc*e, *interview*s, and other activities in accordance with this practice, and from the information generated by such activities, having

the ability to develop opinions and conclusions regarding conditions indicative of releases or threatened releases on, at, in, or to a property, sufficient to meet the objectives and performance factors in 40 CFR § 312.20(e) and (f).

Vapor Encroachment Condition (VEC) - The presence or likely presence of chemical of concern vapors in the subsurface of the target property caused by the release of vapors from contaminated soil or groundwater or both either on or near the target property.

2.2 Purpose and Scope

The purpose of this assessment is to identify RECs, CRECs, VECs, and certain other environmental issues or concerns as they existed at the Site at the time of the Site visit. The assessment is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser, or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included, but was not limited to an assessment of the following potential environmental issues: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-Site solid waste management and disposal practices; on-Site hazardous materials and petroleum products management; asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing equipment and lead-based paint (LBP) management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions, radon, mold and moisture intrusion; biological agents; electromagnetic fields; and the potential for methane generating materials.

This evaluation was conducted by qualified *environmental professionals* utilizing a standard of good commercial and customary practice in accordance with ASTM E 1527-13. The scope of work completed for this evaluation meets all requirements of ASTM E 1527-13 and includes the following:

- Documenting the physical characteristics of the Site through a review of available topographic, geologic, wetland, flood plain, groundwater data and Site observations.

- Researching the Site history through a review of reasonably ascertainable standard sources such as land deeds, fire insurance maps, city directories, aerial photographs, prior reports and interviews.

- Documenting current Site conditions, via observations and interviews, regarding the presence or absence of hazardous substances/petroleum products; the generation, treatment, storage, or disposal of hazardous, regulated, or medical wastes; the presence of electrical equipment that utilizes oils which potentially contain PCBs; and, the presence of storage tanks (above and below ground), floor drains, drains that discharge to subsurface, former septic tanks and drywells.

- Determining the usage of adjoining and nearby properties to identify the likelihood for environmental conditions (if present and/or suspected) and concerns to migrate onto the Site.

- Evaluating information contained within Federal and State environmental databases and other local environmental records, within specific search distances.

2.3 Additions, Deviations, Deletions, Data Failures, and Data Gaps

The following environmental issues that are outside the scope of (additions to) ASTM E 1527-13 were evaluated:

- A review of available radon data for the Site vicinity.
- A review of available wetlands data.
- A visual assessment for water damage and mold.
- A visual assessment for suspect ACM.
- A visual assessment for suspect LBP.
- An assessment of potential methane generation on-Site or migration to the Site.
- Regulatory compliance.
- PCB light ballasts and caulking materials.
- Biological agents (mold, pigeon guano, medical wastes, etc.).
- Air emissions from drycleaners and other industrial sources.
- An assessment of the potential presence of electromagnetic fields (EMF).
- An assessment of any dust generating activities on or near the Site.

The following deviations, data gaps and deletions from ASTM E 1527-13 were necessary in conducting this assessment:

- The Site area history was not conducted in five-year intervals. However, sufficient information about the history of the Site and surrounding area could be obtained from the available historical fire insurance maps, aerial photographs, city directories, and local records and this data gap is not likely to alter the conclusions of this report.
- The Site reconnaissance was conducted from the sidewalk area in front of the Site because access was not granted by the owner or a representative of the owner at the time of the inspection.

2.4 Limitations and Exceptions

STV has prepared this Phase I ESA using reasonable efforts in each phase of its work to identify RECs associated with hazardous substances, wastes and petroleum products at the Site. The methodology of the Phase I ESA was consistent with the ASTM E 1527-13. Findings within this report are based on information collected from observations made on the day of the Site investigation and from reasonably ascertainable information obtained from governing public agencies and private sources.

This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation, or other construction purposes. STV makes no representation or warranty that the past or current operations at the Site are or have been in compliance with all applicable Federal, State and local laws, regulations and codes.

Regardless of the findings stated in this report, STV is not responsible for consequences or conditions arising from facts that were concealed, withheld, or not fully disclosed at the time the evaluation was conducted.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The regulatory database report provided is based on an evaluation of the data collected and compiled by a contracted data research company. The report focuses on the Site and neighboring properties that could impact the Site. Neighboring properties listed in governmental environmental records are identified

within specific search distances. The search distance varies depending upon the particular government record being checked. The regulatory research is designed to meet the requirements of ASTM E 1527-13. The information provided in the regulatory database report is assumed to be correct and complete.

3.0 SITE DESCRIPTION

3.1 Site Location and Legal Description

The Site is located at 105-02 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 79). Block 10164, Lot 79 is an approximately 8,800 square-foot (sf) property that contains a one-story building constructed in 1937. The building has two units. The front unit is currently occupied by a Dominos Pizza franchise and the back unit is currently occupied by an appliance repair shop.

The Site is located in the Jamaica neighborhood of Queens. The Site is "E" designated according to the New York City Department of City Planning (NYCDCP) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). A map showing the location of the Site is presented in *Appendix A*. A Site Plan showing the Site's physical layout including adjacent land use is presented in *Appendix B*. Photographs of the Site and surrounding areas are included in *Appendix C*.

The Site is bound to the north by a parking lot followed by a custom wheel, tire, and rim supply and repair shop and subsequently by several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south by bus depot parking lots, a mixed-use residential/commercial building, an auto collision repair shop, and subsequently 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street. No changes to the Site were observed since the most recent Sanborn Map (2006).

The surrounding area is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR.

According to information obtained through the New York City Department of City Planning (NYCDCP) website, the Site is currently located within zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

3.2 Physical Setting

3.2.1 Topography

According to the United States Geological Survey (USGS) 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, the elevation of the Site is approximately 30 feet above mean sea level (amsl). The topography of the immediate Site area was observed to be sloping to the south-southeast. A copy of the topographic map is presented in *Appendix A*.

3.2.2 Geology

The geology of Queens County can be characterized as a wedge-shaped layer of Cretaceous and Pleistocene unconsolidated sediments, thickening to the south-southeast. Several impermeable clay layers are found within this sediment package, generally creating three distinct aquifers. Consolidated crystalline bedrock is of Precambrian age. The thickness of the unconsolidated sequence ranges from zero to approximately 1,300 feet below ground surface (bgs) from north to south. The southernmost portions of Queens, including portions of the Rockaways, consist of glaciofluvial sediments derived from melt-water of

the retreating glaciers. Depth to bedrock within the vicinity of the Site is at least 600 feet bgs (as per "Ground-Water Resources of Kings and Queens Counties, Long Island, New York, by Herbert Buxton and Peter Schernoff, dated 1999).

3.2.3 Soils

According to the GeoCheck Section of the regulatory agency database report (*Appendix I*), the soil in the area of the Site is described as Urban Land. Urban Land refers to soils that have been altered by human activities thus making them unidentifiable. Typically, these soils have been mixed with other materials, such as brick and concrete (urban fill), and characteristics can only be determined by on-site investigation. Other surficial soil types in the area of the Site consist of silt loam, loamy sand, sandy loam, and fine sandy loam. Sandy loam refers to a soil that's made of sand, silt, and clay.

3.2.4 Hydrology

Generally, groundwater contour lines mimic the surface topography and groundwater flow direction is perpendicular to these contour lines flowing from higher to lower elevation. According to USGS digital elevation data provided by Environmental Data Resources, Inc. (EDR) of Milford, Connecticut (*Appendix I*) and the USGS 7.5-minute Quadrangle map, *Jamaica, NY*, 2013, groundwater in the vicinity of the Site is inferred to flow to the south-southwest towards Jamaica Bay. According to "Water Table Altitude in Kings and Queens Counties, New York in March 1997" (USGS, 1997) depth to groundwater is anticipated to range from approximately 20 to 25 feet bgs. Estimated groundwater levels and/or flow direction(s) may vary due to seasonal fluctuations in precipitation, local usage demands, geology, underground structures, or dewatering operations. The groundwater in the vicinity of the Site is not known to be used for human consumption, as most potable water in the area is derived from upstate reservoirs managed by New York City; the Site area is serviced by the City water supply.

STV did not observe any retention ponds or other surface water bodies on the Site. The nearest surface water body is a pond in Captain Tilly Park, located approximately 4,600 feet north-northwest of the Site. Another pond, Baisley Pond, is located approximately 1.42 miles south of the Site. Bergen Basin, an inlet off Jamaica Bay, is located approximately 3.0 miles south-southwest of the Site.

STV reviewed the United States Fish and Wildlife Service National Wetlands Inventory (NWI) map for the area of the Site (http://www.fws.gov/wetlands/data/index.html) to determine if the Site is located in a regulated wetlands area. Based on a review of the map, the Site is not located within a regulated wetlands area. A copy of the wetlands map is included in *Appendix D*.

The Federal Emergency Management Agency (FEMA) Region II Coastal Analysis and Mapping Preliminary Flood Maps & Data website (http://www.region2coastal.com/view-flood-maps-data/view-preliminary-flood-map-data/) was reviewed to assess whether the Site is located within a designated flood plain or flood zone. According to the revised preliminary FIRM Panel 3604970233G (effective date January 30, 2015), the Site is not located within a 100-year flood zone; therefore, this does not represent an environmental concern for the Site. A copy of the flood insurance map for the Site area is included in *Appendix E*.

Stormwater is collected from catch basins located on paved areas of the Site and the surrounding streets and is conveyed into the NYCDEP combined storm/sanitary sewer system.

3.2.5 Radon

Radon is a colorless, odorless radioactive gas that results from the natural breakdown of uranium minerals in soil, rock, and water, which subsequently enters the atmosphere. It can concentrate in buildings, entering through cracks and other penetrations of a building foundation. Some areas are more likely to have elevated concentrations of radon than others, reflecting subsurface lithologic conditions.

The New York State Department of Health (NYSDOH) maintains a database of radon test results on a local and county level. According to the NYSDOH, 527 radon tests have been conducted in basements in Queens County. The average radon level was found to be 1.20 picoCuries per liter (pCi/L). According to Federal Area Radon Information presented in the EDR report (*Appendix I*), radon concentrations were tested at 81 locations in Queens County. The average radon concentration in Queens County, New York was 0.620 pCi/L in living areas tested and 0.970 pCi/L in basements tested. In addition, Queens County is in United States Environmental Protection Agency (USEPA) Radon Zone 3, where the indoor average radon level is less than 2 pCi/L. These results are below the USEPA Action Level of 4.0 pCi/L; therefore, STV concludes that it is unlikely that elevated levels of radon gas are present at the Site.

4.0 ADJOINING AND SURROUNDING PROPERTIES

The area surrounding the Site is primarily characterized low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR. The following table summarizes the adjoining site uses:

Direction	Facility Name/Description	Street Address/Location	Current Use
North	Industrial/ Manufacturing	104-32 Merrick Blvd. 104-28 Merrick Blvd. 104-22 Merrick Blvd. 104-12 Merrick Blvd. 104-10 Merrick Blvd. 104-02 Merrick Blvd.	Parking Lot RVM Wheels Vacant Manufacturing Facility Vacant Manufacturing Facility Vacant Manufacturing Facility Vacant Manufacturing Facility
East	Merrick Blvd. followed by Transportation/Utility and Parking and Retail Gasoline Sales	Merrick Blvd. 104-15 Merrick Blvd. 104-19 Merrick Blvd. 105-09 Merrick Blvd. 105-15 Merrick Blvd.	Public Street Sports Line Auto Repairs Auto repair facility (parking) Inter City Tire (truck tire center) BP Gas Station
South	Commercial Office, Parking, Mixed-Use Res/Commercial, and Transportation /Utility followed by 107th Avenue	105-12 Merrick Blvd. 105-14 Merrick Blvd. 105-22 Merrick Blvd. 106-04 Merrick Blvd. 107th Avenue	Parking Lot Parking Lot Deli (closed) and Residences First World Auto/Calvin Auto Body Public Street
West	Transportation/Utility	165-18 South Road	Jamaica Bus Depot

Based on our inspection of the adjacent and surrounding properties, the following off-site RECs/VECs were identified:

- Several auto repair facilities are located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- One (1) active gasoline filling station is located in the area surrounding the Site. This property is considered a REC/VEC based on its proximity to the Site.

5.0 HISTORICAL USE RESEARCH

5.1 Land Title Records and Tax Records

STV researched prior ownership information for the Site at the New York City Department of Finance (DOF) website. In addition, prior ownership information was researched through EDR's Environmental Lien Search and the New York City Department of Buildings (NYCDOB) Automated City Register Information System (ACRIS) on-line website. The subject property is currently owned by "George Williams". Based on the research, this entity has owned the Site since at least 1982. No environmental liens were identified for the Site. All prior ownership information reviewed is presented in *Appendix J*.

5.2 Historical USGS Topographic Quadrangles

STV reviewed available historical USGS Topographic Quadrangles for information regarding past uses of the Site and surrounding area. Topographic maps for the Brooklyn quadrangle were obtained for the following years: 1900 and 1924. Topographic maps for the Jamaica quadrangle were obtained for the following years: 1947, 1957, 1966, 1979, and 1994. The following table presents descriptions and interpretations from historical USGS topographic map review.

Year (Scale and Quadrangle)	Comments
1900 (1:62,500) Brooklyn	**Site:** The Site appears to be located amongst developed streets. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** Surrounding properties appear to be located amongst developed streets. The Long Island Railroad (LIRR) tracks are depicted to the north of the Site. A pond is depicted west-southwest of the Site on the south side of the LIRR tracks. The area a few blocks south of the Site appears as undeveloped land with only a few roadways present, rail lines, and a pond and wetlands area. Due to scale of the map, no further information can be obtained.
1924 (1:62,500) Brooklyn	**Site:** No significant changes are apparent to the Site property from the 1900 topographic map. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** No significant changes are apparent to the Site property from the 1900 topographic map. Due to scale of the map, no further information can be obtained.
1947 (1:25,000) Jamaica	**Site:** The Site is shown with one structure fronting Merrick Boulevard. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** The areas north, east, south, and west of the Site have been significantly developed with streets and structures. A long building is depicted northwest of the Site on the same block. Prospect Cemetery is identified west of the Site on the south side of the LIRR tracks where a pond was previously depicted. The Jamaica Station is located west-northwest of the Site. Water Supply Company Tank No. 2 is located east of the Site. Baisleys Pond is depicted several blocks south of the Site. The Contagious Disease Hospital and Queens General Hospital are located northwest of the Site on the south side of Union Turnpike.
1957 (1:24,000) Jamaica	**Site:** Elevation contour lines are depicted on the map and show the Site is approximately 30 feet amsl. No structure is depicted on the Site. No other significant changes are apparent to the Site property from the 1947 topographic map. **Surrounding Properties:** An Armory is identified several blocks north of the Site on the north side of the LIRR tracks. Water pumping stations are located east and south of the Site. A water tower is depicted west of Site in the immediate vicinity of Prospect Cemetery. The LIRR Hillside Support Facility is depicted to the east of the Site. St. Albans Naval Hospital is located southeast of the Site. No other significant changes are apparent to the surrounding properties from the 1947 topographic map.

Year (Scale and Quadrangle)	Comments
1966 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1957 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1957 topographic map.
1979 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1966 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1966 topographic map except the water tower that was west of Site near Prospect Cemetery is no longer depicted.
1994 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1979 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1979 topographic map.

Based on STV's review of historical topographic maps, the Site appears to be amongst developed streets as early as 1900. No evidence of filling was noted on the Site property. The Site property was previously developed with at least one structure. Potential buried structures from former buildings on the Site property could contain a UST and/or historic fill materials of unknown origin, and is considered a REC/VEC with respect to the Site. The Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site. The review of historical USGS Topographic Quadrangles did not indicate RECs, CRECs, HRECs, or VECs at the surrounding areas. Copies of historical USGS Topographic Maps are included in *Appendix F*.

5.3 Historical Aerial Photographs

STV reviewed historical aerial photographs of the Site and surrounding areas provided by EDR in order to identify historical land use that may have involved hazardous substances and petroleum products. Aerial photographs were obtained for the following years: 1924, 1951, 1954, 1961, 1966, 1975, 1984, 1994, 2006, 2009, and 2011. The following table summarizes descriptions and interpretations from the historical aerial photograph reviews:

Year	Comments
1924 1" – 500'	**Site:** The Site appears to be developed with a large structure. Due to the scale of the photograph, no further details can be discerned. **Surrounding Properties:** The areas adjacent to the Site to the east and south appear to be developed with multiple structures. The area north of the Site appears to be developed with a structure. A long building is visible northwest of the Site on the same block. Railroad tracks are depicted to the north. Due to scale of the photograph, no further details can be discerned.
1951 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1924 aerial photograph. **Surrounding Properties:** The areas adjacent to the Site to the east and south appear to be developed with multiple structures. The area north of the Site appears to be developed with a structure. A long building is visible directly northwest of the Site on the same block. Railroad tracks are depicted to the north. A large water tank is located south of the Site. Due to scale of the photograph, no further details can be discerned. No other significant changes are discernible to the adjacent and surrounding properties from the 1924 aerial photograph.
1954 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1951 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1951 aerial photograph.

Year	Comments
1961 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1954 aerial photograph. **Surrounding Properties:** A vacant lot and/or parking lot north of the Site appears to be developed with a structure. Some of the structures south of the Site on the same block are gone and the area appears to be used as storage for truck trailers or cargo containers. Two water tanks are located south of the Site. No other significant changes are discernible to the adjacent and surrounding properties from the 1954 aerial photograph.
1966 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1961 aerial photograph. **Surrounding Properties:** More the structures south of the Site on the same block are gone and the area appears to be used as storage for truck trailers or cargo containers. No other significant changes are discernible to the adjacent and surrounding properties from the 1961 aerial photograph.
1975 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1966 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1966 aerial photograph.
1984 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1975 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1975 aerial photograph.
1994 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1975 aerial photograph. The image is of poor quality. **Surrounding Properties:** The structures on the block south of the Site's block are gone and the area appears to be vacant. No other significant changes are discernible to the adjacent and surrounding properties from the 1975 aerial photograph. The image is of poor quality.
2006 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1994 aerial photograph. **Surrounding Properties:** A large building complex has been constructed on the block south of the Site's block. No other significant changes are discernible to the adjacent and surrounding properties from the 1994 aerial photograph.
2009 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2006 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2006 aerial photograph.
2011 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2009 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2009 aerial photograph.

The review of historical aerial photographs did not indicate RECs, CRECs, HRECs, or VECs at the Site or surrounding areas. Copies of reproducible historical aerial photographs are included in *Appendix G*.

5.4 Historical Fire Insurance Maps (Sanborn® Maps)

A search for historical fire insurance maps for the Site and adjoining properties was conducted by EDR. These maps were obtained for the following years: 1891, 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006. The following table presents descriptions and interpretations from historical fire insurance map review.

Year	Comments
1891	**Site:** The Site is not depicted on the map. **Surrounding Properties:** Properties to the northwest include residential dwellings and sheds.
1901	**Site:** The Site is depicted as vacant land. **Surrounding Properties:** Surrounding properties include residential dwellings, sheds, a hotel, a polling place, a **blacksmith,** and a **sign painting shop**. A large tract of vacant land is located immediately west of the Site.

Year	Comments
1912	**Site:** The Site is depicted with a structure labeled 'vacant'. No other significant changes have occurred to the Site from the 1901 map. **Surrounding Properties:** Several more residential dwellings have been developed in the areas north, east, south, and west of the Site. The **sign painting shop** is no longer depicted to the north-northeast of the Site across Merrick Blvd. No other significant changes have occurred to the adjacent and surrounding properties from the 1901 map.
1926	**Site:** The structure labeled 'vacant' is gone and Site is depicted with a larger structure at the western end of the property, a portion of a residential dwelling, and a commercial structure fronting Merrick Blvd. No other significant changes have occurred to the Site from the 1912 map. **Surrounding Properties:** Several residential dwellings have been developed on the blocks northeast and west of the Site. An **auto painting facility** is located to the north-northeast of the Site across Merrick Blvd. and a **sign painting shop** is located to the north of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1912 map.
1951	**Site:** The portion of the residential dwelling is gone. The property is now developed with a large structure on the western side labeled 'junk', two sheds, and the commercial structure fronting Merrick Blvd. No other significant changes have occurred to the Site from the 1926 map. **Surrounding Properties:** A commercial structure labeled '**paints**' is located immediately adjacent to the north. Two **iron works**, two **auto repair facilities**, a **lacquer paint shop**, and two **gasoline filling stations** are located to the north of the Site on the same block. An **auto body repair shop** and a **gasoline filling station** are located to the east of the Site across Merrick Blvd. A **gasoline filling station**, **carpet cleaner**, and **auto repair and paint shop** are located to the south of the Site. The New York City Transit System Service Station and Garage is located to the west of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1926 map.
1981	**Site:** The former structures on the Site are gone. The property is now developed with one large structure that covers the majority of the footprint of the Site. No other significant changes have occurred to the Site from the 1951 map. **Surrounding Properties:** A structure immediately north of the Site is now labeled '**auto parts mfg**'. A building labeled '**salvage depot**' is located to the north of the Site. A **print shop** and two **auto repair facilities** are located east of the Site. A **truck repair sh**op is located to the southeast of the Site. The two **gasoline filling stations** to the north of the Site and the **gasoline filling station** south of the Site are no longer depicted. The residential dwellings and other structures located at the southern end of the Site block are gone and the area is labeled 'bus parking'. No other significant changes have occurred to the adjacent and surrounding properties from the 1951 map.
1982	**Site:** No significant changes have occurred to the Site from the 1981 map. **Surrounding Properties:** The **carpet cleaner** located to the south of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1981 map.
1986	**Site:** No significant changes have occurred to the Site from the 1982 map. **Surrounding Properties**: A **junk yard** is depicted to the east of the Site along 106th Avenue. No other significant changes have occurred to the adjacent and surrounding properties from the 1982 map.
1988-1993	**Site:** No significant changes have occurred to the Site from the 1986 map. **Surrounding Properties**: The **junk yard** is no longer depicted beginning in 1991. An **auto repair facility** is depicted at the southeast corner of Merrick Blvd. and 104th Avenue beginning in 1993. No other significant changes have occurred to the adjacent and surrounding properties from the 1986 map.
1995	**Site:** No significant changes have occurred to the Site from the 1993 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1993 map.

Year	Comments
1996	**Site:** No significant changes have occurred to the Site from the 1995 map. **Surrounding Properties:** An **auto repair and wash facility** is depicted to the north of the Site on the same block. No significant changes have occurred to the adjacent and surrounding properties from the 1995 map.
1999	**Site:** No significant changes have occurred to the Site from the 1996 map. **Surrounding Properties:** The **gasoline filling station** located to the east of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1996 map.
2001-2006	**Site:** No significant changes have occurred to the Site from the 1999 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1999 map.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the Site:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the surrounding areas:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Several current auto repair facilities and one retail gasoline filling station were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

Copies of the historical fire insurance maps are provided in *Appendix H*.

5.5 City Directories

A review of historical city directories for the Site and surrounding areas was conducted by EDR. The following table presents descriptions and interpretations from the historical city directory reviews.

Year	Comments
1922	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1934	**Site:** The Site address was listed for residential listings. **Surrounding Properties:** Surrounding properties included residential listings and a bakery.
1939	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a **junk yard**, **auto repairs**, an **auto painting shop**, a **gasoline filling station,** and the Dry Steam Appliance Co.
1945	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, an auto parts store, a **home heating oil service**, and a **gasoline filling station**.

Year	Comments
1950	**Site:** The Site address was listed for residential listings. **Surrounding Properties:** Surrounding properties included residential listings, offices, liquor store, a garage, a grocery, a tavern, a tool and die company, a **printing company**, an **iron works**, a **home heating oil service**, a **gasoline filling station**, and a nursing home.
1962	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and an electronics corporation.
1967	**Site:** The Site address was listed for a kitchen cabinet manufacturing company. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and a **gasoline filling station**.
1970	**Site:** The Site address was listed for a furniture store. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1976	**Site:** The Site address was listed for a furniture store. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1983	**Site:** The Site address was listed for an appliance repair shop. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1991	**Site:** The Site address was listed for an appliance repair shop and a barbeque restaurant. **Surrounding Properties:** Surrounding properties included residential listings**, auto body shops,** and Rocket Sewer Service.
1996	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
2000	**Site:** The Site address was listed for an appliance repair shop. **Surrounding Properties:** Surrounding properties included residential listings, a **printing company**, **auto body shops**, and a daycare facility.
2005	**Site:** The Site address was listed for an appliance repair shop and Dominos Pizza. **Surrounding Properties:** Surrounding properties included residential listings, a **printing company**, **auto body shops**, an auto wrecking facility, a furniture store.
2008	**Site:** The Site address was listed for an appliance repair shop, Dominos Pizza, and an export company. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and a storage facility.
2013	**Site:** The Site address was listed for an appliance repair shop, Dominos Pizza, and **Ralke Auto Repairs**. **Surrounding Properties:** Surrounding properties included residential listings, the **Hadco Metal Trading Co**., **auto body shops**, a medical office, a **printing company**, restaurants, and Caribbean Heating Corp.

The review of the historical city directories revealed the presence of the following RECs and VECs at the Site:

- The historic use of a portion of the Site as an auto repair facility is considered a REC/VEC.

The review of historical city directories revealed the presence of the following RECs and VECs at the surrounding areas:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard,

and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

Copies of the historical city directories are provided in *Appendix J.*

5.6 Prior Reports

STV reviewed a *Phase I ESA for Eight Properties Near Jamaica Bus Depot*, dated February 17, 2012. The report was prepared by STV on behalf of MTA NYCT. The properties are located in the Borough of Queens, New York, including Lots 41, 53, 60, 61, 63, 66, 68, and 72 within Block 10164. The Phase I ESA identified RECs in connection with the properties addressed as 103-16 Merrick Boulevard and 103-30 Merrick Boulevard. These properties historically including an auto repair shop and filling stations with gasoline storage tanks. Additionally, an existing product plume at the Site and adjacent properties is considered a REC. Finally, based on open spills, undocumented tightness testing and known subsurface contamination, the Jamaica Bus Depot and BP Service Station #11009 represent RECs. The Phase I ESA revealed environmental concerns associated with the Site including suspect ACM, LBP on interior and exterior painted surfaces, suspect PCBs, and water staining and mold growth.

The report concluded that NYCT has performed extensive soil and groundwater investigations, including post-remediation sampling, at the Jamaica Bus Depot from approximately 2002 to the present. Based on the ongoing environmental monitoring being administered under NYSDEC Global Consent Order, active pump and treat remediation system, and numerous sub-surface environmental investigations that have been performed at the Jamaica Bus Depot, a Phase II Environmental Site Investigation (ESI) was not required. Based on the review of this existing information, recommendations were provided for engineering controls to be implemented during future site development. At a minimum, the following remedial actions and/or engineering controls are required to render the Site suitable for use:

1. Prior to any site redevelopment, a geophysical survey should be performed to determine if any underground storage tanks (USTs) are present at 103-16 Merrick Boulevard, 103-30 Merrick Boulevard and any other potential excavation locations. Additionally, in the event that a UST is discovered, an evaluation should be made at that time of the need for any additional investigation to determine whether soil and/or groundwater has been adversely impacted more than is currently documented.
2. As a safeguard to prevent potential volatile organic compounds in soil vapor from entering the new building in the future, a soil vapor barrier should be integrated into the new building design.
3. All material excavated during construction activities should be properly characterized and disposed, including collection and analysis of additional samples if required by the contractor-selected disposal facilities.
4. After the proposed new building and grounds are constructed, any exposed soil (landscaped areas) must be covered with at least two feet of environmentally clean fill.
5. Suspect ACM, LBP, PCB-containing materials and/or mold encountered during construction or excavation should be properly identified and managed.

5.7 Other Historical Sources

In 2012, STV was provided with several previous environmental reports pertaining to the area adjacent to the Site - the NYCT Jamaica Depot located at 165-18 South Road, Jamaica, Queens, NY. URS Corporation (URS) is currently providing environmental engineering services for the Jamaica Bus Depot in conjunction with NYCT's UST program. The work is being administered under NYSDEC Global Consent Order CO2-20000101-3341 dated May 2001. NYCT has been operating a pump and treat

remediation system to recover a combined heating oil and diesel fuel release since 1995 at the Jamaica Bus Depot. NYSDEC spill #9010039 was initially reported on December 14, 1990 and continues to be an open case, along with several other spills that occurred consequently. Numerous investigations have been performed at the Jamaica Bus Depot by URS to evaluate the extent of product in the sub-surface and all possible in-situ remedial measures to address petroleum-impacted soil and groundwater. These are as follows:

- Soil Investigation Report, October 2002. This investigation consisted of the advancement of five soil borings within the plume and collecting soil samples to determine the presence and vertical extent of petroleum-impacted soil beneath the water table. This study was prompted by NYCDEP's intention to re-activate the Jamaica Water Supply wells for regional dewatering in 2007 which could lower the water table by as much as 16 feet. The study concluded that product releases likely occurred when the water table was depressed during the previous operation of the Jamaica water supply system (pre-1996). However, soil impacts when compared with cleanup objectives were insignificant.
- Site-Specific Investigation Work Plan (SSIWP), May 2004. A soil and groundwater investigation was conducted in 2003 to determine the levels to which product had impacted soils relative to NYSDEC TAGM soil cleanup objectives, the results of which were reported in this SSIWP. Six borings were advanced with soil samples and groundwater samples were collected from nearby wells. The results imply that free product and the associated petroleum contaminants detected in soils were not significantly impacting dissolved-phase groundwater quality. The SSWIP also discussed the feasibility of bioremediation at the Jamaica Depot.
- Feasibility of Enhanced Product Recovery through Site-Wide Groundwater Depression, May 2004. This feasibility study (FS) was prompted by NYSDEC correspondence to URS dated April 29, 2004 that suggested that the product recovery system be enhanced or redesigned to increase product recovery through a significant increase in the pumping rate to overcome the rise in groundwater levels. The FS consists of dewatering calculations to determine the capacity of a remediation system capable of lowering the water table in the depot area by five feet. The pumping rate was estimated on the higher end of the range from 400 to 4,000 gpm, based on operating data from the existing system. The FS also stated that the product plume was currently trapped beneath the water table but was stable and not migrating.
- Site-Specific Remedial Plan (SSRP) for In-Situ Bioremediation Investigation, October 2004. In-situ enhanced bioremediation was recommended as the only feasible technology for soil remediation, considering the site constraints. Implementation would be done through the injection of a slurry of oxygen-releasing material in the subsurface. An investigation was performed in June 2004 to support this recommendation and thus acquire site-specific information pertaining to existing microbiologic conditions within and outside of the historic limits of the free product plume. Two borings were advanced (GP-7 and GP-8) near existing monitoring wells (W-10 and W-25) and samples were collected for both, respectively.
- Site-Specific Remedial Plan and Remedial Design (SSRP/RD) for Enhancing Product Recovery, March 2005. The SSRP/RD was designed to address the fact that effective in-situ technologies to treat trapped product are limited. At a meeting with NYSDEC and NYCT on February 25, 2005, one potential approach was identified utilizing the full capacity of a single extraction well for recovery in of product in that area. The SSRP/RD was approved in a letter dated May 5, 2005 by the NYSDEC for the use of one well (PW-4) to pump 170 gallons per minute (gpm) in order to lower the water table by four feet in an area extending 20-25 feet from the extraction point. If the design is successful, it will be utilized at a later date to address the rest of the plume.
- Remediation Analytical Data, 2008-2011. Groundwater quality is being monitored during remediation at the Jamaica Depot, as well as groundwater and product levels.

5.8 Historical Use Interviews

No other historical sources were available for interview.

6.0 REGULATORY AGENCY RECORD REVIEWS

The databases discussed in this section, provided by EDR, were reviewed for information regarding documented and/or suspected releases of regulated hazardous substances and/or petroleum products on or near the Site (*Appendix I*). STV also reviewed the "unmappable" (also referred to as "orphan") listings within the database report, cross-referencing available address information and facility names. Unmappable sites are listings that cannot be plotted with confidence, but are identified as being located within the general area of the Site based on the partial street address, city name, or zip code. In general, a listing cannot be mapped due to inaccurate or incomplete address information in the database that was supplied by the corresponding regulatory agency. Any listings from the unmappable summary which were identified by STV as a result of the area reconnaissance and/or cross-referencing to mapped listings are included in the corresponding database discussion within this section.

6.1 Federal and State Regulatory Agency Database Reviews

A review of federal and state records for the Site was accomplished by contacting offices of Federal and State regulatory agencies and review of the regulatory listings compiled in the regulatory agency database report (*Appendix I*). The results of the review of the Federal and State records are presented below. Copies of the correspondences are included in *Appendix K*.

United States Environmental Protection Agency (USEPA)
The USEPA is responsible for protecting human health and the environment. To that end, the USEPA develops and enforces regulations that implement environmental laws enacted by Congress. A Freedom of Information Law (FOIL) request dated October 1, 2015 was filed with the USEPA to determine if the agency holds additional records pertaining to the Site property. USEPA acknowledged the request on October 1, 2015. At the time this report was issued, STV had not yet received any further responses from USEPA. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

The status of the Site was also checked on USEPA's MyPropertyInfo website on September 30, 2015. A search of the databases did not locate any environmental records. A copy of the MyPropertyInfo result is included in *Appendix K*.

New York State Department of Environmental Conservation (NYSDEC)
The NYSDEC maintains files of incidents involving environmentally regulated materials, spill incidents, and state regulated cleanups. The records maintained by NYSDEC include reports of spills of hazardous chemicals and petroleum, petroleum bulk storage information, and site-specific environmental data. NYSDEC information concerning the Site property was requested in a FOIL records access application dated October 1, 2015. NYSDEC acknowledged the request on October 2, 2015. NYSDEC sent a response email dated October 13, 2015, indicating that no records have been located for the Site.

New York State Department of Health (NYSDOH)
The NYSDOH Records Access Office maintains files of health-related environmental incidents in the State of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYSDOH information concerning the Site property was requested in a formal letter dated September 30, 2015. NYSDOH acknowledged the request on September 30, 2015. NYSDOH sent a response letter dated October 23, 2015, indicating that no records have been located for the Site.

A summary of sites identified through the Federal and State regulatory agency database review is provided in the following table:

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
National Priorities List for Federal Superfund Cleanup (NPL)	03/26/2015	1 mile	0	No	No
Delisted NPL Site List	03/26/2015	1 mile	0	No	No
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), including CERCLIS NFRAP Sites	10/25/2013	½ mile	0/0	No	No
Resource Conservation and Recovery Information System – Corrective Action Activity (RCRIS CORRACTS) and Non-CORRACTS Treatment, Storage, or Disposal Facilities (RCRIS-TSD)	06/09/2015	1 mile / ½ mile	0/0	No	No
Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)	06/09/2015	¼ mile	1/1/3	No	**Yes**
RCRA Non-Generator	06/09/2015	¼ mile	14	No	**Yes**
Federal Institutional Control/Engineering Control Registries	06/09/2015	½ mile	0/0	No	No
Emergency Response Notification System (ERNS)	06/22/2015	Site	NA[1]	No	No
State Toxic Release Inventory System (TRIS)	12/31/2013	¼ mile	0	No	No
Hazardous Substance Waste Disposal Site Inventory (HSWDS)	01/01/2003	½ mile	0	No	No
New York State Inactive Hazardous Waste Disposal Sites (SHWS)	08/17/2015	1 mile	3	No	No
Solid Waste Management Facilities Sites (SWF/LF)	06/24/2015	½ mile	13	No	**Yes**
Vapor Reopened	11/01/2014	1 mile	1	No	No
New York State Spills Information (NY Spills)/Leaking Underground Storage Tanks (LTANKS)	08/17/2015	½ mile 1/8 mile	19/31	No	**Yes**
Petroleum Bulk Storage Tanks (USTs/ASTs)	07/29/2015	¼ mile	6/11	No	**Yes**
NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)	01/01/2002	¼ mile	0/1	No	**Yes**
NY Chemical Bulk Storage Tanks (NY CBS)	07/29/2015	¼ mile	2	No	**Yes**
Historic Bulk Storage Tanks (USTs/ASTs)	01/01/2002	¼ mile / Site	1/0	No	**Yes**
New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)	08/17/2015	1 mile	0/1	No	No
E-Designation Site (E)	05/27/2015	1/8 mile	31	**Yes**	**Yes**

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
Registered Dry Cleaners	07/02/2015	½ mile	0	No	No
EDR US Hist Auto Stat	NA	¼ mile	39	**Yes****	**Yes**
EDR US Hist Cleaners	NA	½ mile	1	No	**Yes**
NY Manifest	08/01/2015	¼ mile	20	No	**Yes**
NJ Manifest	12/31/2013	¼ mile	4	No	**Yes**
RI Manifest	12/31/2013	¼ mile	1	No	**Yes**
Manufactured Gas Plant Sites (Coal Gas)	NA[2]	1 mile	1	No	No

* The surrounding area search radius indicates the radial area (measured from the perimeter of the Site) for which the database review was performed.
** The Site address is listed in the search results but the Site is not identified as the target property.
[1]NA – Not Applicable
[2] This database consists of a compilation of historic resources (as early as the late 1800s) prepared by EDR that does not require updates. The last MGP in New York State ceased operations in 1972.

The Site is listed in the E-Designation and EDR US Hist Auto Stat databases. The following subsections provide a discussion of the listings that have been identified within the search radii and are in the table above:

National Priorities List of Federal Superfund Cleanup (NPL)
The NPL is a subset of the CERCLIS, and lists properties that are ranked as high priority for cleanup under the federal Superfund program. Neither the Site nor any other facility within one mile of the Site is listed in the NPL Site List.

Delisted NPL Site List
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the USEPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425 (e), sites where no further response is appropriate may be deleted from the NPL. Neither the Site nor any other facility within one mile of the Site is listed in the Delisted NPL Site List.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
The CERCLIS list is a compilation of known and suspected uncontrolled or abandoned hazardous waste sites which are, or were, under investigation by USEPA but have not been elevated to the status of a Superfund (NPL) site. Former CERCLIS sites that have been granted the status of No Further Remedial Action Planned (NFRAP) are also included in the database. Neither the Site nor any other facility within one-half mile of the Site is listed in the CERCLIS or CERCLIs NFRAP databases.

Resource Conservation and Recovery Information System (RCRIS) – Treatment, Storage, or Disposal Facilities (TSD) and RCRIS Corrective Action Activity (CORRACTS)
The RCRA program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRIS database tracks facilities that treat, store, and/or dispose of hazardous waste as defined by RCRA (referred to as TSD facilities). The RCRIS CORRACTS database identifies TSD facilities that have conducted, or are currently conducting, corrective action(s) as regulated under RCRA.

Neither the Site nor any other facility within one mile of the Site is listed in the RCRIS CORRACTS database and neither the Site nor any other facility within one-half mile of the Site is listed in the RCRIS-TSD database.

Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)
This list includes operations that generate or transport hazardous waste for which a hazardous waste generator identification number or transporter permit is required. The RCRIS Gen/Trans listing is merely a listing of all facilities that, due to the amount of hazardous waste generated, are required to register with the USEPA for tracking purposes, but are not necessarily those with reported contamination incidents. The Site was not listed in the RCRIS Gen/Trans database.

One (1) RCRA Large Quantity Generator (RCRA-LQG) was listed within a one-quarter mile radius of the Site. Based on its distance from the Site and lack of reported violations, this RCRA-LQG listing is not anticipated to have affected the environmental integrity of the Site.

One (1) RCRA Small Quantity Generator (RCRA-SQG) was listed within a one-quarter mile radius of the Site. The following RCRA-SQG facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
R&S Parts & Service Inc. dba Strauss Auto 168-08 Liberty Avenue Jamaica, NY 11433	769-ft/North	Up-gradient	K92	EPA ID: NYD980758080. The Site is also listed on the NY Manifest database. Facility generates spent halogenated solvents.

Three (3) RCRA Conditionally Exempt Small Quantity Generators (RCRA-CESQG) were listed within a one-quarter mile radius of the Site. The following RCRA-CESQG facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCTA 165-18 South Road Jamaica, NY 11433	570-ft/Northwest	Cross-gradient	H74	EPA ID: NYD980642268. The Site is also listed on the US AIRS, NJ Manifest, and RI Manifest databases. Facility generates cadmium, lead, and waste oils and has listed violations associated with its operations.

Based on their distance from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow direction, the other RCRA-CESQG listings are not anticipated to have affected the environmental integrity of the Site.

Resource Conservation and Recovery Information System Non-Generators / No Longer Reporting (RCRA NonGen / NLR)
RCRAInfo is USEPA's comprehensive information system, providing access to data supporting the RCRA of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous

waste as defined by the RCRA. Non-Generators do not presently generate hazardous waste. The Site is not listed in the RCRA NonGen / NLR database.

Fourteen (14) RCRA NonGen / NLR facilities were identified within a one-quarter mile radius of the Site. The following RCRA NonGen / NLR facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	759-ft/North-northwest	Up-gradient	J89	EPA ID: NYD986903763. The Site is also listed on the NY Manifest database. The facility is a retail gasoline filling station.
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	189-ft/East-southeast	Down-gradient	B17	EPA ID: NYD981874407. The Site is also listed on the NY Manifest database.
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	349-ft/East-southeast	Cross-gradient	B42	EPA ID: NYD987030012. The Site is also listed on the NY Manifest database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.

None of the other RCRA Non/Gen /NLR listings are anticipated to have affected the environmental integrity of the Site, based on their distances from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow directions.

Federal Institutional Control/Engineering Control Registries

The Federal Institutional Control/Engineering Control Registries are listings of sites with engineering controls and/or institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining at a site. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or affect human health. Neither the Site nor any other facility within one-half mile of the Site is listed in the Federal Institutional Control/Engineering Control Registries.

Emergency Response Notification System (ERNS)

The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances. The Site is not listed in the ERNS database.

New York State Toxic Release Inventory System (TRIS)

The Toxic Release Inventory System (TRIS) is a database used to collect information and report releases of toxic chemicals to the air, water, and land in reportable quantities. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the TRIS database.

Hazardous Substance Waste Disposal Site Inventory (HSWDS)

The list includes any known or suspected hazardous substance waste disposal sites. Also included are sites delisted from the Registry of Inactive Hazardous Waste Disposal Sites and non-Registry sites that USEPA Preliminary Assessment (PA) reports or Site Investigation (SI) reports were prepared. Hazardous Substance Waste Disposal Sites are eligible to be Superfund sites. The sites on the list will not automatically be made Superfund sites; rather each site will be further evaluated for listing on the Registry. Neither the Site nor any other facility within one-half mile of the Site is listed in the HSWDS database.

New York State Inactive Hazardous Waste Disposal Sites (SHWS)

The New York State Inactive Hazardous Waste Disposal Sites database, compiled by the NYSDEC, maintains information regarding the investigation and cleanup of suspected hazardous waste sites. The Site is not listed in the SHWS database.

Three (3) SHWS facilities were listed within a one-mile radius of the Site. Based on their distances from the Site (greater than one-quarter mile) and/or inferred down-gradient groundwater flow direction, these SHWS facilities are not anticipated to have affected the environmental integrity of the Site.

Solid Waste Management Facilities Sites (SWF/LF)

The SWF/LF database is a comprehensive listing of State permitted/recorded solid waste management facilities. The Site is not listed in the SWMF database.

Thirteen (13) SWF/LF facilities were listed within a one-half mile radius of the Site. The following SWF/LF facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Taylor Auto Collision 104-21 Merrick Blvd. Jamaica, NY 11433	296-ft/North	Up-gradient	D24	The Site was engaged in vehicle dismantling. The Site is inactive.
Junk Yard International 169-09 Liberty Avenue Jamaica, NY 11433	932-ft/North-northeast	Up-gradient	M105	The Site was engaged in vehicle dismantling. The Site is inactive.
S&S Super Sports Auto Care Inc. 94-40 Merrick Blvd. Jamaica, NY 11433	1,036-ft/North-northwest	Up-gradient	N115	The Site was engaged in vehicle dismantling. The Site is inactive.

Based on their distances from the Site and/or inferred down-gradient groundwater flow direction, the other SWF/LF facilities are not anticipated to have affected the environmental integrity of the Site.

Vapor Reopened

New York is currently re-evaluating previous assumptions and decisions regarding the potential for soil vapor intrusion exposures at sites. As a result, all past, current, and future contaminated sites will be evaluated to determine whether these sites have the potential for exposures related to soil vapor intrusion. The Site is not listed in the Vapor Reopened database.

One Vapor Reopened facility was listed within a one-mile radius of the Site. The facility is identified as West Side Corp., and is located 3,407-ft east of the Site at 107-10 180th Street. This facility is also listed

in the NY UST and Historical UST databases. The site contains soil vapor and contaminated groundwater above guidance values. Based on its distance from the Site and/or inferred down-gradient groundwater flow direction, this Vapor Reopened listing is not anticipated to have affected the environmental integrity of the Site.

New York State Spills Information Database (NY Spills)/Leaking Underground Storage Tanks (LTANKS)
The NY Spills database, including LTANKS sites, was researched to identify listings within one-half mile of the Site. The database search identified 19 reported NY Spills and 31 LTANKS incidents within one-half mile of the Site. The Site is not listed in the NY Spills/LTANKs databases.

The following NY Spills / LTANKS facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	570-ft/Northwest	Cross-gradient	H73	Spill No. 9010039 was reported on 12/14/90. The spill was the result of a tank test failure. The spill is not closed. There are known petroleum-impacted soils and groundwater. NYCT has been operating a pump and treat system since 1995.

Based on distance from the Site combined with the assumed hydraulic relationship and/or the nature of the incident/regulatory status, none of the other facilities located within one-half mile of the Site identified in the NY Spills/LTANKS databases are expected to impact the environmental integrity of the Site.

Petroleum Bulk Storage Tanks (USTs/ASTs)
The NYSDEC PBS tank database was researched to identify listings for the Site and adjacent properties. The PBS Tank database is a listing of all facilities that are required to register their storage tanks for tracking purposes and not necessarily those with reported contamination incidents. The Site is not listed in the PBS tank database.

A total of 17 facilities (6 UST sites and 11 AST sites) were identified within one-quarter mile from the Site. The following UST facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BHELA 105-15 Merrick Blvd. Jamaica, NY 11433	85-ft/East-northeast	Up-gradient	A14	PBS No. 2-601509. The Site is an active retail gasoline filling station. The site has three (3) 4,000-gallon gasoline USTs and one (1) 4,000-gallon diesel UST. The Site is also listed on the NY AST database.

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	570-ft/Northwest	Cross-gradient	H69	PBS No. 2-190225. The site has five (5) 4,000-gallon diesel USTs and five (5) 4,000-gallon biodiesel UST. There are two (2) 15,000-gallon #6 fuel oil USTs and twelve (12) 2,000-gallon diesel USTs that are closed-in-place. There are two (2) 15,000-gallon #2 fuel oil USTs that are temporarily out-of-service. The site has a history of spills with one open spill case.
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	759-ft/North-northwest	Up-gradient	J90	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-gallon #2 fuel oil UST that are all closed-in-place.

Based on distance from the Site, assumed hydraulic relationship, the lack of known releases with the potential to affect the Site, and/or current regulatory status, none of the other facilities identified within one-quarter mile of the Site in the PBS database are expected to impact the environmental integrity of the Site.

NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)

The NYSDEC chemical bulk storage (NY CBS UST/AST) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS UST/AST database lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons and/or in underground tanks of any size. The Site was not identified on the NY CBS UST/AST database.

One facility was listed within one-quarter mile of the Site. This NY CBS UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	570-ft/Northwest	Cross-gradient	H75	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS, and NY Spills databases.

NY Chemical Bulk Storage (NY CBS)

The NYSDEC chemical bulk storage (NY CBS) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons. The Site was not identified on the NY CBS database.

Two (2) facilities were listed within one-quarter mile of the Site. The following facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	570-ft/Northwest	Cross-gradient	H75	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Based on its distance from the Site, the other NY CBS listing is not anticipated to have affected the environmental integrity of the Site.

Historical Bulk Storage Tanks (USTs/ASTs)

These facilities have petroleum bulk storage capabilities in excess of 1,100 gallons and less than 400,000 gallons. This database contains detailed information per site. This database is no longer updated. More current data is presented in the PBS UST/AST databases. The Site is not listed in the HIST UST/AST databases.

The database identified the presence of one (1) historic UST facility located within one-quarter mile of the Site. This HIST UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	759-ft/North-northwest	Up-gradient	J90	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-gallon #2 fuel oil UST that are all closed-in-place.

New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)

The Voluntary and Brownfield remedial programs involve mostly private entities and private funds to remediate contaminated sites and return the properties to productive use. The NYSDEC VCP/BCP database was researched to identify listings for the Site and within a one-mile radius of the Site. The Site is not listed in the VCP/BCP databases.

One (1) BCP facility is listed within one mile of the Site. Based on its distance from the Site and/or inferred down-gradient groundwater flow direction, this BCP listing is not anticipated to have affected the environmental integrity of the Site.

E-Designation Site Listing (E-Designation)
The E (Environmental) Designation would ensure that sampling and remediation take place on the subject properties, and would avoid any significant impacts related to hazardous materials at these locations. The E-designations require that the owner of the sites conduct testing and sampling following set protocols, to the satisfaction of city agencies. In addition, the owner must remediate when appropriate. The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing for the Site for hazardous materials is considered to be a REC/VEC.

The database identified thirty-one (31) E-Designation listings within a one-eighth-mile radius of the Site. The listings are associated with E-designation reference No. E-39 (Underground Gasoline Storage Tanks Testing Protocol) and E-175 (Underground Gasoline Storage Tanks Testing Protocol). The listed sites are all considered as RECs/VECs with respect to the Site.

Registered Dry Cleaners
The NYSDEC registered dry cleaners database was researched to identify listings within one-quarter mile of the Site. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the dry cleaners database.

EDR Exclusive Historic Auto Stations (EDR US Hist Auto Stat)
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is listed in the EDR US Hist Auto Stat database under the 105-02 Merrick Boulevard address but this listing is not identified as the target property in the EDR search results. This listing is considered an onsite REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
105-02 Merrick Blvd. Jamaica, NY 11433	Target Property	NA	A5	Identified as Garvey's Auto Repair and Ralke Auto Repairs. Listed for years 1999, 2000, 2011, and 2012.

The database search identified 38 other listings within one-quarter mile of the Site. The EDR Hist Auto Stat facilities that are considered RECs/VECs with respect to the Site are as follows:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
105-09 Merrick Blvd. Jamaica, NY 11433	72 feet/ East-northeast	Cross-gradient	A11	Identified as Inter City Tire Corp. Listed for year 2006.

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
105-17 Merrick Blvd. Jamaica, NY 11433	72 feet/ East-northeast	Cross-gradient	A12	Identified as Fred's Auto Repair. Listed for year 2002.
105-15 Merrick Blvd. Jamaica, NY 11433	72 feet/ East-northeast	Cross-gradient	A13	Identified as Citgo Gas Station and Henrys Repair Shop. Listed for years 1999-2001.
104-28 Merrick Blvd. Jamaica, NY 11433	275 feet/ North	Cross-gradient	D22	Identified as AAA Transmissions & Engines. Listed for years 2004, 2005, and 2009.
104-21 Merrick Blvd. Jamaica, NY 11433	300 feet/ North	Up-gradient	D26	Identified as Taylor Auto Collision Inc. Listed for years 1999-2002, 2004-2009, and 2011.
104-19 Merrick Blvd. Jamaica, NY 11433	306 feet/ North	Up-gradient	D27	Identified as Full Line Auto Repairs. Listed for years 1999-2001, 2003-2007, and 2009-2012.
104-15 Merrick Blvd. Jamaica, NY 11433	319 feet/ North	Up-gradient	D31	Identified as Dynamic Autoworks Inc., Ace Auto Body & Truck Repair, Jimmy's Trans & Auto Repair, and Sports Line Auto Repair. Listed for years 1999-2005, 2008, 2010, and 2012.
104-13 Merrick Blvd. Jamaica, NY 11433	325 feet/ North	Up-gradient	D33	Identified as Full Line Auto Repairs. Listed for year 2002.
104-09 Merrick Blvd. Jamaica, NY 11433	338 feet/ North	Up-gradient	D38	Identified as Junior Auto Collision, RJS Car Care Center Inc., L&C Auto Collision, NASCAR Auto Body Inc., and Integrity Collision & Towing. Listed for years 2001-2012.
103-16 Merrick Blvd. Jamaica, NY 11433	515 feet/ North-northwest	Cross-gradient	G61	Identified as The Car Doctor and Breeze Auto Collision & Repair. Listed for years 1999-2001 and 2003.
106-04 Merrick Blvd. Jamaica, NY 11433	189 feet/ East-southeast	Down-gradient	A17	Identified as Birds Auto Repair. Listed for years 1999-2012.
106-03 Merrick Blvd. Jamaica, NY 11433	197 feet/ East	Down-gradient	B16	Identified as Truck Repair Services. Listed for years 2011 and 2012.
107-17 Merrick Blvd. Jamaica, NY 11433	524 feet/ East-southeast	Down-gradient	F63	Identified as E&D Auto Seat Cover, Dave's Precision Auto Service Inc., Inspection City Auto Repair Inc., and Haldane Auto Service. Listed for years 1999-2008 and 2010-2012.
107-35 Merrick Blvd. Jamaica, NY 11433	643 feet/ Southeast	Down-gradient	F78	Identified as Mystique Auto Body Works Corp. Listed for years 1999-2002, 2004, 2005, and 2009.

Due to their distances from the Site and/or the presumed groundwater flow direction none of the other EDR Hist Auto Stat facilities are considered RECs/VECs with respect to the Site.

EDR Exclusive Historic Dry Cleaners (EDR US Hist Cleaners)

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is not listed in the EDR US Hist Cleaners database.

The database search identified one (1) listing within one-half mile of the Site. This facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
107-37 166th Street Jamaica, NY 11433	728 feet/ South-southeast	Down-gradient	I87	Identified as ABD Cleaners Corp. Listed for year 2009.

NY Manifest

The NY Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the NY Manifest database.

Twenty (20) NY Manifest facilities were identified within one-quarter mile of the Site. The following NY Manifest facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	759-ft/North-northwest	Up-gradient	J89	EPA ID: NYD986903763. The Site is also listed on the RCRA NonGen / NLR database. The facility is a retail gasoline filling station.
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	189-ft/East-southeast	Down-gradient	B17	EPA ID: NYD981874407. The Site is also listed on the RCRA NonGen / NLR database.
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	349-ft/East-southeast	Cross-gradient	B42	EPA ID: NYD987030012. The Site is also listed on the RCRA NonGen / NLR database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NY Manifest facilities are expected to impact the environmental integrity of the Site.

NJ Manifest

The NJ Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the NJ Manifest database.

Four (4) NJ Manifest facilities were identified within one-quarter mile of the Site. The following NJ Manifest facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCT 165-18 South Road Jamaica, NY 11433	570- ft/Northwest	Cross-gradient	H74	The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NJ Manifest facilities are expected to impact the environmental integrity of the Site.

RI Manifest

The RI Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the RI Manifest database.

One (1) RI Manifest facility was identified within one-quarter mile of the Site. The following RI Manifest facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCT 165-18 South Road Jamaica, NY 11433	570- ft/Northwest	Cross-gradient	H74	The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Manufactured Gas Plant Sites (Coal Gas)

Manufactured gas sites were used in the United States from the 1800's to the 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water and produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils, and other compounds are potentially hazardous to human health and the environment. The byproducts were frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination. The Manufactured Gas Plant (MGP) Sites database was researched to identify any listings for the Site and within a one-mile radius of the Site. The Site is not listed in the MGP database.

One (1) facility within one mile of the Site is listed in the MGP database. The facility is identified as Jamaica Gas and Light and is located approximately 3,042-ft west of the Site at Beaver Road and 158th Street. Due to its distance from the Site and/or the presumed groundwater flow direction this facility is not considered a REC/VEC with respect to the Site.

Orphan Listings
A review of the Orphan Listings in the database search report indicated a total of four (4) listings. The Orphan sites are not considered RECs based on their estimated distances from the Site (none adjacent or on the Site block) and/or the nature of the activity/release.

6.2 Local Regulatory Agency Research

A review of local records for the Site was accomplished by contacting offices of New York City regulatory agencies including the NYCDOB, NYCDEP, Department of Health and Mental Hygiene (NYCDOHMH), NYCDCP, and the Fire Department (FDNY). The results of the review of local records are presented below. Copies of the correspondences are included in *Appendix K*.

New York City Department of Buildings (NYCDOB)
NYCDOB records were reviewed on November 13, 2015 to determine whether there are references to buildings, tanks or other structures, property use or inspection reports that indicate the presence, past use, or release of hazardous substances, wastes, or petroleum products at the Site. The NYCDOB records review indicated that the Site has two (2) NYCDOB violations, both of which were dismissed. There were no RECs identified as a result of review of NYCDOB records. Copies of the NYCDOB records are included in *Appendix J*.

New York City Department of Environmental Protection (NYCDEP)
The NYCDEP maintains files of incidents involving environmentally regulated materials. The records maintained by NYCDEP include reports of spills of hazardous chemicals and citizen's complaints on environmental issues. NYCDEP information concerning the Site was requested in a formal application for records dated October 1, 2015. At the time this report was issued, STV had not yet received a response from NYCDEP. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of Health and Mental Hygiene (NYCDOHMH)
The NYCDOHMH, Bureau of Environmental Investigations (BEI) maintains files of health-related environmental incidents in the City of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYCDOHMH information concerning the Site was requested in a formal FOIL request form dated October 1, 2015. NYCDOHMH acknowledged the request on October 6, 2015. At the time this report was issued, STV had not yet received any response from NYCDOHMH. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of City Planning (NYCDCP)
STV reviewed the NYCDCP Zoning Map 14d, available via the NYCDCP on-line web-site. According to the map, the Site is currently located within zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

"E" designations for blocks or lots on city zoning maps were issued since approximately March 2003 and indicate that potential environmental issues are associated with these parcels. The environmental issues may or may not be associated with potential contamination by hazardous or petroleum substances. Parcels with "E" designations require that the fee owner of the site conduct a testing and sampling protocol, and remediation where appropriate, to the satisfaction of the New York City Office of

Environmental Remediation (NYCOER) before the issuance of a building permit by the NYCDOB pursuant to the provisions of Section 11-15 of the Zoning Resolution (Environmental Requirements).

The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing for the Site for hazardous materials is considered to be a REC/VEC.

New York City Fire Department (FDNY)

The FDNY maintains information concerning petroleum USTs. STV submitted a Fuel Oil Record Search Request Form to the FDNY on October 1, 2015 for information concerning the Site. At the time this report was issued, STV had not yet received a response from FDNY. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

7.0 USER RESPONSIBILITIES

7.1 Environmental Liens or Activity and Use Limitations

An Environmental Lien Search Report was obtained from EDR for the Site. The Environmental Lien Search Report provides results from a search of available and current land title records for environmental liens and other activity and use limitations, such as engineering controls and institutional controls. A review of the report indicates that no environmental liens or other activity and use limitations were found for the Site. A copy of the environmental lien search report is included in *Appendix J*.

7.2 Valuation Reduction for Environmental Issues

No information was available at the time of the assessment regarding the relationship of the purchase price of the property to the fair market value of the property. If information is received regarding valuation reduction for environmental issues which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.3 Knowledge or Experience of the User

No person with specialized knowledge or experience that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.4 Commonly Known or Reasonably Ascertainable Information

No person within the local community with commonly known or reasonably ascertainable information about the property that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.5 The Degree of Obviousness of the Presence or Likely Presence of Contamination at the Property

NYCT is not currently aware of any obvious indicators that point to the presence or likely presence of new or imminent releases at the property. Additionally, NYCT is not currently aware of any obvious indicators important to the screening of VECs in connection with the property.

8.0 SITE RECONNAISSANCE AND INTERVIEWS

8.1 Methodology and Limiting Conditions

The inspection of the Site included observations of the property and surrounding area (Site reconnaissance) that were made to identify potential sources or indications of hazardous substances, including: ASTs; USTs; tank vents and fill ports; transformers and other items that could contain PCBs; waste storage areas; hazardous materials usage, storage, and disposal; stained surfaces and soils; stressed vegetation; leaks; and, odors. In addition, readily-observable portions of the properties immediately adjacent to the Site were viewed from public rights-of-way to identify or determine the likelihood of any of the aforementioned potential sources of contamination being present. There were no limiting conditions with respect to impact on the accuracy of the Site reconnaissance.

8.2 Site Reconnaissance

Mr. Doane Cafferty of STV performed the Site visit on November 12, 2015. A request for access to the Site was communicated in a letter dated October 27, 2015 that was mailed to Mr. George Williams (the property owner) and Fearonce G. La Lande, Esq. (Mr. William's attorney). At the time this visit was conducted, STV had not yet received a response from either Mr. Williams or Mr. La Lande. Consequently, the site inspection was conducted from the public sidewalk in front of the Site. At the time of the inspection, the weather was approximately 50º F with sunny skies. The weather did not prevent STV from conducting a thorough inspection of the Site and surrounding areas. *Appendix C* provides representative photographs of the Site.

Block 10164, Lot 79 is an approximately 8,800 square-foot (sf) property that contains a one-story building constructed in 1937. The building has two units. The front unit is currently occupied by a Dominos Pizza franchise and the back unit is currently occupied by an appliance repair shop.

The Site is bound to the north by a parking lot followed by a custom wheel, tire, and rim supply and repair shop and subsequently by several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south by bus depot parking lots, a mixed-use residential/commercial building, an auto collision repair shop, and subsequently 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street.

8.3 Current and Historical Use Interviews

The following knowledgeable persons were interviewed with regard to the Site pursuant to ASTM 1527-13 Section 10:

8.3.1 Current Property Owner

The subject property is currently owned by 'George Williams'. Based on the research, this entity has owned the Site since at least 1982. All prior ownership information reviewed is presented in *Appendix J*. The review of current and historical ownership and tax records information did not reveal evidence of RECs or VECs associated with prior use of the Site.

8.3.2 Current Site Operator or Key Site Manager

Name	Title/Company	Years Associated with Site
Mr. George Williams	Owner	~33

Detailed information provided during the above-listed interview is documented on Record of Communication forms in *Appendix K*.

8.3.3 Site Occupants

Other than the Owner's representative, Site occupants were not available to interview during this assessment.

8.3.4 Past Owners, Operators and Occupants

Past owners or occupants of the Site were not available to interview during this assessment. STV was unable to obtain contact information from any previous owners or occupants.

8.3.5 Report User

Name	Title/Company	Years Associated with Site
Mr. Emil Dul	NYCT Real Estate Department	<1

According to the ASTM E 1527-13 User Questionnaire provided by Mr. Emil Dul of NYCT Real Estate Department, NYCT is not aware of any environmental liens, land use limitations, specialized knowledge, or past uses of the Site. Detailed information provided during the above-listed interviews is referenced in applicable sections of this report and a copy of the completed ASTM E1527-13 User Questionnaire is included in *Appendix K*.

8.4 Hazardous Substances and Petroleum Products Storage and Handling

8.4.1 Hazardous Substances

No hazardous substances were stored or located on the Site within view from the sidewalk areas. There was no visual or olfactory evidence of leakage or staining anywhere on the Site that was visible from the sidewalk areas. STV concludes that storage and handling of hazardous substances do not presently represent a REC or VEC for the Site.

8.4.2 Petroleum Products Storage and Handling

No evidence of petroleum product storage was observed at the Site within view from the sidewalk areas. STV concludes that storage and handling of petroleum products do not presently represent a REC or VEC for the Site.

8.5 Solid Waste Generation, Storage and Disposal

No containers for solid waste were observed on the Site. Solid waste generation, storage, and disposal are not considered a REC or a VEC with respect to the Site.

8.6 Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are toxic components of various products including, but not limited to caulking materials, light ballasts, and dielectric and hydraulic fluids that were formerly used in electrical equipment such as transformers and hydraulic elevators/lifts. The manufacture and use of PCBs was banned in the United States in 1978.

STV did not observe any electrical transformers on or adjacent to the Site. Potential buried structures, historic fill, fluorescent lighting fixtures, and window caulking on the property could include PCB-containing materials and is considered an environmental concern with respect to the Site.

8.7 Asbestos-Containing Material (ACM)

STV conducted a limited visual survey (i.e., within accessible areas only) for the presence of suspect ACM within the Site. The intent of the survey was to identify exposed suspect ACM through preliminary non-destructive observations. No sampling of suspect ACM was performed during this investigation. Pursuant to applicable asbestos control regulations and guidelines, STV considered any observed suspect materials to be asbestos-containing.

Based on the age of the Site building (circa 1937), there is the potential for the presence of suspect ACM.

8.8 Lead-Based Paint (LBP) Survey

During the Site inspection, a limited visual assessment of all accessible painted surfaces was performed. No sampling or intrusive work was performed as this is outside the scope of work of this assessment. All painted surfaces are assumed to be LBP.

Based on the age of the Site building (circa 1937), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.

8.9 Regulatory Compliance

STV does not consider regulatory compliance to be an environmental concern for the Site.

8.10 Electromagnetic Fields

A visual inspection was performed for the presence of high voltage power lines and or substations located in close proximity to the Site. No such power lines or substations were identified; therefore, STV does not consider electromagnetic fields to be an environmental concern at the Site.

8.11 Other Environmental Concerns (Methane, Mold, etc.)

Based on a review of the historic topographic map and knowledge of the area, the Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site.

As part of this assessment, STV conducted a limited assessment for the presence of water damage and odors, indicative of the potential for mold growth, on accessible surfaces within the Site. There was no evidence of water damage or mold noted during the Site inspection.

9.0 SUMMARY OF FINDINGS

The Site is located at 105-02 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 79). Block 10164, Lot 79 is an approximately 8,800 square-foot (sf) property that contains a one-story building constructed in 1937. The building has two units. The front unit is currently occupied by a Dominos Pizza franchise and the back unit is currently occupied by an appliance repair shop.

The Site is bound to the north by a parking lot followed by a custom wheel, tire, and rim supply and repair shop and subsequently by several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south by bus depot parking lots, a mixed-use residential/commercial building, an auto collision repair shop, and subsequently 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street.

NYCDCP Zoning Map 14d indicated the Site is designated as zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol).

The Site is generally flat and the topography of the surrounding area slopes to the south-southeast. According to the USGS 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, and information contained in the regulatory agency database report, the Site elevation is approximately 30 feet amsl.

The nearest surface water body is a pond in Captain Tilly Park, located approximately 4,600 feet north-northwest of the Site. Based on topography, the groundwater flow in the area of the Site is assumed to be south-southwest towards Jamaica Bay. The depth to groundwater is estimated to range from approximately 20-25 feet bgs.

The Phase I ESA identified on-Site RECs pertaining to potential buried structures from former buildings that could contain underground storage tanks and/or historic fill materials of unknown origin; the historic use of a portion of the Site as an auto repair facility; and the Site's listing with an E-Designation for underground storage tanks testing protocol.

Off-site RECs include three solid waste management facilities; a nearby facility with an open spill; one facility that currently generates spent halogenated solvents; one facility that historically generated cadmium, lead, and waste oils; an active gas station; several historical and current auto repair facilities; one historic dry cleaner; several nearby properties with E-Designation listings for underground storage tanks testing protocol; and the historical presence of a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs in close proximity to the Site. The Phase I ESA revealed environmental concerns associated with suspect ACM, LBP, PCB-containing materials.

10.0 CONCLUSIONS AND RECOMMENDATIONS

STV has performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527-13 and the requirements of NYCT. Any additions to, exceptions to, or deletions from this practice are described in Section 2.0 of this report.

The Phase I ESA has revealed the following RECs, CRECs, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The historic use of a portion of the Site as an auto repair facility is considered a REC/VEC.

  The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that generates spent halogenated solvents is located in close proximity to the Site and is considered a REC/VEC.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- A facility with an open spill is located northwest of the Site at 165-18 South Road. This property is considered a REC/VEC based on its proximity to the Site and hydraulically cross-gradient position with respect to the Site.

- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Based on the age of the Site building (circa 1937), there is the potential for the presence of suspect ACM.
- Based on the age of the Site building (circa 1937), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.
- Potential buried structures, historic fill, fluorescent lighting fixtures, and window caulking may contain PCBs.

Recommendations

STV recommends that any ACM, LBP, and/or PCB-containing materials affected by future renovations, repairs or demolition at the Site be identified and properly managed during such activities. If the NYCT considers purchasing the property in the future, or if future development requires soil disturbance, a comprehensive Phase II Environmental Site Investigation should be conducted.

11.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

STV Incorporated (STV) has performed a Phase I ESA of the property located at 105-02 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 79). The scope of the Phase I ESA was consistent with the requirements of ASTM Standard Practice E 1527-13 and of NYCT. Signatures of the Environmental Professionals who participated in conducting this Phase I ESA are provided below. Qualifications for these individuals are provided in *Appendix L*. STV declares that to the best of their professional knowledge and belief, they meet(s) the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. STV has the specific qualifications based on education, training and experience to assess the subject property. STV has developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Prepared By:
Doane E. Cafferty, LEED AP BD+C
Senior Environmental Scientist

Reviewed By:
Christine Vilardi, P.G., LEED Green Associate
Quality Control Officer

Reviewed By:
Peter S. Helseth, P.E.
Senior Project Manager

12.0 REFERENCES

Persons Interviewed:

- Mr. George Williams, Owner, 105-02 Merrick Blvd., Jamaica, Queens, New York, DATE TBD.

Resources Consulted:

- EDR – Radius Map™ Report with GeoCheck®, September 29, 2015.
- EDR – Historical Sanborn® Maps: 1891, 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006.
- EDR – Aerial Photographs: 1924, 1951, 1954, 1961, 1966, 1975, 1984, 1994, 2006, 2009, and 2011.
- EDR – USGS Historical Topographic Maps: 1900, 1924, 1947, 1957, 1966, 1979, and 1994.
- EDR – City Directories: 1922, 1934, 1939, 1945, 1950, 1962, 1967, 1970, 1976, 1983, 1991, 1996, 2000, 2005, 2008, and 2013.
- EDR - Environmental Lien Search dated September 30, 2015.
- NYC Department of Finance – Assessment Roll: 2006-2015.
- Oasis Website - www.oasisnyc.net/OASISMap.htm.
- FEMA Map Services Center Website - www.msc.fema.gov
- National Wetlands Inventory Website - www.fws.gov/nwi/
- USGS New York Water Science Center http://ny.ims.er.usgs.gov/li-dtw/ and http://ny.ims.er.usgs.gov/LI_maps06

Regulatory Agencies Contacted:

- New York City Department of Buildings, October 1, 2015.
- New York City Fire Department, October 1, 2015.
- New York City Planning and Zoning Department, October 1, 2015.
- New York City Department of Environmental Protection, October 1, 2015.
- New York City Department of Health and Mental Hygiene, October 1, 2015.
- New York State Environmental Conservation, October 1, 2015.
- New York State Department of Health, October 1, 2015.
- Unites States Environmental Protection Agency, October 1, 2015.

Documents and Maps:

- ASTM International (ASTM) 2013, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," ASTM Designation E 1527-13.
- ASTM E 2600-10 "Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions."
- STV Potential Property Acquisition Eight Properties Near Jamaica Bus Depot, Jamaica, New York, dated February 17, 2012.
- U.S. Geological Survey, Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, Charles Baskerville, 1994. USGS I 2306.
- U.S. Geological Survey, Groundwater in Bronx, New York and Richmond Counties with Summary Data on Kings and Queens Counties, New York City, New York, Nathaniel Perlmutter and Theodore Arnow, 1953. USGS 6W-32.

- Water Supply Paper 2498 (USGS 1999) Ground-Water Resources of Kings and Queens Counties, Long Island, New York by Herbert Buxton and Peter Schernoff.
- USGS LI Depth-to Water Tool for Long Island (USGS, 2013).

13.0 APPENDICES

Appendix A - Site Location Map
Appendix B - Site Plan
Appendix C - Site Photographs
Appendix D - National Wetlands Inventory Map
Appendix E - FEMA Flood Insurance Rate Map
Appendix F - Historical Topographic Maps
Appendix G - Historical Aerial Photographs
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Appendix I - Regulatory Agency Database Report
Appendix J - Supporting Documents
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Appendix L - Qualifications of Environmental Professionals

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Phase I ESA - 105-22 Merrick Boulevard

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PHASE I ENVIRONMENTAL SITE ASSESSMENT
OF

105-22 MERRICK BOULEVARD
BLOCK 10164, LOT 89
JAMAICA, QUEENS, NEW YORK 11433

CONTRACT NO.: CM-1411/D-61162
TASK ORDER NO.: 24
CONSULTANT PROJECT NO.: 30-17749-0001

AUGUST 24, 2016

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1.0 EXECUTIVE SUMMARY

At the request of New York City Transit (NYCT), STV Incorporated (STV) conducted a Phase I Environmental Site Assessment (ESA) of the property located at 105-22 Merrick Boulevard, Jamaica, Queens, New York 11433 (hereafter referred to as the "Site"). The legal description of the Site is Block 10164, Lot 89. NYCT is evaluating the feasibility of acquiring the Site for the Jamaica Bus Depot reconstruction.

Block 10164, Lot 89 is an approximately 2,000 square-foot (sf) property that contains a three-story building constructed in 1931. The ground floor was formerly occupied by a delicatessen and is currently vacant. The second and third floors are occupied by residential dwellings. The Site is owned by "Elna L Lewis" according to the Environmental Data Resources (EDR) Environmental Lien Search. Historically, the Site was occupied a ground level storefront with residential dwellings on the upper floors. The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

The main objective of the Phase I ESA is to identify *recognized environmental conditions (RECs)* and environmental concerns that may affect the suitability of the Site for acquisition and redevelopment. RECs are defined in ASTM International (ASTM) Standard Practice E 1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property. Note that *controlled recognized environmental conditions (CRECs)* are considered to be RECs and are listed in the Executive Summary and Conclusions of this Phase I ESA. Additionally, *vapor encroachment conditions (VECs)* were evaluated as per ASTM E 2600-10.

Other environmental issues and conditions that, in the opinion of the *environmental professional* conducting the assessment, would not be considered *RECs* are identified in this assessment. These may include *historical RECs* and/or *de minimis* conditions. The Phase I ESA also includes a preliminary evaluation of specific potential environmental issues or conditions that are, according to ASTM E 1527-13, considered non-scope considerations. These issues include radon, asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing light ballasts and caulking materials, exterior lead-based paint (LBP), chemical storage, wetlands, regulatory compliance issues, dry cleaner and other industrial emissions, mold, biological agents, electromagnetic fields, and methane. The Phase I ESA included a review of Federal, State, and local records, previous reports and historical documents; visual observation of the Site and adjoining properties; and, interviews with selected Site representatives.

The assessment requested by NYCT is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included evaluation of the following: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-site solid waste management and disposal practices; on-site hazardous materials and petroleum products management; chemical storage, ACM, PCBs and exterior LBP management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions; radon; mold and moisture intrusion; biological agents; electromagnetic fields; and, potential for methane generating materials.

Summary of RECs, CRECs, VECs and Environmental Concerns

This Phase I ESA has revealed the following RECs, CRECS, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The historic use of the Site as an upholstery shop is considered a REC/VEC.
- The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.
- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.
- One (1) facility that generates spent halogenated solvents is located in close proximity to the Site and is considered a REC/VEC.
- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.
- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.
- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.
- A facility with an open spill is located northwest of the Site at 165-18 South Road. This property is considered a REC/VEC based on its proximity to the Site and hydraulically cross-gradient position with respect to the Site.
- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.
- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect ACM.

- Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.
- Potential buried structures, historic fill, fluorescent lighting fixtures, and window caulking may contain PCBs.

STV recommends that any ACM, LBP, and/or PCB-containing materials affected by future renovations, repairs or demolition at the Site be identified and properly managed during such activities. If the NYCT considers purchasing the property in the future, or if future development requires soil disturbance, a comprehensive Phase II Environmental Site Investigation should be conducted.

2.0 INTRODUCTION

This report summarizes the results of the Phase I Environmental Site Assessment (ESA) of the property located at 105-22 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 89) (hereafter referred to as the "Site"). Block 10164, Lot 89 is an approximately 2,000 square-foot (sf) property that contains a three-story building constructed in 1931. The ground floor was formerly occupied by a delicatessen and is currently vacant. The second and third floors are occupied by residential dwellings. NYCT is evaluating the feasibility of acquiring the Site for the Jamaica Bus Depot reconstruction.

The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

Mr. Doane Cafferty of STV performed the Site visit on November 12, 2015. A request for access to the Site was communicated in a letter dated October 27, 2015 that was mailed to Mr. Henry Lewis. At the time this visit was conducted, STV had not yet received a response Mr. Lewis. Consequently, the site inspection was conducted from the public sidewalk in front of the Site. The weather was approximately 50º F with sunny skies; there were no limitations caused by the weather.

2.1 Selected Definitions

The following terms are used throughout this report and, for the purpose of clarity, corresponding definitions are provided. These terms are fully defined in ASTM E 1527-13 and ASTM E 2600-10.

Controlled Recognized Environmental Condition (CREC) – A recognized environmental condition resulting from a past *release* of *hazardous substances* or *petroleum products* that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority) with *hazardous substances* or *petroleum products* allowed to remain in place subject to the implementation of required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Historical Recognized Environmental Condition (HREC) – A past *release* of any *hazardous substances* or *petroleum products* that occurred in connection with the *property* and has been addressed to the satisfaction of the applicable regulatory authority, without subjecting the *property* to any required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Recognized Environmental Condition (REC) – The presence or likely presence of any *hazardous substances* or *petroleum products* in, on, or at a *property:* (1) due to any *release* to the *environment*; (2) under conditions indicative of a *release* to the *environment*; or, (3) under conditions that pose a *material threat* of a future *release* to the *environment*.

Environmental Professional - A person meeting the education, training, and experience requirements as set forth in 40 CFR § 312.10(b), necessary to conduct a *site reconnaissanc*e, *interview*s, and other activities in accordance with this practice, and from the information generated by such activities, having the ability to develop opinions and conclusions regarding conditions indicative of releases or threatened

releases on, at, in, or to a property, sufficient to meet the objectives and performance factors in 40 CFR § 312.20(e) and (f).

Vapor Encroachment Condition (VEC) - The presence or likely presence of chemical of concern vapors in the subsurface of the target property caused by the release of vapors from contaminated soil or groundwater or both either on or near the target property.

2.2 Purpose and Scope

The purpose of this assessment is to identify RECs, CRECs, VECs, and certain other environmental issues or concerns as they existed at the Site at the time of the Site visit. The assessment is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser, or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included, but was not limited to an assessment of the following potential environmental issues: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-Site solid waste management and disposal practices; on-Site hazardous materials and petroleum products management; asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing equipment and lead-based paint (LBP) management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions, radon, mold and moisture intrusion; biological agents; electromagnetic fields; and the potential for methane generating materials.

This evaluation was conducted by qualified *environmental professionals* utilizing a standard of good commercial and customary practice in accordance with ASTM E 1527-13. The scope of work completed for this evaluation meets all requirements of ASTM E 1527-13 and includes the following:

- Documenting the physical characteristics of the Site through a review of available topographic, geologic, wetland, flood plain, groundwater data and Site observations.

- Researching the Site history through a review of reasonably ascertainable standard sources such as land deeds, fire insurance maps, city directories, aerial photographs, prior reports and interviews.

- Documenting current Site conditions, via observations and interviews, regarding the presence or absence of hazardous substances/petroleum products; the generation, treatment, storage, or disposal of hazardous, regulated, or medical wastes; the presence of electrical equipment that utilizes oils which potentially contain PCBs; and, the presence of storage tanks (above and below ground), floor drains, drains that discharge to subsurface, former septic tanks and drywells.

- Determining the usage of adjoining and nearby properties to identify the likelihood for environmental conditions (if present and/or suspected) and concerns to migrate onto the Site.

- Evaluating information contained within Federal and State environmental databases and other local environmental records, within specific search distances.

2.3 Additions, Deviations, Deletions, Data Failures, and Data Gaps

The following environmental issues that are outside the scope of (additions to) ASTM E 1527-13 were evaluated:

- A review of available radon data for the Site vicinity.
- A review of available wetlands data.
- A visual assessment for water damage and mold.
- A visual assessment for suspect ACM.
- A visual assessment for suspect LBP.
- An assessment of potential methane generation on-Site or migration to the Site.
- Regulatory compliance.
- PCB light ballasts and caulking materials.
- Biological agents (mold, pigeon guano, medical wastes, etc.).
- Air emissions from drycleaners and other industrial sources.
- An assessment of the potential presence of electromagnetic fields (EMF).
- An assessment of any dust generating activities on or near the Site.

The following deviations, data gaps and deletions from ASTM E 1527-13 were necessary in conducting this assessment:

- The Site area history was not conducted in five-year intervals. However, sufficient information about the history of the Site and surrounding area could be obtained from the available historical fire insurance maps, aerial photographs, city directories, and local records and this data gap is not likely to alter the conclusions of this report.
- The Site reconnaissance was conducted from the sidewalk area in front of the Site because access was not granted by the owner or a representative of the owner at the time of the inspection.

2.4 Limitations and Exceptions

STV has prepared this Phase I ESA using reasonable efforts in each phase of its work to identify RECs associated with hazardous substances, wastes and petroleum products at the Site. The methodology of the Phase I ESA was consistent with the ASTM E 1527-13. Findings within this report are based on information collected from observations made on the day of the Site investigation and from reasonably ascertainable information obtained from governing public agencies and private sources.

This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation, or other construction purposes. STV makes no representation or warranty that the past or current operations at the Site are or have been in compliance with all applicable Federal, State and local laws, regulations and codes.

Regardless of the findings stated in this report, STV is not responsible for consequences or conditions arising from facts that were concealed, withheld, or not fully disclosed at the time the evaluation was conducted.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The regulatory database report provided is based on an evaluation of the data collected and compiled by a contracted data research company. The report focuses on the Site and neighboring properties that could impact the Site. Neighboring properties listed in governmental environmental records are identified within specific search distances. The search distance varies depending upon the particular government

record being checked. The regulatory research is designed to meet the requirements of ASTM E 1527-13. The information provided in the regulatory database report is assumed to be correct and complete.

3.0 SITE DESCRIPTION

3.1 Site Location and Legal Description

The Site is located at 105-22 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 89). Block 10164, Lot 89 is an approximately 2,000 square-foot (sf) property that contains a three-story building constructed in 1931. The ground floor was formerly occupied by a delicatessen and is currently vacant. The second and third floors are occupied by residential dwellings.

The Site is located in the Jamaica neighborhood of Queens. The Site is "E" designated according to the New York City Department of City Planning (NYCDCP) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). A map showing the location of the Site is presented in *Appendix A*. A Site Plan showing the Site's physical layout including adjacent land use is presented in *Appendix B*. Photographs of the Site and surrounding areas are included in *Appendix C*.

The Site is bound to the north by bus depot parking lots followed by a one-story commercial office building and subsequently by a parking lot, custom wheel, tire, and rim supply and repair shop and several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south an auto collision repair shop and subsequently 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street. No changes to the Site were observed since the most recent Sanborn Map (2006).

The surrounding area is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR.

According to information obtained through the New York City Department of City Planning (NYCDCP) website, the Site is currently located within zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

3.2 Physical Setting

3.2.1 Topography

According to the United States Geological Survey (USGS) 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, the elevation of the Site is approximately 28 feet above mean sea level (amsl). The topography of the immediate Site area was observed to be sloping to the south-southeast. A copy of the topographic map is presented in *Appendix A*.

3.2.2 Geology

The geology of Queens County can be characterized as a wedge-shaped layer of Cretaceous and Pleistocene unconsolidated sediments, thickening to the south-southeast. Several impermeable clay layers are found within this sediment package, generally creating three distinct aquifers. Consolidated crystalline bedrock is of Precambrian age. The thickness of the unconsolidated sequence ranges from zero to approximately 1,300 feet below ground surface (bgs) from north to south. The southernmost portions of

Queens, including portions of the Rockaways, consist of glaciofluvial sediments derived from melt-water of the retreating glaciers. Depth to bedrock within the vicinity of the Site is at least 600 feet bgs (as per "Ground-Water Resources of Kings and Queens Counties, Long Island, New York, by Herbert Buxton and Peter Schernoff, dated 1999).

3.2.3 Soils

According to the GeoCheck Section of the regulatory agency database report (*Appendix I*), the soil in the area of the Site is described as Urban Land. Urban Land refers to soils that have been altered by human activities thus making them unidentifiable. Typically, these soils have been mixed with other materials, such as brick and concrete (urban fill), and characteristics can only be determined by on-site investigation. Other surficial soil types in the area of the Site consist of silt loam, loamy sand, sandy loam, and fine sandy loam. Sandy loam refers to a soil that's made of sand, silt, and clay.

3.2.4 Hydrology

Generally, groundwater contour lines mimic the surface topography and groundwater flow direction is perpendicular to these contour lines flowing from higher to lower elevation. According to USGS digital elevation data provided by Environmental Data Resources, Inc. (EDR) of Milford, Connecticut (*Appendix I*) and the USGS 7.5-minute Quadrangle map, *Jamaica, NY*, 2013, groundwater in the vicinity of the Site is inferred to flow to the south-southwest towards Jamaica Bay. According to "Water Table Altitude in Kings and Queens Counties, New York in March 1997" (USGS, 1997) depth to groundwater is anticipated to range from approximately 20 to 25 feet bgs. Estimated groundwater levels and/or flow direction(s) may vary due to seasonal fluctuations in precipitation, local usage demands, geology, underground structures, or dewatering operations. The groundwater in the vicinity of the Site is not known to be used for human consumption, as most potable water in the area is derived from upstate reservoirs managed by New York City; the Site area is serviced by the City water supply.

STV did not observe any retention ponds or other surface water bodies on the Site. The nearest surface water body is a pond in Captain Tilly Park, located approximately 4,600 feet north-northwest of the Site. Another pond, Baisley Pond, is located approximately 1.36 miles south of the Site. Bergen Basin, an inlet off Jamaica Bay, is located approximately 3.0 miles south-southwest of the Site.

STV reviewed the United States Fish and Wildlife Service National Wetlands Inventory (NWI) map for the area of the Site (http://www.fws.gov/wetlands/data/index.html) to determine if the Site is located in a regulated wetlands area. Based on a review of the map, the Site is not located within a regulated wetlands area. A copy of the wetlands map is included in *Appendix D*.

The Federal Emergency Management Agency (FEMA) Region II Coastal Analysis and Mapping Preliminary Flood Maps & Data website (http://www.region2coastal.com/view-flood-maps-data/view-preliminary-flood-map-data/) was reviewed to assess whether the Site is located within a designated flood plain or flood zone. According to the revised preliminary FIRM Panel 3604970233G (effective date January 30, 2015), the Site is not located within a 100-year flood zone; therefore, this does not represent an environmental concern for the Site. A copy of the flood insurance map for the Site area is included in *Appendix E*.

Stormwater is collected from catch basins located on paved areas of the Site and the surrounding streets and is conveyed into the NYCDEP combined storm/sanitary sewer system.

3.2.5 Radon

Radon is a colorless, odorless radioactive gas that results from the natural breakdown of uranium minerals in soil, rock, and water, which subsequently enters the atmosphere. It can concentrate in buildings, entering through cracks and other penetrations of a building foundation. Some areas are more likely to have elevated concentrations of radon than others, reflecting subsurface lithologic conditions.

The New York State Department of Health (NYSDOH) maintains a database of radon test results on a local and county level. According to the NYSDOH, 527 radon tests have been conducted in basements in Queens County. The average radon level was found to be 1.20 picoCuries per liter (pCi/L). According to Federal Area Radon Information presented in the EDR report (*Appendix I*), radon concentrations were tested at 81 locations in Queens County. The average radon concentration in Queens County, New York was 0.620 pCi/L in living areas tested and 0.970 pCi/L in basements tested. In addition, Queens County is in United States Environmental Protection Agency (USEPA) Radon Zone 3, where the indoor average radon level is less than 2 pCi/L. These results are below the USEPA Action Level of 4.0 pCi/L; therefore, STV concludes that it is unlikely that elevated levels of radon gas are present at the Site.

4.0 ADJOINING AND SURROUNDING PROPERTIES

The area surrounding the Site is primarily characterized low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR. The following table summarizes the adjoining site uses:

Direction	Facility Name/Description	Street Address/Location	Current Use
North	Commercial Office, Parking, Industrial/ Manufacturing	105-14 Merrick Blvd. 105-12 Merrick Blvd 105-02 Merrick Blvd. 104-32 Merrick Blvd. 104-28 Merrick Blvd. 104-22 Merrick Blvd. 104-12 Merrick Blvd. 104-10 Merrick Blvd. 104-02 Merrick Blvd.	Parking Lot Parking Lot Domino's Pizza/Appliance Repair Parking Lot RVM Wheels Vacant Manufacturing Facility Vacant Manufacturing Facility Vacant Manufacturing Facility Vacant Manufacturing Facility
East	Merrick Blvd. followed by Transportation/Utility and Parking and Retail Gasoline Sales	Merrick Blvd. 104-15 Merrick Blvd. 104-19 Merrick Blvd. 105-09 Merrick Blvd. 105-15 Merrick Blvd.	Public Street Sports Line Auto Repairs Auto repair facility (parking) Inter City Tire (truck tire center) BP Gas Station
South	Transportation /Utility followed by 107th Avenue	106-04 Merrick Blvd. 107th Avenue	First World Auto/Calvin Auto Body Public Street
West	Transportation/Utility	165-18 South Road	Jamaica Bus Depot

Based on our inspection of the adjacent and surrounding properties, the following off-site RECs/VECs were identified:

- Several auto repair facilities are located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- One (1) active gasoline filling station is located in the area surrounding the Site. This property is considered a REC/VEC based on its proximity to the Site.

5.0 HISTORICAL USE RESEARCH

5.1 Land Title Records and Tax Records

STV researched prior ownership information for the Site at the New York City Department of Finance (DOF) website. In addition, prior ownership information was researched through EDR's Environmental Lien Search and the New York City Department of Buildings (NYCDOB) Automated City Register Information System (ACRIS) on-line website. The subject property is currently owned by "Elna L Lewis". Based on the research, this entity has owned the Site since at least 2003. No environmental liens were identified for the Site. All prior ownership information reviewed is presented in *Appendix J*.

5.2 Historical USGS Topographic Quadrangles

STV reviewed available historical USGS Topographic Quadrangles for information regarding past uses of the Site and surrounding area. Topographic maps for the Brooklyn quadrangle were obtained for the following years: 1900 and 1924. Topographic maps for the Jamaica quadrangle were obtained for the following years: 1947, 1957, 1966, 1979, and 1994. The following table presents descriptions and interpretations from historical USGS topographic map review.

Year (Scale and Quadrangle)	Comments
1900 (1:62,500) Brooklyn	**Site:** The Site appears to be located amongst developed streets. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** Surrounding properties appear to be located amongst developed streets. The Long Island Railroad (LIRR) tracks are depicted to the north of the Site. A pond is depicted west-southwest of the Site on the south side of the LIRR tracks. The area a few blocks south of the Site appears as undeveloped land with only a few roadways present, rail lines, and a pond and wetlands area. Due to scale of the map, no further information can be obtained.
1924 (1:62,500) Brooklyn	**Site:** No significant changes are apparent to the Site property from the 1900 topographic map. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** No significant changes are apparent to the Site property from the 1900 topographic map. Due to scale of the map, no further information can be obtained.
1947 (1:25,000) Jamaica	**Site:** The Site is shown with one structure fronting Merrick Boulevard. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** The areas north, east, south, and west of the Site have been significantly developed with streets and structures. A long building is depicted northwest of the Site on the same block. Prospect Cemetery is identified west of the Site on the south side of the LIRR tracks where a pond was previously depicted. The Jamaica Station is located west-northwest of the Site. Water Supply Company Tank No. 2 is located east of the Site. Baisleys Pond is depicted several blocks south of the Site. The Contagious Disease Hospital and Queens General Hospital are located northwest of the Site on the south side of Union Turnpike.
1957 (1:24,000) Jamaica	**Site:** Elevation contour lines are depicted on the map and show the Site is approximately 30 feet amsl. No structure is depicted on the Site. No other significant changes are apparent to the Site property from the 1947 topographic map. **Surrounding Properties:** An Armory is identified several blocks north of the Site on the north side of the LIRR tracks. Water pumping stations are located east and south of the Site. A water tower is depicted west of Site in the immediate vicinity of Prospect Cemetery. The LIRR Hillside Support Facility is depicted to the east of the Site. St. Albans Naval Hospital is located southeast of the Site. No other significant changes are apparent to the surrounding properties from the 1947 topographic map.

Year (Scale and Quadrangle)	Comments
1966 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1957 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1957 topographic map.
1979 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1966 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1966 topographic map except the water tower that was west of Site near Prospect Cemetery is no longer depicted.
1994 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1979 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1979 topographic map.

Based on STV's review of historical topographic maps, the Site appears to be amongst developed streets as early as 1900. No evidence of filling was noted on the Site property. The Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site. The review of historical USGS Topographic Quadrangles did not indicate RECs, CRECs, HRECs, or VECs at the surrounding areas. Copies of historical USGS Topographic Maps are included in *Appendix F*.

5.3 Historical Aerial Photographs

STV reviewed historical aerial photographs of the Site and surrounding areas provided by EDR in order to identify historical land use that may have involved hazardous substances and petroleum products. Aerial photographs were obtained for the following years: 1924, 1951, 1954, 1961, 1966, 1975, 1984, 1994, 2006, 2009, and 2011. The following table summarizes descriptions and interpretations from the historical aerial photograph reviews:

Year	Comments
1924 1" – 500'	**Site:** The Site appears to be developed with a structure. Due to the scale of the photograph, no further details can be discerned. **Surrounding Properties:** The areas adjacent to the Site to the east and south appear to be developed with multiple structures. The area north of the Site appears to be developed with a structure. A long building is visible northwest of the Site on the same block. Railroad tracks are depicted to the north. Due to scale of the photograph, no further details can be discerned.
1951 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1924 aerial photograph. **Surrounding Properties:** The areas adjacent to the Site to the east and south appear to be developed with multiple structures. The area north of the Site appears to be developed with a structure. A long building is visible directly northwest of the Site on the same block. Railroad tracks are depicted to the north. A large water tank is located south of the Site. Due to scale of the photograph, no further details can be discerned. No other significant changes are discernible to the adjacent and surrounding properties from the 1924 aerial photograph.
1954 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1951 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1951 aerial photograph.

Year	Comments
1961 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1954 aerial photograph. **Surrounding Properties:** A vacant lot and/or parking lot north of the Site appears to be developed with a structure. Some of the structures south of the Site on the same block are gone and the area appears to be used as storage for truck trailers or cargo containers. Two water tanks are located south of the Site. No other significant changes are discernible to the adjacent and surrounding properties from the 1954 aerial photograph.
1966 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1961 aerial photograph. **Surrounding Properties:** More the structures south of the Site on the same block are gone and the area appears to be used as storage for truck trailers or cargo containers. No other significant changes are discernible to the adjacent and surrounding properties from the 1961 aerial photograph.
1975 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1966 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1966 aerial photograph.
1984 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1975 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1975 aerial photograph.
1994 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1975 aerial photograph. The image is of poor quality. **Surrounding Properties:** The structures on the block south of the Site's block are gone and the area appears to be vacant. No other significant changes are discernible to the adjacent and surrounding properties from the 1975 aerial photograph. The image is of poor quality.
2006 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1994 aerial photograph. **Surrounding Properties:** A large building complex has been constructed on the block south of the Site's block. No other significant changes are discernible to the adjacent and surrounding properties from the 1994 aerial photograph.
2009 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2006 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2006 aerial photograph.
2011 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2009 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2009 aerial photograph.

The review of historical aerial photographs did not indicate RECs, CRECs, HRECs, or VECs at the Site or surrounding areas. Copies of reproducible historical aerial photographs are included in *Appendix G*.

5.4 Historical Fire Insurance Maps (Sanborn® Maps)

A search for historical fire insurance maps for the Site and adjoining properties was conducted by EDR. These maps were obtained for the following years: 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006. The following table presents descriptions and interpretations from historical fire insurance map review.

Year	Comments
1901	**Site:** The Site is depicted as vacant land. **Surrounding Properties:** Surrounding properties include residential dwellings, sheds, a hotel, a polling place, a **blacksmith,** and a **sign painting shop**. A large tract of vacant land is located immediately west of the Site.

Year	Comments
1912	**Site:** The Site is depicted with a commercial structure. No other significant changes have occurred to the Site from the 1901 map. **Surrounding Properties:** Several more residential dwellings have been developed in the areas north, east, south, and west of the Site. The **sign painting shop** is no longer depicted to the north-northeast of the Site across Merrick Blvd. No other significant changes have occurred to the adjacent and surrounding properties from the 1901 map.
1926	**Site:** No significant changes have occurred to the Site from the 1912 map. **Surrounding Properties:** Several residential dwellings have been developed on the blocks northeast and west of the Site. An **auto painting facility** is located to the north-northeast of the Site across Merrick Blvd. and a **sign painting shop** is located to the north of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1912 map.
1951	**Site:** The commercial structure is labeled '**upholstery**'. No other significant changes have occurred to the Site from the 1926 map. **Surrounding Properties:** Two **iron works**, two **auto repair facilities**, a **lacquer paint shop**, and two **gasoline filling stations** are located to the north of the Site on the same block. An **auto body repair shop** and a **gasoline filling station** are located to the east of the Site across Merrick Blvd. A **gasoline filling station**, **carpet cleaner**, and **auto repair and paint shop** are located to the south of the Site. The New York City Transit System Service Station and Garage is located to the west of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1926 map.
1981	**Site:** No significant changes have occurred to the Site from the 1951 map. **Surrounding Properties:** A structure northwest of the Site is now labeled '**auto parts mfg**'. A building labeled '**salvage depot**' is located to the northwest of the Site. A **print shop** and two **auto repair facilities** are located east of the Site. A **truck repair sh**op is located to the east of the Site. The two **gasoline filling stations** to the north of the Site and the **gasoline filling station** south of the Site are no longer depicted. Several residential dwellings and other structures located toward the southern end of the Site block are gone and the area is labeled 'bus parking'. No other significant changes have occurred to the adjacent and surrounding properties from the 1951 map.
1982	**Site:** No significant changes have occurred to the Site from the 1981 map. **Surrounding Properties:** The **carpet cleaner** located to the south of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1981 map.
1986	**Site:** No significant changes have occurred to the Site from the 1982 map. **Surrounding Properties**: A **junk yard** is depicted to the east of the Site along 106th Avenue. No other significant changes have occurred to the adjacent and surrounding properties from the 1982 map.
1988-1993	**Site:** The commercial structure is no longer labeled '**upholstery**' beginning in 1992. No other significant changes have occurred to the Site from the 1986 map. **Surrounding Properties**: The **junk yard** is no longer depicted beginning in 1991. An **auto repair facility** is depicted at the southeast corner of Merrick Blvd. and 104th Avenue beginning in 1993. No other significant changes have occurred to the adjacent and surrounding properties from the 1986 map.
1995	**Site:** No significant changes have occurred to the Site from the 1993 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1993 map.
1996	**Site:** No significant changes have occurred to the Site from the 1995 map. **Surrounding Properties:** An **auto repair and wash facility** is depicted to the north of the Site on the same block. No significant changes have occurred to the adjacent and surrounding properties from the 1995 map.
1999	**Site:** No significant changes have occurred to the Site from the 1996 map. **Surrounding Properties:** The **gasoline filling station** located to the east of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1996 map.

Year	Comments
2001-2006	**Site:** No significant changes have occurred to the Site from the 1999 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1999 map.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the Site:

- The historic use of the Site as an upholstery shop is considered a REC/VEC.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the surrounding areas:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Several current auto repair facilities and one retail gasoline filling station were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

Copies of the historical fire insurance maps are provided in *Appendix H*.

5.5 City Directories

A review of historical city directories for the Site and surrounding areas was conducted by EDR. The following table presents descriptions and interpretations from the historical city directory reviews.

Year	Comments
1922	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1934	**Site:** The Site address was listed for residential listings. **Surrounding Properties:** Surrounding properties included residential listings and a bakery.
1939	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a **junk yard**, **auto repairs**, an **auto painting shop**, a **gasoline filling station,** and the Dry Steam Appliance Co.
1945	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, an auto parts store, a **home heating oil service**, and a **gasoline filling station**.
1950	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, offices, liquor store, a garage, a grocery, a tavern, a tool and die company, a **printing company**, an **iron works**, a **home heating oil service**, a **gasoline filling station**, and a nursing home.
1962	**Site:** The Site address was listed for residential listings and an art shop. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and an electronics corporation.
1967	**Site:** The Site address was listed for residential listings and an art shop. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and a **gasoline filling station**.
1970	**Site:** The Site address was listed for residential listings. **Surrounding Properties:** Surrounding properties included residential listings and **auto body**

Year	Comments
	shops.
1976	**Site:** The Site address was listed for residential listings. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1983	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1991	**Site:** The Site address was listed for residential listings. **Surrounding Properties:** Surrounding properties included residential listings**, auto body shops,** and Rocket Sewer Service.
1996	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
2000	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a **printing company**, **auto body shops**, and a daycare facility.
2005	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a **printing company**, **auto body shops**, an auto wrecking facility, a furniture store.
2008	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and a storage facility.
2013	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, the **Hadco Metal Trading Co**., **auto body shops**, a medical office, a **printing company**, restaurants, and Caribbean Heating Corp.

The review of the historical city directories did not revealed the presence of RECs/VECs at the Site.

The review of historical city directories revealed the presence of the following RECs and VECs at the surrounding areas:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

Copies of the historical city directories are provided in *Appendix J.*

5.6 Prior Reports

STV reviewed a *Phase I ESA for Eight Properties Near Jamaica Bus Depot*, dated February 17, 2012. The report was prepared by STV on behalf of MTA NYCT. The properties are located in the Borough of Queens, New York, including Lots 41, 53, 60, 61, 63, 66, 68, and 72 within Block 10164. The Phase I ESA identified RECs in connection with the properties addressed as 103-16 Merrick Boulevard and 103-30 Merrick Boulevard. These properties historically including an auto repair shop and filling stations with gasoline storage tanks. Additionally, an existing product plume at the Site and adjacent properties is considered a REC. Finally, based on open spills, undocumented tightness testing and known subsurface contamination, the Jamaica Bus Depot and BP Service Station #11009 represent RECs. The Phase I ESA revealed environmental concerns associated with the Site including suspect ACM, LBP on interior and exterior painted surfaces, suspect PCBs, and water staining and mold growth.

The report concluded that NYCT has performed extensive soil and groundwater investigations, including post-remediation sampling, at the Jamaica Bus Depot from approximately 2002 to the present. Based on the ongoing environmental monitoring being administered under NYSDEC Global Consent Order, active pump and treat remediation system, and numerous sub-surface environmental investigations that have been performed at the Jamaica Bus Depot, a Phase II Environmental Site Investigation (ESI) was not required. Based on the review of this existing information, recommendations were provided for engineering controls to be implemented during future site development. At a minimum, the following remedial actions and/or engineering controls are required to render the Site suitable for use:

1. Prior to any site redevelopment, a geophysical survey should be performed to determine if any underground storage tanks (USTs) are present at 103-16 Merrick Boulevard, 103-30 Merrick Boulevard and any other potential excavation locations. Additionally, in the event that a UST is discovered, an evaluation should be made at that time of the need for any additional investigation to determine whether soil and/or groundwater has been adversely impacted more than is currently documented.
2. As a safeguard to prevent potential volatile organic compounds in soil vapor from entering the new building in the future, a soil vapor barrier should be integrated into the new building design.
3. All material excavated during construction activities should be properly characterized and disposed, including collection and analysis of additional samples if required by the contractor-selected disposal facilities.
4. After the proposed new building and grounds are constructed, any exposed soil (landscaped areas) must be covered with at least two feet of environmentally clean fill.
5. Suspect ACM, LBP, PCB-containing materials and/or mold encountered during construction or excavation should be properly identified and managed.

5.7 Other Historical Sources

In 2012, STV was provided with several previous environmental reports pertaining to the area adjacent to the Site - the NYCT Jamaica Depot located at 165-18 South Road, Jamaica, Queens, NY. URS Corporation (URS) is currently providing environmental engineering services for the Jamaica Bus Depot in conjunction with NYCT's UST program. The work is being administered under NYSDEC Global Consent Order CO2-20000101-3341 dated May 2001. NYCT has been operating a pump and treat remediation system to recover a combined heating oil and diesel fuel release since 1995 at the Jamaica Bus Depot. NYSDEC spill #9010039 was initially reported on December 14, 1990 and continues to be an open case, along with several other spills that occurred consequently. Numerous investigations have been performed at the Jamaica Bus Depot by URS to evaluate the extent of product in the sub-surface and all possible in-situ remedial measures to address petroleum-impacted soil and groundwater. These are as follows:

- Soil Investigation Report, October 2002. This investigation consisted of the advancement of five soil borings within the plume and collecting soil samples to determine the presence and vertical extent of petroleum-impacted soil beneath the water table. This study was prompted by NYCDEP's intention to re-activate the Jamaica Water Supply wells for regional dewatering in 2007 which could lower the water table by as much as 16 feet. The study concluded that product releases likely occurred when the water table was depressed during the previous operation of the Jamaica water supply system (pre-1996). However, soil impacts when compared with cleanup objectives were insignificant.
- Site-Specific Investigation Work Plan (SSIWP), May 2004. A soil and groundwater investigation was conducted in 2003 to determine the levels to which product had impacted soils relative to

NYSDEC TAGM soil cleanup objectives, the results of which were reported in this SSIWP. Six borings were advanced with soil samples and groundwater samples were collected from nearby wells. The results imply that free product and the associated petroleum contaminants detected in soils were not significantly impacting dissolved-phase groundwater quality. The SSWIP also discussed the feasibility of bioremediation at the Jamaica Depot.

- Feasibility of Enhanced Product Recovery through Site-Wide Groundwater Depression, May 2004. This feasibility study (FS) was prompted by NYSDEC correspondence to URS dated April 29, 2004 that suggested that the product recovery system be enhanced or redesigned to increase product recovery through a significant increase in the pumping rate to overcome the rise in groundwater levels. The FS consists of dewatering calculations to determine the capacity of a remediation system capable of lowering the water table in the depot area by five feet. The pumping rate was estimated on the higher end of the range from 400 to 4,000 gpm, based on operating data from the existing system. The FS also stated that the product plume was currently trapped beneath the water table but was stable and not migrating.
- Site-Specific Remedial Plan (SSRP) for In-Situ Bioremediation Investigation, October 2004. In-situ enhanced bioremediation was recommended as the only feasible technology for soil remediation, considering the site constraints. Implementation would be done through the injection of a slurry of oxygen-releasing material in the subsurface. An investigation was performed in June 2004 to support this recommendation and thus acquire site-specific information pertaining to existing microbiologic conditions within and outside of the historic limits of the free product plume. Two borings were advanced (GP-7 and GP-8) near existing monitoring wells (W-10 and W-25) and samples were collected for both, respectively.
- Site-Specific Remedial Plan and Remedial Design (SSRP/RD) for Enhancing Product Recovery, March 2005. The SSRP/RD was designed to address the fact that effective in-situ technologies to treat trapped product are limited. At a meeting with NYSDEC and NYCT on February 25, 2005, one potential approach was identified utilizing the full capacity of a single extraction well for recovery in of product in that area. The SSRP/RD was approved in a letter dated May 5, 2005 by the NYSDEC for the use of one well (PW-4) to pump 170 gallons per minute (gpm) in order to lower the water table by four feet in an area extending 20-25 feet from the extraction point. If the design is successful, it will be utilized at a later date to address the rest of the plume.
- Remediation Analytical Data, 2008-2011. Groundwater quality is being monitored during remediation at the Jamaica Depot, as well as groundwater and product levels.

5.8 Historical Use Interviews

No other historical sources were available for interview.

6.0 REGULATORY AGENCY RECORD REVIEWS

The databases discussed in this section, provided by EDR, were reviewed for information regarding documented and/or suspected releases of regulated hazardous substances and/or petroleum products on or near the Site (*Appendix I*). STV also reviewed the "unmappable" (also referred to as "orphan") listings within the database report, cross-referencing available address information and facility names. Unmappable sites are listings that cannot be plotted with confidence, but are identified as being located within the general area of the Site based on the partial street address, city name, or zip code. In general, a listing cannot be mapped due to inaccurate or incomplete address information in the database that was supplied by the corresponding regulatory agency. Any listings from the unmappable summary which were identified by STV as a result of the area reconnaissance and/or cross-referencing to mapped listings are included in the corresponding database discussion within this section.

6.1 Federal and State Regulatory Agency Database Reviews

A review of federal and state records for the Site was accomplished by contacting offices of Federal and State regulatory agencies and review of the regulatory listings compiled in the regulatory agency database report (*Appendix I*). The results of the review of the Federal and State records are presented below. Copies of the correspondences are included in *Appendix K*.

United States Environmental Protection Agency (USEPA)
The USEPA is responsible for protecting human health and the environment. To that end, the USEPA develops and enforces regulations that implement environmental laws enacted by Congress. A Freedom of Information Law (FOIL) request dated October 1, 2015 was filed with the USEPA to determine if the agency holds additional records pertaining to the Site property. USEPA acknowledged the request on October 1, 2015. At the time this report was issued, STV had not yet received any further responses from USEPA. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

The status of the Site was also checked on USEPA's MyPropertyInfo website on September 30, 2015. A search of the databases did not locate any environmental records. A copy of the MyPropertyInfo result is included in *Appendix K*.

New York State Department of Environmental Conservation (NYSDEC)
The NYSDEC maintains files of incidents involving environmentally regulated materials, spill incidents, and state regulated cleanups. The records maintained by NYSDEC include reports of spills of hazardous chemicals and petroleum, petroleum bulk storage information, and site-specific environmental data. NYSDEC information concerning the Site property was requested in a FOIL records access application dated October 1, 2015. NYSDEC acknowledged the request on October 2, 2015. NYSDEC sent a response email dated October 13, 2015, indicating that no records have been located for the Site.

New York State Department of Health (NYSDOH)
The NYSDOH Records Access Office maintains files of health-related environmental incidents in the State of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYSDOH information concerning the Site property was requested in a formal letter dated September 30, 2015. NYSDOH acknowledged the request on September 30, 2015. NYSDOH sent a response letter dated October 23, 2015, indicating that no records have been located for the Site.

A summary of sites identified through the Federal and State regulatory agency database review is provided in the following table:

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
National Priorities List for Federal Superfund Cleanup (NPL)	03/26/2015	1 mile	0	No	No
Delisted NPL Site List	03/26/2015	1 mile	0	No	No
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), including CERCLIS NFRAP Sites	10/25/2013	½ mile	0/0	No	No
Resource Conservation and Recovery Information System – Corrective Action Activity (RCRIS CORRACTS) and Non-CORRACTS Treatment, Storage, or Disposal Facilities (RCRIS-TSD)	06/09/2015	1 mile / ½ mile	0/0	No	No
Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)	06/09/2015	¼ mile	2/1/2	No	**Yes**
RCRA Non-Generator	06/09/2015	¼ mile	10	No	**Yes**
Federal Institutional Control/Engineering Control Registries	06/09/2015	½ mile	0/0	No	No
Emergency Response Notification System (ERNS)	06/22/2015	Site	NA[1]	No	No
State Toxic Release Inventory System (TRIS)	12/31/2013	¼ mile	0	No	No
Hazardous Substance Waste Disposal Site Inventory (HSWDS)	01/01/2003	½ mile	0	No	No
New York State Inactive Hazardous Waste Disposal Sites (SHWS)	08/17/2015	1 mile	3	No	No
Solid Waste Management Facilities Sites (SWF/LF)	06/24/2015	½ mile	12	No	**Yes**
Vapor Reopened	11/01/2014	1 mile	1	No	No
New York State Spills Information (NY Spills)/Leaking Underground Storage Tanks (LTANKS)	08/17/2015	½ mile 1/8 mile	14/31	No	**Yes**
Petroleum Bulk Storage Tanks (USTs/ASTs)	07/29/2015	¼ mile	5/11	No	**Yes**
NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)	01/01/2002	¼ mile	0/1	No	**Yes**
NY Chemical Bulk Storage Tanks (NY CBS)	07/29/2015	¼ mile	2	No	**Yes**
Historic Bulk Storage Tanks (USTs/ASTs)	01/01/2002	¼ mile / Site	1/0	No	**Yes**
New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)	08/17/2015	1 mile	0/0	No	No
E-Designation Site (E)	05/27/2015	1/8 mile	38	**Yes**	**Yes**

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
Registered Dry Cleaners	07/02/2015	½ mile	0	No	No
EDR US Hist Auto Stat	NA	¼ mile	37	No	**Yes**
EDR US Hist Cleaners	NA	½ mile	1	No	**Yes**
NY Manifest	08/01/2015	¼ mile	17	No	**Yes**
NJ Manifest	12/31/2013	¼ mile	3	No	**Yes**
RI Manifest	12/31/2013	¼ mile	1	No	**Yes**
Manufactured Gas Plant Sites (Coal Gas)	NA[2]	1 mile	1	No	No

* The surrounding area search radius indicates the radial area (measured from the perimeter of the Site) for which the database review was performed.
[1]NA – Not Applicable
[2] This database consists of a compilation of historic resources (as early as the late 1800s) prepared by EDR that does not require updates. The last MGP in New York State ceased operations in 1972.

The Site is listed in the E-Designation database. The following subsections provide a discussion of the listings that have been identified within the search radii and are in the table above:

National Priorities List of Federal Superfund Cleanup (NPL)
The NPL is a subset of the CERCLIS, and lists properties that are ranked as high priority for cleanup under the federal Superfund program. Neither the Site nor any other facility within one mile of the Site is listed in the NPL Site List.

Delisted NPL Site List
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the USEPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425 (e), sites where no further response is appropriate may be deleted from the NPL. Neither the Site nor any other facility within one mile of the Site is listed in the Delisted NPL Site List.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
The CERCLIS list is a compilation of known and suspected uncontrolled or abandoned hazardous waste sites which are, or were, under investigation by USEPA but have not been elevated to the status of a Superfund (NPL) site. Former CERCLIS sites that have been granted the status of No Further Remedial Action Planned (NFRAP) are also included in the database. Neither the Site nor any other facility within one-half mile of the Site is listed in the CERCLIS or CERCLIs NFRAP databases.

Resource Conservation and Recovery Information System (RCRIS) – Treatment, Storage, or Disposal Facilities (TSD) and RCRIS Corrective Action Activity (CORRACTS)
The RCRA program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRIS database tracks facilities that treat, store, and/or dispose of hazardous waste as defined by RCRA (referred to as TSD facilities). The RCRIS CORRACTS database identifies TSD facilities that have conducted, or are currently conducting, corrective action(s) as regulated under RCRA.

Neither the Site nor any other facility within one mile of the Site is listed in the RCRIS CORRACTS database and neither the Site nor any other facility within one-half mile of the Site is listed in the RCRIS-TSD database.

Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)
This list includes operations that generate or transport hazardous waste for which a hazardous waste generator identification number or transporter permit is required. The RCRIS Gen/Trans listing is merely a listing of all facilities that, due to the amount of hazardous waste generated, are required to register with the USEPA for tracking purposes, but are not necessarily those with reported contamination incidents. The Site was not listed in the RCRIS Gen/Trans database.

Two (2) RCRA Large Quantity Generators (RCRA-LQG) were listed within a one-quarter mile radius of the Site. Based on their distance from the Site and lack of reported violations, these RCRA-LQG listings are not anticipated to have affected the environmental integrity of the Site.

One (1) RCRA Small Quantity Generator (RCRA-SQG) was listed within a one-quarter mile radius of the Site. The following RCRA-SQG facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
R&S Parts & Service Inc. dba Strauss Auto 168-08 Liberty Avenue Jamaica, NY 11433	952-ft/North-northwest	Up-gradient	L101	EPA ID: NYD980758080. The Site is also listed on the NY Manifest database. Facility generates spent halogenated solvents.

Two (2) RCRA Conditionally Exempt Small Quantity Generators (RCRA-CESQG) were listed within a one-quarter mile radius of the Site. The following RCRA-CESQG facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCTA 165-18 South Road Jamaica, NY 11433	840-ft/Northwest	Cross-gradient	J92	EPA ID: NYD980642268. The Site is also listed on the US AIRS, NJ Manifest, and RI Manifest databases. Facility generates cadmium, lead, and waste oils and has listed violations associated with its operations.

Based on its distance from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow direction, the other RCRA-CESQG listing is not anticipated to have affected the environmental integrity of the Site.

Resource Conservation and Recovery Information System Non-Generators / No Longer Reporting (RCRA NonGen / NLR)
RCRAInfo is USEPA's comprehensive information system, providing access to data supporting the RCRA of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the RCRA. Non-Generators do not presently generate hazardous waste. The Site is not listed in the RCRA NonGen / NLR database.

Ten (10) RCRA NonGen / NLR facilities were identified within a one-quarter mile radius of the Site. The following RCRA NonGen / NLR facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	13-ft/East-northeast	Cross-gradient	A2	EPA ID: NYD981874407. The Site is also listed on the NY Manifest database.
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	155-ft/East-southeast	Cross-gradient	A8	EPA ID: NYD987030012. The Site is also listed on the NY Manifest database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	1,004-ft/Northwest	Up-gradient	M106	EPA ID: NYD986903763. The Site is also listed on the NY Manifest database. The facility is a retail gasoline filling station.

None of the other RCRA Non/Gen /NLR listings are anticipated to have affected the environmental integrity of the Site, based on their distances from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow directions.

Federal Institutional Control/Engineering Control Registries

The Federal Institutional Control/Engineering Control Registries are listings of sites with engineering controls and/or institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining at a site. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or affect human health. Neither the Site nor any other facility within one-half mile of the Site is listed in the Federal Institutional Control/Engineering Control Registries.

Emergency Response Notification System (ERNS)

The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances. The Site is not listed in the ERNS database.

New York State Toxic Release Inventory System (TRIS)

The Toxic Release Inventory System (TRIS) is a database used to collect information and report releases of toxic chemicals to the air, water, and land in reportable quantities. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the TRIS database.

Hazardous Substance Waste Disposal Site Inventory (HSWDS)

The list includes any known or suspected hazardous substance waste disposal sites. Also included are sites delisted from the Registry of Inactive Hazardous Waste Disposal Sites and non-Registry sites that

USEPA Preliminary Assessment (PA) reports or Site Investigation (SI) reports were prepared. Hazardous Substance Waste Disposal Sites are eligible to be Superfund sites. The sites on the list will not automatically be made Superfund sites; rather each site will be further evaluated for listing on the Registry. Neither the Site nor any other facility within one-half mile of the Site is listed in the HSWDS database.

New York State Inactive Hazardous Waste Disposal Sites (SHWS)
The New York State Inactive Hazardous Waste Disposal Sites database, compiled by the NYSDEC, maintains information regarding the investigation and cleanup of suspected hazardous waste sites. The Site is not listed in the SHWS database.

Three (3) SHWS facilities were listed within a one-mile radius of the Site. Based on their distances from the Site (greater than one-half mile) and/or inferred down-gradient groundwater flow direction, these SHWS facilities are not anticipated to have affected the environmental integrity of the Site.

Solid Waste Management Facilities Sites (SWF/LF)
The SWF/LF database is a comprehensive listing of State permitted/recorded solid waste management facilities. The Site is not listed in the SWMF database.

Twelve (12) SWF/LF facilities were listed within a one-half mile radius of the Site. The following SWF/LF facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Taylor Auto Collision 104-21 Merrick Blvd. Jamaica, NY 11433	500-ft/North-northwest	Up-gradient	E54	The Site was engaged in vehicle dismantling. The Site is inactive.
Junk Yard International 169-09 Liberty Avenue Jamaica, NY 11433	1,081-ft/North	Up-gradient	N115	The Site was engaged in vehicle dismantling. The Site is inactive.
S&S Super Sports Auto Care Inc. 94-40 Merrick Blvd. Jamaica, NY 11433	1,272-ft/Northwest	Up-gradient	Q133	The Site was engaged in vehicle dismantling. The Site is inactive.

Based on their distances from the Site and/or inferred down-gradient groundwater flow direction, the other SWF/LF facilities are not anticipated to have affected the environmental integrity of the Site.

Vapor Reopened
New York is currently re-evaluating previous assumptions and decisions regarding the potential for soil vapor intrusion exposures at sites. As a result, all past, current, and future contaminated sites will be evaluated to determine whether these sites have the potential for exposures related to soil vapor intrusion. The Site is not listed in the Vapor Reopened database.

One Vapor Reopened facility was listed within a one-mile radius of the Site. The facility is identified as West Side Corp., and is located 3,306-ft east-northeast of the Site at 107-10 180th Street. This facility is also listed in the NY UST and Historical UST databases. The site contains soil vapor and contaminated groundwater above guidance values. Based on its distance from the Site and/or inferred down-gradient

groundwater flow direction, this Vapor Reopened listing is not anticipated to have affected the environmental integrity of the Site.

New York State Spills Information Database (NY Spills)/Leaking Underground Storage Tanks (LTANKS)
The NY Spills database, including LTANKS sites, was researched to identify listings within one-half mile of the Site. The database search identified 14 reported NY Spills and 31 LTANKS incidents within one-half mile of the Site. The Site is not listed in the NY Spills/LTANKs databases.

The following NY Spills / LTANKS facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	840-ft/Northwest	Cross-gradient	J94	Spill No. 9010039 was reported on 12/14/90. The spill was the result of a tank test failure. The spill is not closed. There are known petroleum-impacted soils and groundwater. NYCT has been operating a pump and treat system since 1995.

Based on distance from the Site combined with the assumed hydraulic relationship and/or the nature of the incident/regulatory status, none of the other facilities located within one-half mile of the Site identified in the NY Spills/LTANKS databases are expected to impact the environmental integrity of the Site.

Petroleum Bulk Storage Tanks (USTs/ASTs)
The NYSDEC PBS tank database was researched to identify listings for the Site and adjacent properties. The PBS Tank database is a listing of all facilities that are required to register their storage tanks for tracking purposes and not necessarily those with reported contamination incidents. The Site is not listed in the PBS tank database.

A total of 16 facilities (5 UST sites and 11 AST sites) were identified within one-quarter mile from the Site. The following UST facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BHELA 105-15 Merrick Blvd. Jamaica, NY 11433	184-ft/North	Up-gradient	A9	PBS No. 2-601509. The Site is an active retail gasoline filling station. The site has three (3) 4,000-gallon gasoline USTs and one (1) 4,000-gallon diesel UST. The Site is also listed on the NY AST database.
Jamaica Bus Depot - NYCT 165-18 South Road	840-ft/Northwest	Cross-gradient	J95	PBS No. 2-190225. The site has five (5) 4,000-

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica, NY 11433				gallon diesel USTs and five (5) 4,000-gallon biodiesel UST. There are two (2) 15,000-gallon #6 fuel oil USTs and twelve (12) 2,000-gallon diesel USTs that are closed-in-place. There are two (2) 15,000-gallon #2 fuel oil USTs that are temporarily out-of-service. The site has a history of spills with one open spill case.
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	1,004-ft/Northwest	Up-gradient	M107	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-gallon #2 fuel oil UST that are all closed-in-place.

Based on distance from the Site, assumed hydraulic relationship, the lack of known releases with the potential to affect the Site, and/or current regulatory status, none of the other facilities identified within one-quarter mile of the Site in the PBS database are expected to impact the environmental integrity of the Site.

NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)

The NYSDEC chemical bulk storage (NY CBS UST/AST) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS UST/AST database lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons and/or in underground tanks of any size. The Site was not identified on the NY CBS UST/AST database.

One facility was listed within one-quarter mile of the Site. This NY CBS UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	840-ft/Northwest	Cross-gradient	J93	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS, and NY Spills databases.

NY Chemical Bulk Storage (NY CBS)

The NYSDEC chemical bulk storage (NY CBS) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons. The Site was not identified on the NY CBS database.

Two (2) facilities were listed within one-quarter mile of the Site. The following facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	840- ft/Northwest	Cross-gradient	J93	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Based on its distance from the Site, the other NY CBS listing is not anticipated to have affected the environmental integrity of the Site.

Historical Bulk Storage Tanks (USTs/ASTs)

These facilities have petroleum bulk storage capabilities in excess of 1,100 gallons and less than 400,000 gallons. This database contains detailed information per site. This database is no longer updated. More current data is presented in the PBS UST/AST databases. The Site is not listed in the HIST UST/AST databases.

The database identified the presence of one (1) historic UST facility located within one-quarter mile of the Site. This HIST UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	1,004- ft/Northwest	Up-gradient	M107	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-gallon #2 fuel oil UST that are all closed-in-place.

New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)

The Voluntary and Brownfield remedial programs involve mostly private entities and private funds to remediate contaminated sites and return the properties to productive use. The NYSDEC VCP/BCP database was researched to identify listings for the Site and within a one-mile radius of the Site. Neither the Site nor any other facility within one mile of the Site is listed in the VCP/BCP databases.

E-Designation Site Listing (E-Designation)

The E (Environmental) Designation would ensure that sampling and remediation take place on the subject properties, and would avoid any significant impacts related to hazardous materials at these locations. The E-designations require that the owner of the sites conduct testing and sampling following set protocols, to the satisfaction of city agencies. In addition, the owner must remediate when appropriate. The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing for the Site for hazardous materials is considered to be a REC/VEC.

The database identified thirty-eight (38) E-Designation listings within a one-eighth-mile radius of the Site. The listings are associated with E-designation reference No. E-39 (Underground Gasoline Storage Tanks Testing Protocol) and E-175 (Underground Gasoline Storage Tanks Testing Protocol). The listed sites are all considered as RECs/VECs with respect to the Site.

Registered Dry Cleaners

The NYSDEC registered dry cleaners database was researched to identify listings within one-quarter mile of the Site. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the dry cleaners database.

EDR Exclusive Historic Auto Stations (EDR US Hist Auto Stat)

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is not listed in the EDR US Hist Auto Stat database.

The database search identified 37 listings within one-quarter mile of the Site. The EDR Hist Auto Stat facilities that are considered RECs/VECs with respect to the Site are as follows:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
106-04 Merrick Blvd. Jamaica, NY 11433	13 feet/ East-northeast	Down-gradient	A3	Identified as Birds Auto Repair. Listed for years 1999-2012.
106-03 Merrick Blvd. Jamaica, NY 11433	65 feet/ Northeast	Down-gradient	A5	Identified as Truck Repair Services. Listed for years 2011 and 2012.
105-17 Merrick Blvd. Jamaica, NY 11433	197 feet/ North-northwest	Cross-gradient	A12	Identified as Fred's Auto Repair. Listed for year 2002.
105-15 Merrick Blvd. Jamaica, NY 11433	202 feet/ North-northwest	Cross-gradient	A15	Identified as Citgo Gas Station and Henrys Repair Shop. Listed for years 1999-2001.
105-09 Merrick Blvd. Jamaica, NY 11433	215 feet/ North-northwest	Cross-gradient	A18	Identified as Inter City Tire Corp. Listed for year 2006.

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
105-02 Merrick Blvd. Jamaica, NY 11433	222 feet/ North-northwest	Cross-gradient	A20	Identified as Garvey's Auto Repair and Ralke Auto Repairs. Listed for years 1999, 2000, 2011, and 2012.
107-17 Merrick Blvd. Jamaica, NY 11433	326 feet/ Southeast	Down-gradient	D39	Identified as E&D Auto Seat Cover, Dave's Precision Auto Service Inc., Inspection City Auto Repair Inc., and Haldane Auto Service. Listed for years 1999-2008 and 2010-2012.
107-35 Merrick Blvd. Jamaica, NY 11433	445 feet/ Southeast	Down-gradient	D45	Identified as Mystique Auto Body Works Corp. Listed for years 1999-2002, 2004, 2005, and 2009.
104-28 Merrick Blvd. Jamaica, NY 11433	490 feet/ North-northwest	Cross-gradient	E50	Identified as AAA Transmissions & Engines. Listed for years 2004, 2005, and 2009.
104-21 Merrick Blvd. Jamaica, NY 11433	502 feet/ North-northwest	Up-gradient	E55	Identified as Taylor Auto Collision Inc. Listed for years 1999-2002, 2004-2009, and 2011.
104-19 Merrick Blvd. Jamaica, NY 11433	508 feet/ North-northwest	Up-gradient	E56	Identified as Full Line Auto Repairs. Listed for years 1999-2001, 2003-2007, and 2009-2012.
104-15 Merrick Blvd. Jamaica, NY 11433	522 feet/ North-northwest	Up-gradient	E60	Identified as Dynamic Autoworks Inc., Ace Auto Body & Truck Repair, Jimmy's Trans & Auto Repair, and Sports Line Auto Repair. Listed for years 1999-2005, 2008, 2010, and 2012.
104-13 Merrick Blvd. Jamaica, NY 11433	528 feet/ North-northwest	Up-gradient	E64	Identified as Full Line Auto Repairs. Listed for year 2002.
104-09 Merrick Blvd. Jamaica, NY 11433	541 feet/ North-northwest	Up-gradient	E66	Identified as Junior Auto Collision, RJS Car Care Center Inc., L&C Auto Collision, NASCAR Auto Body Inc., and Integrity Collision & Towing. Listed for years 2001-2012.
107-55 Merrick Blvd. Jamaica, NY 11433	577 feet/ Southeast	Down-gradient	D71	Identified as General Auto Body Works Listed for years 1999, 2000, 2002-2005, 2009-2012.
107-57 Merrick Blvd. Jamaica, NY 11433	591 feet/ Southeast	Down-gradient	H75	Identified as Birds Auto Repair Listed for years 2003 and 2005-2012.
107-61 Merrick Blvd. Jamaica, NY 11433	624 feet/ Southeast	Down-gradient	H83	Identified as D&G Foreign Auto Repair. Listed for years 2010-2012.
107-65 Merrick Blvd. Jamaica, NY 11433	643 feet/ Southeast	Down-gradient	H87	Identified as H&S Auto Trans & Repair, New Queens Village Auto Service, and Queens Village Auto Radiator. Listed for years 2001, 2005, and 2010-2012.

Due to their distances from the Site and/or the presumed groundwater flow direction none of the other EDR Hist Auto Stat facilities are considered RECs/VECs with respect to the Site.

EDR Exclusive Historic Dry Cleaners (EDR US Hist Cleaners)
EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is not listed in the EDR US Hist Cleaners database.

The database search identified one (1) listing within one-half mile of the Site. This facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
107-37 166th Street Jamaica, NY 11433	587 feet/ South	Down-gradient	F74	Identified as ABD Cleaners Corp. Listed for year 2009.

NY Manifest
The NY Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the NY Manifest database.

Seventeen (17) NY Manifest facilities were identified within one-quarter mile of the Site. The following NY Manifest facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	13-ft/East-northeast	Cross-gradient	A2	EPA ID: NYD981874407. The Site is also listed on the RCRA NonGen / NLR database.
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	155-ft/East-southeast	Cross-gradient	A8	EPA ID: NYD987030012. The Site is also listed on the RCRA NonGen / NLR database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	1,004-ft/Northwest	Up-gradient	M106	EPA ID: NYD986903763. The Site is also listed on the RCRA NonGen / NLR database. The facility is a retail gasoline filling station.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NY Manifest facilities are expected to impact the environmental integrity of the Site.

NJ Manifest

The NJ Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the NJ Manifest database.

Three (3) NJ Manifest facilities were identified within one-quarter mile of the Site. The following NJ Manifest facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCT 165-18 South Road Jamaica, NY 11433	840- ft/Northwest	Cross-gradient	J92	The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NJ Manifest facilities are expected to impact the environmental integrity of the Site.

RI Manifest

The RI Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the RI Manifest database.

One (1) RI Manifest facility was identified within one-quarter mile of the Site. The following RI Manifest facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCT 165-18 South Road Jamaica, NY 11433	840- ft/Northwest	Cross-gradient	J92	The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Manufactured Gas Plant Sites (Coal Gas)

Manufactured gas sites were used in the United States from the 1800's to the 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water and produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils, and other compounds are potentially hazardous to human health and the environment. The byproducts were frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination. The Manufactured Gas Plant (MGP) Sites database was researched to identify any listings for the Site and within a one-mile radius of the Site. The Site is not listed in the MGP database.

One (1) facility within one mile of the Site is listed in the MGP database. The facility is identified as Jamaica Gas and Light and is located approximately 3,305-ft west of the Site at Beaver Road and 158th Street. Due to its distance from the Site and/or the presumed groundwater flow direction this facility is not considered a REC/VEC with respect to the Site.

Orphan Listings
A review of the Orphan Listings in the database search report indicated a total of four (4) listings. The Orphan sites are not considered RECs based on their estimated distances from the Site (none adjacent or on the Site block) and/or the nature of the activity/release.

6.2 Local Regulatory Agency Research

A review of local records for the Site was accomplished by contacting offices of New York City regulatory agencies including the NYCDOB, NYCDEP, Department of Health and Mental Hygiene (NYCDOHMH), NYCDCP, and the Fire Department (FDNY). The results of the review of local records are presented below. Copies of the correspondences are included in *Appendix K.*

New York City Department of Buildings (NYCDOB)
NYCDOB records were reviewed on November 13, 2015 to determine whether there are references to buildings, tanks or other structures, property use or inspection reports that indicate the presence, past use, or release of hazardous substances, wastes, or petroleum products at the Site. The NYCDOB records review indicated that the Site has two (2) NYCDOB violations, both of which were closed or dismissed. There were no RECs identified as a result of review of NYCDOB records. Copies of the NYCDOB records are included in *Appendix J*.

New York City Department of Environmental Protection (NYCDEP)
The NYCDEP maintains files of incidents involving environmentally regulated materials. The records maintained by NYCDEP include reports of spills of hazardous chemicals and citizen's complaints on environmental issues. NYCDEP information concerning the Site was requested in a formal application for records dated October 1, 2015. At the time this report was issued, STV had not yet received a response from NYCDEP. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of Health and Mental Hygiene (NYCDOHMH)
The NYCDOHMH, Bureau of Environmental Investigations (BEI) maintains files of health-related environmental incidents in the City of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYCDOHMH information concerning the Site was requested in a formal FOIL request form dated October 1, 2015. NYCDOHMH acknowledged the request on October 6, 2015. At the time this report was issued, STV had not yet received any response from NYCDOHMH. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of City Planning (NYCDCP)
STV reviewed the NYCDCP Zoning Map 14d, available via the NYCDCP on-line web-site. According to the map, the Site is currently located within zone “M1-1”, which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

"E" designations for blocks or lots on city zoning maps were issued since approximately March 2003 and indicate that potential environmental issues are associated with these parcels. The environmental issues may or may not be associated with potential contamination by hazardous or petroleum substances. Parcels with "E" designations require that the fee owner of the site conduct a testing and sampling protocol, and remediation where appropriate, to the satisfaction of the New York City Office of Environmental Remediation (NYCOER) before the issuance of a building permit by the NYCDOB pursuant to the provisions of Section 11-15 of the Zoning Resolution (Environmental Requirements).

The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing for the Site for hazardous materials is considered to be a REC/VEC.

New York City Fire Department (FDNY)

The FDNY maintains information concerning petroleum USTs. STV submitted a Fuel Oil Record Search Request Form to the FDNY on October 1, 2015 for information concerning the Site. At the time this report was issued, STV had not yet received a response from FDNY. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

7.0 USER RESPONSIBILITIES

7.1 Environmental Liens or Activity and Use Limitations

An Environmental Lien Search Report was obtained from EDR for the Site. The Environmental Lien Search Report provides results from a search of available and current land title records for environmental liens and other activity and use limitations, such as engineering controls and institutional controls. A review of the report indicates that no environmental liens or other activity and use limitations were found for the Site. A copy of the environmental lien search report is included in *Appendix J*.

7.2 Valuation Reduction for Environmental Issues

No information was available at the time of the assessment regarding the relationship of the purchase price of the property to the fair market value of the property. If information is received regarding valuation reduction for environmental issues which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.3 Knowledge or Experience of the User

No person with specialized knowledge or experience that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.4 Commonly Known or Reasonably Ascertainable Information

No person within the local community with commonly known or reasonably ascertainable information about the property that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.5 The Degree of Obviousness of the Presence or Likely Presence of Contamination at the Property

NYCT is not currently aware of any obvious indicators that point to the presence or likely presence of new or imminent releases at the property. Additionally, NYCT is not currently aware of any obvious indicators important to the screening of VECs in connection with the property.

8.0 SITE RECONNAISSANCE AND INTERVIEWS

8.1 Methodology and Limiting Conditions

The inspection of the Site included observations of the property and surrounding area (Site reconnaissance) that were made to identify potential sources or indications of hazardous substances, including: ASTs; USTs; tank vents and fill ports; transformers and other items that could contain PCBs; waste storage areas; hazardous materials usage, storage, and disposal; stained surfaces and soils; stressed vegetation; leaks; and, odors. In addition, readily-observable portions of the properties immediately adjacent to the Site were viewed from public rights-of-way to identify or determine the likelihood of any of the aforementioned potential sources of contamination being present. There were no limiting conditions with respect to impact on the accuracy of the Site reconnaissance.

8.2 Site Reconnaissance

Mr. Doane Cafferty of STV performed the Site visit on November 12, 2015. A request for access to the Site was communicated in a letter dated October 27, 2015 that was mailed to Mr. Henry Lewis. At the time this visit was conducted, STV had not yet received a response Mr. Lewis. Consequently, the site inspection was conducted from the public sidewalk in front of the Site. At the time of the inspection, the weather was approximately 50º F with sunny skies. The weather did not prevent STV from conducting a thorough inspection of the Site and surrounding areas. *Appendix C* provides representative photographs of the Site.

Block 10164, Lot 89 is an approximately 2,000 square-foot (sf) property that contains a three-story building constructed in 1931. The ground floor was formerly occupied by a grocery store and is currently vacant. The second and third floors are occupied by residential dwellings.

The Site is bound to the north by bus depot parking lots followed by a one-story commercial office building and subsequently by a parking lot, custom wheel, tire, and rim supply and repair shop and several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south an auto collision repair shop and subsequently 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street.

8.3 Current and Historical Use Interviews

The following knowledgeable persons were interviewed with regard to the Site pursuant to ASTM 1527-13 Section 10:

8.3.1 Current Property Owner

The subject property is currently owned by 'Elna L. Lewis'. Based on the research, this entity has owned the Site since at least 2003. All prior ownership information reviewed is presented in *Appendix J*. The review of current and historical ownership and tax records information did not reveal evidence of RECs or VECs associated with prior use of the Site.

8.3.2 Current Site Operator or Key Site Manager

Name	Title/Company	Years Associated with Site
Mr. Henry Lewis	Owner	Approx. 12

Detailed information provided during the above-listed interview is documented on Record of Communication forms in *Appendix K*.

8.3.3 Site Occupants

Other than the Owner's representative, Site occupants were not available to interview during this assessment.

8.3.4 Past Owners, Operators and Occupants

Past owners or occupants of the Site were not available to interview during this assessment. STV was unable to obtain contact information from any previous owners or occupants.

8.3.5 Report User

Name	Title/Company	Years Associated with Site
Mr. Emil Dul	NYCT Real Estate Department	<1

According to the ASTM E 1527-13 User Questionnaire provided by Mr. Emil Dul of NYCT's Real Estate Department, NYCT is not aware of any environmental liens, land use limitations, specialized knowledge, or past uses of the Site. Detailed information provided during the above-listed interviews is referenced in applicable sections of this report and a copy of the completed ASTM E1527-13 User Questionnaire is included in *Appendix K*.

8.4 Hazardous Substances and Petroleum Products Storage and Handling

8.4.1 Hazardous Substances

No hazardous substances were stored or located on the Site within view from the sidewalk areas. There was no visual or olfactory evidence of leakage or staining anywhere on the Site that was visible from the sidewalk areas. STV concludes that storage and handling of hazardous substances do not presently represent a REC or VEC for the Site.

8.4.2 Petroleum Products Storage and Handling

No evidence of petroleum product storage was observed at the Site within view from the sidewalk areas. STV concludes that storage and handling of petroleum products do not presently represent a REC or VEC for the Site.

8.5 Solid Waste Generation, Storage and Disposal

No containers for solid waste were observed on the Site. Solid waste generation, storage, and disposal are not considered a REC or a VEC with respect to the Site.

8.6 Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are toxic components of various products including, but not limited to caulking materials, light ballasts, and dielectric and hydraulic fluids that were formerly used in electrical equipment such as transformers and hydraulic elevators/lifts. The manufacture and use of PCBs was banned in the United States in 1978.

STV did not observe any electrical transformers on or adjacent to the Site. Potential buried structures, historic fill, fluorescent lighting fixtures, and window caulking on the property could include PCB-containing materials and is considered an environmental concern with respect to the Site.

8.7 Asbestos-Containing Material (ACM)

STV conducted a limited visual survey (i.e., within accessible areas only) for the presence of suspect ACM within the Site. The intent of the survey was to identify exposed suspect ACM through preliminary non-destructive observations. No sampling of suspect ACM was performed during this investigation. Pursuant to applicable asbestos control regulations and guidelines, STV considered any observed suspect materials to be asbestos-containing.

Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect ACM.

8.8 Lead-Based Paint (LBP) Survey

During the Site inspection, a limited visual assessment of all accessible painted surfaces was performed. No sampling or intrusive work was performed as this is outside the scope of work of this assessment. All painted surfaces are assumed to be LBP.

Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.

8.9 Regulatory Compliance

STV does not consider regulatory compliance to be an environmental concern for the Site.

8.10 Electromagnetic Fields

A visual inspection was performed for the presence of high voltage power lines and or substations located in close proximity to the Site. No such power lines or substations were identified; therefore, STV does not consider electromagnetic fields to be an environmental concern at the Site.

8.11 Other Environmental Concerns (Methane, Mold, etc.)

Based on a review of the historic topographic map and knowledge of the area, the Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site.

As part of this assessment, STV conducted a limited assessment for the presence of water damage and odors, indicative of the potential for mold growth, on accessible surfaces within the Site. There was no evidence of water damage or mold noted during the Site inspection.

9.0 SUMMARY OF FINDINGS

The Site is located at 105-22 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 89). Block 10164, Lot 89 is an approximately 2,000 square-foot (sf) property that contains a three-story building constructed in 1931. The ground floor was formerly occupied by a delicatessen and is currently vacant. The second and third floors are occupied by residential dwellings.

The Site is bound to the north by bus depot parking lots followed by a one-story commercial office building and subsequently by a parking lot, custom wheel, tire, and rim supply and repair shop and several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south an auto collision repair shop and subsequently 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street.

NYCDCP Zoning Map 14d indicated the Site is designated as zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol).

The Site is generally flat and the topography of the surrounding area slopes to the south-southeast. According to the USGS 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, and information contained in the regulatory agency database report, the Site elevation is approximately 28 feet amsl.

The nearest surface water body is a pond in Captain Tilly Park, located approximately 4,600 feet north-northwest of the Site. Based on topography, the groundwater flow in the area of the Site is assumed to be south-southwest towards Jamaica Bay. The depth to groundwater is estimated to range from approximately 20-25 feet bgs.

The Phase I ESA identified on-Site RECs pertaining to the historic use of the Site as an upholstery shop and the Site's listing with an E-Designation for underground storage tanks testing protocol.

Off-site RECs include three solid waste management facilities; a nearby facility with an open spill; one facility that currently generates spent halogenated solvents; one facility that historically generated cadmium, lead, and waste oils; an active gas station; several historical and current auto repair facilities; one historic dry cleaner; several nearby properties with E-Designation listings for underground storage tanks testing protocol; and the historical presence of a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs in close proximity to the Site. The Phase I ESA revealed environmental concerns associated with suspect ACM, LBP, PCB-containing materials.

10.0 CONCLUSIONS AND RECOMMENDATIONS

STV has performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527-13 and the requirements of NYCT. Any additions to, exceptions to, or deletions from this practice are described in Section 2.0 of this report.

The Phase I ESA has revealed the following RECs, CRECs, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The historic use of the Site as an upholstery shop is considered a REC/VEC.

- The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that generates spent halogenated solvents is located in close proximity to the Site and is considered a REC/VEC.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- A facility with an open spill is located northwest of the Site at 165-18 South Road. This property is considered a REC/VEC based on its proximity to the Site and hydraulically cross-gradient position with respect to the Site.

- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect ACM.
- Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.
- Potential buried structures, historic fill, fluorescent lighting fixtures, and window caulking may contain PCBs.

Recommendations

STV recommends that any ACM, LBP, and/or PCB-containing materials affected by future renovations, repairs or demolition at the Site be identified and properly managed during such activities. If the NYCT considers purchasing the property in the future, or if future development requires soil disturbance, a comprehensive Phase II Environmental Site Investigation should be conducted.

11.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

STV Incorporated (STV) has performed a Phase I ESA of the property located at 105-22 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 89). The scope of the Phase I ESA was consistent with the requirements of ASTM Standard Practice E 1527-13 and of NYCT. Signatures of the Environmental Professionals who participated in conducting this Phase I ESA are provided below. Qualifications for these individuals are provided in *Appendix L*. STV declares that to the best of their professional knowledge and belief, they meet(s) the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. STV has the specific qualifications based on education, training and experience to assess the subject property. STV has developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

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Prepared By:
Doane E. Cafferty, LEED AP BD+C
Senior Environmental Scientist

_____

Reviewed By:
Christine Vilardi, P.G., LEED Green Associate
Quality Control Officer

_____

Reviewed By:
Peter S. Helseth, P.E.
Senior Project Manager

12.0 REFERENCES

Persons Interviewed:

- Mr. Henry Lewis, Owner, 105-22 Merrick Blvd., Jamaica, Queens, New York, DATE TBD.

Resources Consulted:

- EDR – Radius Map™ Report with GeoCheck®, September 29, 2015.
- EDR – Historical Sanborn® Maps: 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006.
- EDR – Aerial Photographs: 1924, 1951, 1954, 1961, 1966, 1975, 1984, 1994, 2006, 2009, and 2011.
- EDR – USGS Historical Topographic Maps: 1900, 1924, 1947, 1957, 1966, 1979, and 1994.
- EDR – City Directories: 1922, 1934, 1939, 1945, 1950, 1962, 1967, 1970, 1976, 1983, 1991, 1996, 2000, 2005, 2008, and 2013.
- EDR - Environmental Lien Search dated September 30, 2015.
- NYC Department of Finance – Assessment Roll: 2006-2015.
- Oasis Website - www.oasisnyc.net/OASISMap.htm.
- FEMA Map Services Center Website - www.msc.fema.gov
- National Wetlands Inventory Website - www.fws.gov/nwi/
- USGS New York Water Science Center http://ny.ims.er.usgs.gov/li-dtw/ and http://ny.ims.er.usgs.gov/LI_maps06

Regulatory Agencies Contacted:

- New York City Department of Buildings, October 1, 2015.
- New York City Fire Department, October 1, 2015.
- New York City Planning and Zoning Department, October 1, 2015.
- New York City Department of Environmental Protection, October 1, 2015.
- New York City Department of Health and Mental Hygiene, October 1, 2015.
- New York State Environmental Conservation, October 1, 2015.
- New York State Department of Health, October 1, 2015.
- Unites States Environmental Protection Agency, October 1, 2015.

Documents and Maps:

- ASTM International (ASTM) 2013, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," ASTM Designation E 1527-13.
- ASTM E 2600-10 "Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions."
- STV Potential Property Acquisition Eight Properties Near Jamaica Bus Depot, Jamaica, New York, dated February 17, 2012.
- U.S. Geological Survey, Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, Charles Baskerville, 1994. USGS I 2306.
- U.S. Geological Survey, Groundwater in Bronx, New York and Richmond Counties with Summary Data on Kings and Queens Counties, New York City, New York, Nathaniel Perlmutter and Theodore Arnow, 1953. USGS 6W-32.

- Water Supply Paper 2498 (USGS 1999) Ground-Water Resources of Kings and Queens Counties, Long Island, New York by Herbert Buxton and Peter Schernoff.
- USGS LI Depth-to Water Tool for Long Island (USGS, 2013).

13.0 APPENDICES

Appendix A - Site Location Map
Appendix B - Site Plan
Appendix C - Site Photographs
Appendix D - National Wetlands Inventory Map
Appendix E - FEMA Flood Insurance Rate Map
Appendix F - Historical Topographic Maps
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Phase I ESA - 106-04 Merrick Boulevard

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PHASE I ENVIRONMENTAL SITE ASSESSMENT
OF

106-04 MERRICK BOULEVARD
BLOCK 10164, LOT 90
JAMAICA, QUEENS, NEW YORK 11433

CONTRACT NO.: CM-1411/D-61162
TASK ORDER NO.: 24
CONSULTANT PROJECT NO.: 30-17749-0001

AUGUST 24, 2016

Prepared by:

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1.0 EXECUTIVE SUMMARY

At the request of New York City Transit (NYCT), STV Incorporated (STV) conducted a Phase I Environmental Site Assessment (ESA) of the property located at 106-04 Merrick Boulevard, Jamaica, Queens, New York 11433 (hereafter referred to as the "Site"). The legal description of the Site is Block 10164, Lot 90. NYCT is evaluating the feasibility of acquiring the Site for the Jamaica Bus Depot reconstruction.

Block 10164, Lot 90 is an approximately 9,406 square-foot (sf) property that contains a one-story building constructed in 1931. The building has two units. The northern unit is currently occupied by First World Auto Repair and the southern unit is currently occupied by Calvin Auto Body. The Site is owned by "Bauerschmidt Realty Holding Corp." according to the Environmental Data Resources (EDR) Environmental Lien Search. Historically, the Site was occupied by a woodworking factory and an auto repair facility. The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

The main objective of the Phase I ESA is to identify *recognized environmental conditions (RECs)* and environmental concerns that may affect the suitability of the Site for acquisition and redevelopment. RECs are defined in ASTM International (ASTM) Standard Practice E 1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property. Note that *controlled recognized environmental conditions (CRECs)* are considered to be RECs and are listed in the Executive Summary and Conclusions of this Phase I ESA. Additionally, *vapor encroachment conditions (VECs)* were evaluated as per ASTM E 2600-10.

Other environmental issues and conditions that, in the opinion of the *environmental professional* conducting the assessment, would not be considered *RECs* are identified in this assessment. These may include *historical RECs* and/or *de minimis* conditions. The Phase I ESA also includes a preliminary evaluation of specific potential environmental issues or conditions that are, according to ASTM E 1527-13, considered non-scope considerations. These issues include radon, asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing light ballasts and caulking materials, exterior lead-based paint (LBP), chemical storage, wetlands, regulatory compliance issues, dry cleaner and other industrial emissions, mold, biological agents, electromagnetic fields, and methane. The Phase I ESA included a review of Federal, State, and local records, previous reports and historical documents; visual observation of the Site and adjoining properties; and, interviews with selected Site representatives.

The assessment requested by NYCT is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included evaluation of the following: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-site solid waste management and disposal practices; on-site hazardous materials and petroleum products management; chemical storage, ACM, PCBs and exterior LBP management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions; radon; mold and moisture intrusion; biological agents; electromagnetic fields; and, potential for methane generating materials.

Summary of RECs, CRECs, VECs and Environmental Concerns

This Phase I ESA has revealed the following RECs, CRECS, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The current and historical use of the Site as an auto repair facility is considered a REC/VEC.

- The historical use of the Site as a woodworking finishing facility is considered a REC/VEC.

- The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that generates spent halogenated solvents is located in close proximity to the Site and is considered a REC/VEC.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- A facility with an open spill is located northwest of the Site at 165-18 South Road. This property is considered a REC/VEC based on its proximity to the Site and hydraulically cross-gradient position with respect to the Site.

- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect ACM.
- Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.
- Potential buried structures, historic fill, fluorescent lighting fixtures, and window caulking may contain PCBs.

STV recommends that any ACM, LBP, and/or PCB-containing materials affected by future renovations, repairs or demolition at the Site be identified and properly managed during such activities. If the NYCT considers purchasing the property in the future, or if future development requires soil disturbance, a comprehensive Phase II Environmental Site Investigation should be conducted.

2.0 INTRODUCTION

This report summarizes the results of the Phase I Environmental Site Assessment (ESA) of the property located at 106-04 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 89) (hereafter referred to as the "Site"). Block 10164, Lot 90 is an approximately 9,406 square-foot (sf) property that contains a one-story building constructed in 1931. The building has two units. The northern unit is currently occupied by First World Auto Repair and the southern unit is currently occupied by Calvin Auto Body. NYCT is evaluating the feasibility of acquiring the Site for the Jamaica Bus Depot reconstruction.

The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

Mr. Doane Cafferty of STV performed the Site visit on November 12, 2015. A request for access to the Site was communicated in a letter dated October 27, 2015 that was mailed to Mr. Fred Bauerschmidt (the property owner). At the time this visit was conducted, STV had not yet received a response from Mr. Bauerschmidt. Consequently, the site inspection was conducted from the public sidewalk in front of the Site. The weather was approximately 50º F with sunny skies; there were no limitations caused by the weather.

2.1 Selected Definitions

The following terms are used throughout this report and, for the purpose of clarity, corresponding definitions are provided. These terms are fully defined in ASTM E 1527-13 and ASTM E 2600-10.

Controlled Recognized Environmental Condition (CREC) – A recognized environmental condition resulting from a past *release* of *hazardous substances* or *petroleum products* that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority) with *hazardous substances* or *petroleum products* allowed to remain in place subject to the implementation of required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Historical Recognized Environmental Condition (HREC) – A past *release* of any *hazardous substances* or *petroleum products* that occurred in connection with the *property* and has been addressed to the satisfaction of the applicable regulatory authority, without subjecting the *property* to any required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Recognized Environmental Condition (REC) – The presence or likely presence of any *hazardous substances* or *petroleum products* in, on, or at a *property:* (1) due to any *release* to the *environment*; (2) under conditions indicative of a *release* to the *environment*; or, (3) under conditions that pose a *material threat* of a future *release* to the *environment*.

Environmental Professional - A person meeting the education, training, and experience requirements as set forth in 40 CFR § 312.10(b), necessary to conduct a *site reconnaissanc*e, *interview*s, and other activities in accordance with this practice, and from the information generated by such activities, having the ability to develop opinions and conclusions regarding conditions indicative of releases or threatened

releases on, at, in, or to a property, sufficient to meet the objectives and performance factors in 40 CFR § 312.20(e) and (f).

Vapor Encroachment Condition (VEC) - The presence or likely presence of chemical of concern vapors in the subsurface of the target property caused by the release of vapors from contaminated soil or groundwater or both either on or near the target property.

2.2 Purpose and Scope

The purpose of this assessment is to identify RECs, CRECs, VECs, and certain other environmental issues or concerns as they existed at the Site at the time of the Site visit. The assessment is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser, or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included, but was not limited to an assessment of the following potential environmental issues: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-Site solid waste management and disposal practices; on-Site hazardous materials and petroleum products management; asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing equipment and lead-based paint (LBP) management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions, radon, mold and moisture intrusion; biological agents; electromagnetic fields; and the potential for methane generating materials.

This evaluation was conducted by qualified *environmental professionals* utilizing a standard of good commercial and customary practice in accordance with ASTM E 1527-13. The scope of work completed for this evaluation meets all requirements of ASTM E 1527-13 and includes the following:

- Documenting the physical characteristics of the Site through a review of available topographic, geologic, wetland, flood plain, groundwater data and Site observations.

- Researching the Site history through a review of reasonably ascertainable standard sources such as land deeds, fire insurance maps, city directories, aerial photographs, prior reports and interviews.

- Documenting current Site conditions, via observations and interviews, regarding the presence or absence of hazardous substances/petroleum products; the generation, treatment, storage, or disposal of hazardous, regulated, or medical wastes; the presence of electrical equipment that utilizes oils which potentially contain PCBs; and, the presence of storage tanks (above and below ground), floor drains, drains that discharge to subsurface, former septic tanks and drywells.

- Determining the usage of adjoining and nearby properties to identify the likelihood for environmental conditions (if present and/or suspected) and concerns to migrate onto the Site.

- Evaluating information contained within Federal and State environmental databases and other local environmental records, within specific search distances.

2.3 Additions, Deviations, Deletions, Data Failures, and Data Gaps

The following environmental issues that are outside the scope of (additions to) ASTM E 1527-13 were evaluated:

- A review of available radon data for the Site vicinity.
- A review of available wetlands data.
- A visual assessment for water damage and mold.
- A visual assessment for suspect ACM.
- A visual assessment for suspect LBP.
- An assessment of potential methane generation on-Site or migration to the Site.
- Regulatory compliance.
- PCB light ballasts and caulking materials.
- Biological agents (mold, pigeon guano, medical wastes, etc.).
- Air emissions from drycleaners and other industrial sources.
- An assessment of the potential presence of electromagnetic fields (EMF).
- An assessment of any dust generating activities on or near the Site.

The following deviations, data gaps and deletions from ASTM E 1527-13 were necessary in conducting this assessment:

- The Site area history was not conducted in five-year intervals. However, sufficient information about the history of the Site and surrounding area could be obtained from the available historical fire insurance maps, aerial photographs, city directories, and local records and this data gap is not likely to alter the conclusions of this report.
- The Site reconnaissance was conducted from the sidewalk area in front of the Site because access was not granted by the owner or a representative of the owner at the time of the inspection.

2.4 Limitations and Exceptions

STV has prepared this Phase I ESA using reasonable efforts in each phase of its work to identify RECs associated with hazardous substances, wastes and petroleum products at the Site. The methodology of the Phase I ESA was consistent with the ASTM E 1527-13. Findings within this report are based on information collected from observations made on the day of the Site investigation and from reasonably ascertainable information obtained from governing public agencies and private sources.

This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation, or other construction purposes. STV makes no representation or warranty that the past or current operations at the Site are or have been in compliance with all applicable Federal, State and local laws, regulations and codes.

Regardless of the findings stated in this report, STV is not responsible for consequences or conditions arising from facts that were concealed, withheld, or not fully disclosed at the time the evaluation was conducted.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The regulatory database report provided is based on an evaluation of the data collected and compiled by a contracted data research company. The report focuses on the Site and neighboring properties that could impact the Site. Neighboring properties listed in governmental environmental records are identified within specific search distances. The search distance varies depending upon the particular government

record being checked. The regulatory research is designed to meet the requirements of ASTM E 1527-13. The information provided in the regulatory database report is assumed to be correct and complete.

3.0 SITE DESCRIPTION

3.1 Site Location and Legal Description

The Site is located at 106-04 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 90). Block 10164, Lot 90 is an approximately 9,406 square-foot (sf) property that contains a one-story building constructed in 1931. The building has two units. The northern unit is currently occupied by First World Auto Repair and the southern unit is currently occupied by Calvin Auto Body.

The Site is located in the Jamaica neighborhood of Queens. The Site is "E" designated according to the New York City Department of City Planning (NYCDCP) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). A map showing the location of the Site is presented in *Appendix A*. A Site Plan showing the Site's physical layout including adjacent land use is presented in *Appendix B*. Photographs of the Site and surrounding areas are included in *Appendix C*.

The Site is bound to the north by a mixed-use residential/commercial building followed by bus depot parking lots, a one-story commercial office building, a parking lot, custom wheel, tire, and rim supply and repair shop and several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south by 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street. No changes to the Site were observed since the most recent Sanborn Map (2006).

The surrounding area is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR.

According to information obtained through the New York City Department of City Planning (NYCDCP) website, the Site is currently located within zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

3.2 Physical Setting

3.2.1 Topography

According to the United States Geological Survey (USGS) 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, the elevation of the Site is approximately 28 feet above mean sea level (amsl). The topography of the immediate Site area was observed to be sloping to the south-southeast. A copy of the topographic map is presented in *Appendix A*.

3.2.2 Geology

The geology of Queens County can be characterized as a wedge-shaped layer of Cretaceous and Pleistocene unconsolidated sediments, thickening to the south-southeast. Several impermeable clay layers are found within this sediment package, generally creating three distinct aquifers. Consolidated crystalline bedrock is of Precambrian age. The thickness of the unconsolidated sequence ranges from zero to approximately 1,300 feet below ground surface (bgs) from north to south. The southernmost portions of Queens, including portions of the Rockaways, consist of glaciofluvial sediments derived from melt-water of

the retreating glaciers. Depth to bedrock within the vicinity of the Site is at least 600 feet bgs (as per "Ground-Water Resources of Kings and Queens Counties, Long Island, New York, by Herbert Buxton and Peter Schernoff, dated 1999).

3.2.3 Soils

According to the GeoCheck Section of the regulatory agency database report (*Appendix I*), the soil in the area of the Site is described as Urban Land. Urban Land refers to soils that have been altered by human activities thus making them unidentifiable. Typically, these soils have been mixed with other materials, such as brick and concrete (urban fill), and characteristics can only be determined by on-site investigation. Other surficial soil types in the area of the Site consist of silt loam, loamy sand, sandy loam, and fine sandy loam. Sandy loam refers to a soil that's made of sand, silt, and clay.

3.2.4 Hydrology

Generally, groundwater contour lines mimic the surface topography and groundwater flow direction is perpendicular to these contour lines flowing from higher to lower elevation. According to USGS digital elevation data provided by Environmental Data Resources, Inc. (EDR) of Milford, Connecticut (*Appendix I*) and the USGS 7.5-minute Quadrangle map, *Jamaica, NY*, 2013, groundwater in the vicinity of the Site is inferred to flow to the south-southwest towards Jamaica Bay. According to "Water Table Altitude in Kings and Queens Counties, New York in March 1997" (USGS, 1997) depth to groundwater is anticipated to range from approximately 20 to 25 feet bgs. Estimated groundwater levels and/or flow direction(s) may vary due to seasonal fluctuations in precipitation, local usage demands, geology, underground structures, or dewatering operations. The groundwater in the vicinity of the Site is not known to be used for human consumption, as most potable water in the area is derived from upstate reservoirs managed by New York City; the Site area is serviced by the City water supply.

STV did not observe any retention ponds or other surface water bodies on the Site. The nearest surface water body is a pond in Captain Tilly Park, located approximately 5,045 feet north-northwest of the Site. Another pond, Baisley Pond, is located approximately 1.35 miles south of the Site. Bergen Basin, an inlet off Jamaica Bay, is located approximately 3.0 miles south-southwest of the Site.

STV reviewed the United States Fish and Wildlife Service National Wetlands Inventory (NWI) map for the area of the Site (http://www.fws.gov/wetlands/data/index.html) to determine if the Site is located in a regulated wetlands area. Based on a review of the map, the Site is not located within a regulated wetlands area. A copy of the wetlands map is included in *Appendix D*.

The Federal Emergency Management Agency (FEMA) Region II Coastal Analysis and Mapping Preliminary Flood Maps & Data website (http://www.region2coastal.com/view-flood-maps-data/view-preliminary-flood-map-data/) was reviewed to assess whether the Site is located within a designated flood plain or flood zone. According to the revised preliminary FIRM Panel 3604970233G (effective date January 30, 2015), the Site is not located within a 100-year flood zone; therefore, this does not represent an environmental concern for the Site. A copy of the flood insurance map for the Site area is included in *Appendix E*.

Stormwater is collected from catch basins located on paved areas of the Site and the surrounding streets and is conveyed into the NYCDEP combined storm/sanitary sewer system.

3.2.5 Radon

Radon is a colorless, odorless radioactive gas that results from the natural breakdown of uranium minerals in soil, rock, and water, which subsequently enters the atmosphere. It can concentrate in buildings, entering through cracks and other penetrations of a building foundation. Some areas are more likely to have elevated concentrations of radon than others, reflecting subsurface lithologic conditions.

The New York State Department of Health (NYSDOH) maintains a database of radon test results on a local and county level. According to the NYSDOH, 527 radon tests have been conducted in basements in Queens County. The average radon level was found to be 1.20 picoCuries per liter (pCi/L). According to Federal Area Radon Information presented in the EDR report (*Appendix I*), radon concentrations were tested at 81 locations in Queens County. The average radon concentration in Queens County, New York was 0.620 pCi/L in living areas tested and 0.970 pCi/L in basements tested. In addition, Queens County is in United States Environmental Protection Agency (USEPA) Radon Zone 3, where the indoor average radon level is less than 2 pCi/L. These results are below the USEPA Action Level of 4.0 pCi/L; therefore, STV concludes that it is unlikely that elevated levels of radon gas are present at the Site.

4.0 ADJOINING AND SURROUNDING PROPERTIES

The area surrounding the Site is primarily characterized low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR. The following table summarizes the adjoining site uses:

Direction	Facility Name/Description	Street Address/Location	Current Use
North	Res/Commercial, Commercial Office, Parking, Industrial/ Manufacturing	105-22 Merrick Blvd. 105-14 Merrick Blvd. 105-12 Merrick Blvd 105-02 Merrick Blvd. 104-32 Merrick Blvd. 104-28 Merrick Blvd. 104-22 Merrick Blvd. 104-12 Merrick Blvd. 104-10 Merrick Blvd. 104-02 Merrick Blvd.	Deli (closed) and Residences Parking Lot Parking Lot Domino's Pizza/Appliance Repair Parking Lot RVM Wheels Vacant Manufacturing Facility Vacant Manufacturing Facility Vacant Manufacturing Facility Vacant Manufacturing Facility
East	Merrick Blvd. followed by Transportation/Utility and Parking and Retail Gasoline Sales	Merrick Blvd. 104-15 Merrick Blvd. 104-19 Merrick Blvd. 105-09 Merrick Blvd. 105-15 Merrick Blvd.	Public Street Sports Line Auto Repairs Auto repair facility (parking) Inter City Tire (truck tire center) BP Gas Station
South	107th Avenue	107th Avenue	Public Street
West	Transportation/Utility	165-18 South Road	Jamaica Bus Depot

Based on our inspection of the adjacent and surrounding properties, the following off-site RECs/VECs were identified:

- Several auto repair facilities are located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- One (1) active gasoline filling station is located in the area surrounding the Site. This property is considered a REC/VEC based on its proximity to the Site.

5.0 HISTORICAL USE RESEARCH

5.1 Land Title Records and Tax Records

STV researched prior ownership information for the Site at the New York City Department of Finance (DOF) website. In addition, prior ownership information was researched through EDR's Environmental Lien Search and the New York City Department of Buildings (NYCDOB) Automated City Register Information System (ACRIS) on-line website. The subject property is currently owned by "Bauerschmidt Realty Holding Corp". Based on the research, this entity has owned the Site since at least 1994. No environmental liens were identified for the Site. All prior ownership information reviewed is presented in *Appendix J*. The review of current and historical ownership and tax records information revealed that the Site was used as an auto repair shop which is considered a REC/VEC.

5.2 Historical USGS Topographic Quadrangles

STV reviewed available historical USGS Topographic Quadrangles for information regarding past uses of the Site and surrounding area. Topographic maps for the Brooklyn quadrangle were obtained for the following years: 1900 and 1924. Topographic maps for the Jamaica quadrangle were obtained for the following years: 1947, 1957, 1966, 1979, and 1994. The following table presents descriptions and interpretations from historical USGS topographic map review.

Year (Scale and Quadrangle)	Comments
1900 (1:62,500) Brooklyn	**Site:** The Site appears to be located amongst developed streets. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** Surrounding properties appear to be located amongst developed streets. The Long Island Railroad (LIRR) tracks are depicted to the north of the Site. A pond is depicted west-southwest of the Site on the south side of the LIRR tracks. The area a few blocks south of the Site appears as undeveloped land with only a few roadways present, rail lines, and a pond and wetlands area. Due to scale of the map, no further information can be obtained.
1924 (1:62,500) Brooklyn	**Site:** No significant changes are apparent to the Site property from the 1900 topographic map. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** No significant changes are apparent to the Site property from the 1900 topographic map. Due to scale of the map, no further information can be obtained.
1947 (1:25,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1924 topographic map. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** The areas north, east, south, and west of the Site have been significantly developed with streets and structures. A long building is depicted northwest of the Site on the same block. Prospect Cemetery is identified west of the Site on the south side of the LIRR tracks where a pond was previously depicted. The Jamaica Station is located west-northwest of the Site. Water Supply Company Tank No. 2 is located east of the Site. Baisleys Pond is depicted several blocks south of the Site. The Contagious Disease Hospital and Queens General Hospital are located northwest of the Site on the south side of Union Turnpike.

Year (Scale and Quadrangle)	Comments
1957 (1:24,000) Jamaica	**Site:** Elevation contour lines are depicted on the map and show the Site is approximately 30 feet amsl. No other significant changes are apparent to the Site property from the 1947 topographic map. **Surrounding Properties:** An Armory is identified several blocks north of the Site on the north side of the LIRR tracks. Water pumping stations are located east and south of the Site. A water tower is depicted west of Site in the immediate vicinity of Prospect Cemetery. The LIRR Hillside Support Facility is depicted to the east of the Site. St. Albans Naval Hospital is located southeast of the Site. No other significant changes are apparent to the surrounding properties from the 1947 topographic map.
1966 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1957 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1957 topographic map.
1979 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1966 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1966 topographic map except the water tower that was west of Site near Prospect Cemetery is no longer depicted.
1994 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1979 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1979 topographic map.

Based on STV's review of historical topographic maps, the Site appears to be amongst developed streets as early as 1900. No evidence of filling was noted on the Site property. The Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site. The review of historical USGS Topographic Quadrangles did not indicate RECs, CRECs, HRECs, or VECs at the Site or surrounding areas. Copies of historical USGS Topographic Maps are included in *Appendix F*.

5.3 Historical Aerial Photographs

STV reviewed historical aerial photographs of the Site and surrounding areas provided by EDR in order to identify historical land use that may have involved hazardous substances and petroleum products. Aerial photographs were obtained for the following years: 1924, 1951, 1954, 1961, 1966, 1975, 1984, 1994, 2006, 2009, and 2011. The following table summarizes descriptions and interpretations from the historical aerial photograph reviews:

Year	Comments
1924 1" – 500'	**Site:** The Site appears to be developed with a structure. Due to the scale of the photograph, no further details can be discerned. **Surrounding Properties:** The areas adjacent to the Site to the east and south appear to be developed with multiple structures. The area north of the Site appears to be developed with a structure. A long building is visible northwest of the Site on the same block. Railroad tracks are depicted to the north. Due to scale of the photograph, no further details can be discerned.

Year	Comments
1951 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1924 aerial photograph. **Surrounding Properties:** The areas adjacent to the Site to the east and south appear to be developed with multiple structures. The area north of the Site appears to be developed with a structure. A long building is visible directly northwest of the Site on the same block. Railroad tracks are depicted to the north. A large water tank is located south of the Site. Due to scale of the photograph, no further details can be discerned. No other significant changes are discernible to the adjacent and surrounding properties from the 1924 aerial photograph.
1954 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1951 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1951 aerial photograph.
1961 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1954 aerial photograph. **Surrounding Properties:** A vacant lot and/or parking lot north of the Site appears to be developed with a structure. Some of the structures west of the Site on the same block are gone and the area appears to be used as storage for truck trailers or cargo containers. Two water tanks are located south of the Site. No other significant changes are discernible to the adjacent and surrounding properties from the 1954 aerial photograph.
1966 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1961 aerial photograph. **Surrounding Properties:** More the structures west of the Site on the same block are gone and the area appears to be used as storage for truck trailers or cargo containers. No other significant changes are discernible to the adjacent and surrounding properties from the 1961 aerial photograph.
1975 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1966 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1966 aerial photograph.
1984 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1975 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1975 aerial photograph.
1994 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1975 aerial photograph. The image is of poor quality. **Surrounding Properties:** The structures on the block south of the Site's block are gone and the area appears to be vacant. No other significant changes are discernible to the adjacent and surrounding properties from the 1975 aerial photograph. The image is of poor quality.
2006 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1994 aerial photograph. **Surrounding Properties:** A large building complex has been constructed on the block south of the Site's block. No other significant changes are discernible to the adjacent and surrounding properties from the 1994 aerial photograph.
2009 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2006 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2006 aerial photograph.
2011 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2009 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2009 aerial photograph.

The review of historical aerial photographs did not indicate RECs, CRECs, HRECs, or VECs at the Site or surrounding areas. Copies of reproducible historical aerial photographs are included in *Appendix G*.

5.4 Historical Fire Insurance Maps (Sanborn® Maps)

A search for historical fire insurance maps for the Site and adjoining properties was conducted by EDR. These maps were obtained for the following years: 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006. The following table presents descriptions and interpretations from historical fire insurance map review.

Year	Comments
1901	**Site:** The Site is depicted as vacant land. **Surrounding Properties:** Surrounding properties include residential dwellings, sheds, a hotel, a polling place, a **blacksmith,** and a **sign painting shop**. A large tract of vacant land is located immediately west of the Site.
1912	**Site:** No significant changes have occurred to the Site from the 1901 map. **Surrounding Properties:** Several more residential dwellings have been developed in the areas north, east, south, and west of the Site. The **sign painting shop** is no longer depicted to the north-northeast of the Site across Merrick Blvd. No other significant changes have occurred to the adjacent and surrounding properties from the 1901 map.
1926	**Site:** The Site is depicted with a commercial structure located at the corner of Merrick Blvd. and 107th Avenue. The remainder of the property appears as vacant land. No other significant changes have occurred to the Site from the 1912 map. **Surrounding Properties:** Several residential dwellings have been developed on the blocks northeast and west of the Site. An **auto painting facility** is located to the north-northeast of the Site across Merrick Blvd. and a **sign painting shop** is located to the north of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1912 map.
1951	**Site:** The vacant portion of the Site property is now developed. A structure covers the majority of the property. The structure is divided into three areas labeled 'wood working, **finishing**, and show room'. No other significant changes have occurred to the Site from the 1926 map. **Surrounding Properties:** Two **iron works**, two **auto repair facilities**, a **lacquer paint shop**, and two **gasoline filling stations** are located to the north of the Site on the same block. An **auto body repair shop** and a **gasoline filling station** are located to the east of the Site across Merrick Blvd. A **gasoline filling station**, **carpet cleaner**, and **auto repair and paint shop** are located to the south of the Site. The New York City Transit System Service Station and Garage is located to the west of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1926 map.
1981	**Site:** No significant changes have occurred to the Site from the 1951 map. **Surrounding Properties:** A structure north of the Site is now labeled '**auto parts mfg**'. A building labeled '**salvage depot**' is located to the north of the Site. A **print shop** and two **auto repair facilities** are located east of the Site. A **truck repair sh**op is located to the southeast of the Site. The two **gasoline filling stations** to the north of the Site and the **gasoline filling station** south of the Site are no longer depicted. The residential dwellings and other structures located at towards the southern end of the Site block (north of the Site) are gone and the area is labeled 'bus parking'. No other significant changes have occurred to the adjacent and surrounding properties from the 1951 map.
1982	**Site:** No significant changes have occurred to the Site from the 1981 map. **Surrounding Properties:** The **carpet cleaner** located to the south of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1981 map.
1986	**Site:** No significant changes have occurred to the Site from the 1982 map. **Surrounding Properties**: A **junk yard** is depicted to the east of the Site along 106th Avenue. No other significant changes have occurred to the adjacent and surrounding properties from the 1982 map.
1988-1993	**Site:** The structure on the property is labeled 'vacant' beginning in 1989. No other significant changes have occurred to the Site from the 1986 map. **Surrounding Properties**: The **junk yard** is no longer depicted beginning in 1991. An **auto repair facility** is depicted at the southeast corner of Merrick Blvd. and 104th Avenue beginning in 1993. No other significant changes have occurred to the adjacent and surrounding properties from the 1986 map.
1995	**Site:** No significant changes have occurred to the Site from the 1993 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1993 map.

Year	Comments
1996	**Site:** No significant changes have occurred to the Site from the 1995 map. **Surrounding Properties:** An **auto repair and wash facility** is depicted to the north of the Site on the same block. No significant changes have occurred to the adjacent and surrounding properties from the 1995 map.
1999	**Site:** No significant changes have occurred to the Site from the 1996 map. **Surrounding Properties:** The **gasoline filling station** located to the east of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1996 map.
2001-2006	**Site:** No significant changes have occurred to the Site from the 1999 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1999 map.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the Site:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The historic use of the Site as woodwork finishing facility is considered a REC/VEC.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the surrounding areas:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Several current auto repair facilities and one retail gasoline filling station were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

Copies of the historical fire insurance maps are provided in *Appendix H*.

5.5 City Directories

A review of historical city directories for the Site and surrounding areas was conducted by EDR. The following table presents descriptions and interpretations from the historical city directory reviews.

Year	Comments
1922	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1934	**Site:** The Site address was listed for **Monarch Motor Service & Supply Co.** **Surrounding Properties:** Surrounding properties included residential listings and a bakery.
1939	**Site:** The Site address was listed for **Monarch Motor Service & Supply Co.** **Surrounding Properties:** Surrounding properties included residential listings, a **junk yard**, **auto repairs**, an **auto painting shop**, a **gasoline filling station,** and the Dry Steam Appliance Co.

Year	Comments
1945	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, an auto parts store, a **home heating oil service**, and a **gasoline filling station**.
1950	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, offices, liquor store, a garage, a grocery, a tavern, a tool and die company, a **printing company**, an **iron works**, a **home heating oil service**, a **gasoline filling station**, and a nursing home.
1962	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and an electronics corporation.
1967	**Site:** The Site address was listed for Blank Ezra Associates. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and a **gasoline filling station**.
1970	**Site:** The Site address was listed for Blank Ezra Associates. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1976	**Site:** The Site address was listed for Blank Ezra Associates. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1983	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1991	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings**, auto body shops,** and Rocket Sewer Service.
1996	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
2000	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a **printing company**, **auto body shops**, and a daycare facility.
2005	**Site:** The Site address was listed for **Birds Auto Repair, Calvin Auto Body Repair Inc., Highways Custom Cycles, and Terminal Euro Tuning**. **Surrounding Properties:** Surrounding properties included residential listings, a **printing company**, **auto body shops**, an auto wrecking facility, a furniture store.
2008	**Site:** The Site address was listed for **Birds Auto Repair, Calvin Auto Body Repair Inc., Cedric Auto Body Inc., and Terminal Euro Tuning**. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and a storage facility.
2013	**Site:** The Site address was listed for **Birds Auto Repair and First World Auto Repair**. **Surrounding Properties:** Surrounding properties included residential listings, the **Hadco Metal Trading Co**., **auto body shops**, a medical office, a **printing company**, restaurants, and Caribbean Heating Corp.

The review of the historical city directories revealed the presence of the following RECs and VECs at the Site:

- The current and historic use of the Site as an auto repair facility is considered a REC/VEC.

The review of historical city directories revealed the presence of the following RECs and VECs at the surrounding areas:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

Copies of the historical city directories are provided in *Appendix J.*

5.6 Prior Reports

STV reviewed a *Phase I ESA for Eight Properties Near Jamaica Bus Depot*, dated February 17, 2012. The report was prepared by STV on behalf of MTA NYCT. The properties are located in the Borough of Queens, New York, including Lots 41, 53, 60, 61, 63, 66, 68, and 72 within Block 10164. The Phase I ESA identified RECs in connection with the properties addressed as 103-16 Merrick Boulevard and 103-30 Merrick Boulevard. These properties historically including an auto repair shop and filling stations with gasoline storage tanks. Additionally, an existing product plume at the Site and adjacent properties is considered a REC. Finally, based on open spills, undocumented tightness testing and known subsurface contamination, the Jamaica Bus Depot and BP Service Station #11009 represent RECs. The Phase I ESA revealed environmental concerns associated with the Site including suspect ACM, LBP on interior and exterior painted surfaces, suspect PCBs, and water staining and mold growth.

The report concluded that NYCT has performed extensive soil and groundwater investigations, including post-remediation sampling, at the Jamaica Bus Depot from approximately 2002 to the present. Based on the ongoing environmental monitoring being administered under NYSDEC Global Consent Order, active pump and treat remediation system, and numerous sub-surface environmental investigations that have been performed at the Jamaica Bus Depot, a Phase II Environmental Site Investigation (ESI) was not required. Based on the review of this existing information, recommendations were provided for engineering controls to be implemented during future site development. At a minimum, the following remedial actions and/or engineering controls are required to render the Site suitable for use:

1. Prior to any site redevelopment, a geophysical survey should be performed to determine if any underground storage tanks (USTs) are present at 103-16 Merrick Boulevard, 103-30 Merrick Boulevard and any other potential excavation locations. Additionally, in the event that a UST is discovered, an evaluation should be made at that time of the need for any additional investigation to determine whether soil and/or groundwater has been adversely impacted more than is currently documented.
2. As a safeguard to prevent potential volatile organic compounds in soil vapor from entering the new building in the future, a soil vapor barrier should be integrated into the new building design.
3. All material excavated during construction activities should be properly characterized and disposed, including collection and analysis of additional samples if required by the contractor-selected disposal facilities.
4. After the proposed new building and grounds are constructed, any exposed soil (landscaped areas) must be covered with at least two feet of environmentally clean fill.
5. Suspect ACM, LBP, PCB-containing materials and/or mold encountered during construction or excavation should be properly identified and managed.

5.7 Other Historical Sources

In 2012, STV was provided with several previous environmental reports pertaining to the area adjacent to the Site - the NYCT Jamaica Depot located at 165-18 South Road, Jamaica, Queens, NY. URS Corporation (URS) is currently providing environmental engineering services for the Jamaica Bus Depot

in conjunction with NYCT's UST program. The work is being administered under NYSDEC Global Consent Order CO2-20000101-3341 dated May 2001. NYCT has been operating a pump and treat remediation system to recover a combined heating oil and diesel fuel release since 1995 at the Jamaica Bus Depot. NYSDEC spill #9010039 was initially reported on December 14, 1990 and continues to be an open case, along with several other spills that occurred consequently. Numerous investigations have been performed at the Jamaica Bus Depot by URS to evaluate the extent of product in the sub-surface and all possible in-situ remedial measures to address petroleum-impacted soil and groundwater. These are as follows:

- Soil Investigation Report, October 2002. This investigation consisted of the advancement of five soil borings within the plume and collecting soil samples to determine the presence and vertical extent of petroleum-impacted soil beneath the water table. This study was prompted by NYCDEP's intention to re-activate the Jamaica Water Supply wells for regional dewatering in 2007 which could lower the water table by as much as 16 feet. The study concluded that product releases likely occurred when the water table was depressed during the previous operation of the Jamaica water supply system (pre-1996). However, soil impacts when compared with cleanup objectives were insignificant.
- Site-Specific Investigation Work Plan (SSIWP), May 2004. A soil and groundwater investigation was conducted in 2003 to determine the levels to which product had impacted soils relative to NYSDEC TAGM soil cleanup objectives, the results of which were reported in this SSIWP. Six borings were advanced with soil samples and groundwater samples were collected from nearby wells. The results imply that free product and the associated petroleum contaminants detected in soils were not significantly impacting dissolved-phase groundwater quality. The SSWIP also discussed the feasibility of bioremediation at the Jamaica Depot.
- Feasibility of Enhanced Product Recovery through Site-Wide Groundwater Depression, May 2004. This feasibility study (FS) was prompted by NYSDEC correspondence to URS dated April 29, 2004 that suggested that the product recovery system be enhanced or redesigned to increase product recovery through a significant increase in the pumping rate to overcome the rise in groundwater levels. The FS consists of dewatering calculations to determine the capacity of a remediation system capable of lowering the water table in the depot area by five feet. The pumping rate was estimated on the higher end of the range from 400 to 4,000 gpm, based on operating data from the existing system. The FS also stated that the product plume was currently trapped beneath the water table but was stable and not migrating.
- Site-Specific Remedial Plan (SSRP) for In-Situ Bioremediation Investigation, October 2004. In-situ enhanced bioremediation was recommended as the only feasible technology for soil remediation, considering the site constraints. Implementation would be done through the injection of a slurry of oxygen-releasing material in the subsurface. An investigation was performed in June 2004 to support this recommendation and thus acquire site-specific information pertaining to existing microbiologic conditions within and outside of the historic limits of the free product plume. Two borings were advanced (GP-7 and GP-8) near existing monitoring wells (W-10 and W-25) and samples were collected for both, respectively.
- Site-Specific Remedial Plan and Remedial Design (SSRP/RD) for Enhancing Product Recovery, March 2005. The SSRP/RD was designed to address the fact that effective in-situ technologies to treat trapped product are limited. At a meeting with NYSDEC and NYCT on February 25, 2005, one potential approach was identified utilizing the full capacity of a single extraction well for recovery in of product in that area. The SSRP/RD was approved in a letter dated May 5, 2005 by the NYSDEC for the use of one well (PW-4) to pump 170 gallons per minute (gpm) in order to lower the water table by four feet in an area extending 20-25 feet from the extraction point. If the design is successful, it will be utilized at a later date to address the rest of the plume.

- Remediation Analytical Data, 2008-2011. Groundwater quality is being monitored during remediation at the Jamaica Depot, as well as groundwater and product levels.

5.8 Historical Use Interviews

No other historical sources were available for interview.

6.0 REGULATORY AGENCY RECORD REVIEWS

The databases discussed in this section, provided by EDR, were reviewed for information regarding documented and/or suspected releases of regulated hazardous substances and/or petroleum products on or near the Site (*Appendix I*). STV also reviewed the "unmappable" (also referred to as "orphan") listings within the database report, cross-referencing available address information and facility names. Unmappable sites are listings that cannot be plotted with confidence, but are identified as being located within the general area of the Site based on the partial street address, city name, or zip code. In general, a listing cannot be mapped due to inaccurate or incomplete address information in the database that was supplied by the corresponding regulatory agency. Any listings from the unmappable summary which were identified by STV as a result of the area reconnaissance and/or cross-referencing to mapped listings are included in the corresponding database discussion within this section.

6.1 Federal and State Regulatory Agency Database Reviews

A review of federal and state records for the Site was accomplished by contacting offices of Federal and State regulatory agencies and review of the regulatory listings compiled in the regulatory agency database report (*Appendix I*). The results of the review of the Federal and State records are presented below. Copies of the correspondences are included in *Appendix K*.

United States Environmental Protection Agency (USEPA)
The USEPA is responsible for protecting human health and the environment. To that end, the USEPA develops and enforces regulations that implement environmental laws enacted by Congress. A Freedom of Information Law (FOIL) request dated October 1, 2015 was filed with the USEPA to determine if the agency holds additional records pertaining to the Site property. USEPA acknowledged the request on October 1, 2015. At the time this report was issued, STV had not yet received any further responses from USEPA. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

The status of the Site was also checked on USEPA's MyPropertyInfo website on September 30, 2015. A search of the databases did not locate any environmental records. A copy of the MyPropertyInfo result is included in *Appendix K*.

New York State Department of Environmental Conservation (NYSDEC)
The NYSDEC maintains files of incidents involving environmentally regulated materials, spill incidents, and state regulated cleanups. The records maintained by NYSDEC include reports of spills of hazardous chemicals and petroleum, petroleum bulk storage information, and site-specific environmental data. NYSDEC information concerning the Site property was requested in a FOIL records access application dated October 1, 2015. NYSDEC acknowledged the request on October 2, 2015. NYSDEC sent a response email dated October 13, 2015, indicating that no records have been located for the Site.

New York State Department of Health (NYSDOH)
The NYSDOH Records Access Office maintains files of health-related environmental incidents in the State of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYSDOH information concerning the Site property was requested in a formal letter dated September 30, 2015. NYSDOH acknowledged the request on September 30, 2015. NYSDOH sent a response letter dated October 23, 2015, indicating that no records have been located for the Site.

A summary of sites identified through the Federal and State regulatory agency database review is provided in the following table:

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
National Priorities List for Federal Superfund Cleanup (NPL)	03/26/2015	1 mile	0	No	No
Delisted NPL Site List	03/26/2015	1 mile	0	No	No
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), including CERCLIS NFRAP Sites	10/25/2013	½ mile	0/0	No	No
Resource Conservation and Recovery Information System – Corrective Action Activity (RCRIS CORRACTS) and Non-CORRACTS Treatment, Storage, or Disposal Facilities (RCRIS-TSD)	06/09/2015	1 mile / ½ mile	0/0	No	No
Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)	06/09/2015	¼ mile	2/1/2	No	**Yes**
RCRA Non-Generator	06/09/2015	¼ mile	11	**Yes**	**Yes**
Federal Institutional Control/Engineering Control Registries	06/09/2015	½ mile	0/0	No	No
Emergency Response Notification System (ERNS)	06/22/2015	Site	NA[1]	No	No
State Toxic Release Inventory System (TRIS)	12/31/2013	¼ mile	0	No	No
Hazardous Substance Waste Disposal Site Inventory (HSWDS)	01/01/2003	½ mile	0	No	No
New York State Inactive Hazardous Waste Disposal Sites (SHWS)	08/17/2015	1 mile	3	No	No
Solid Waste Management Facilities Sites (SWF/LF)	06/24/2015	½ mile	12	No	**Yes**
Vapor Reopened	11/01/2014	1 mile	1	No	No
New York State Spills Information (NY Spills)/Leaking Underground Storage Tanks (LTANKS)	08/17/2015	½ mile 1/8 mile	16/31	No	**Yes**
Petroleum Bulk Storage Tanks (USTs/ASTs)	07/29/2015	¼ mile	6/12	No	**Yes**
NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)	01/01/2002	¼ mile	0/1	No	**Yes**
NY Chemical Bulk Storage Tanks (NY CBS)	07/29/2015	¼ mile	2	No	**Yes**
Historic Bulk Storage Tanks (USTs/ASTs)	01/01/2002	¼ mile / Site	2/0	No	**Yes**
Air Emissions Data (US AIRS)	07/22/2015	Site	1	**Yes**	**Yes**
Facility Index / Registry System (FINDS)	01/18/2015	Site	1	**Yes**	No

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)	08/17/2015	1 mile	0/1	No	No
E-Designation Site (E)	05/27/2015	1/8 mile	40	**Yes**	**Yes**
Registered Dry Cleaners	07/02/2015	½ mile	0	No	No
EDR US Hist Auto Stat	NA	¼ mile	38	**Yes****	**Yes**
EDR US Hist Cleaners	NA	½ mile	1	No	**Yes**
NY Manifest	08/01/2015	¼ mile	18	**Yes**	**Yes**
NJ Manifest	12/31/2013	¼ mile	3	No	**Yes**
RI Manifest	12/31/2013	¼ mile	1	No	**Yes**
Manufactured Gas Plant Sites (Coal Gas)	NA[2]	1 mile	1	No	No

* The surrounding area search radius indicates the radial area (measured from the perimeter of the Site) for which the database review was performed.
** The Site address is listed in the search results but the Site is not identified as the target property.
[1]NA – Not Applicable
[2] This database consists of a compilation of historic resources (as early as the late 1800s) prepared by EDR that does not require updates. The last MGP in New York State ceased operations in 1972.

The Site is listed in the RCRA Non-Gen/NLR, US AIRS, FINDS, E-Designation, NY Manifest, and EDR US Hist Auto Stat databases. The following subsections provide a discussion of the listings that have been identified within the search radii and are in the table above:

National Priorities List of Federal Superfund Cleanup (NPL)
The NPL is a subset of the CERCLIS, and lists properties that are ranked as high priority for cleanup under the federal Superfund program. Neither the Site nor any other facility within one mile of the Site is listed in the NPL Site List.

Delisted NPL Site List
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the USEPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425 (e), sites where no further response is appropriate may be deleted from the NPL. Neither the Site nor any other facility within one mile of the Site is listed in the Delisted NPL Site List.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
The CERCLIS list is a compilation of known and suspected uncontrolled or abandoned hazardous waste sites which are, or were, under investigation by USEPA but have not been elevated to the status of a Superfund (NPL) site. Former CERCLIS sites that have been granted the status of No Further Remedial Action Planned (NFRAP) are also included in the database. Neither the Site nor any other facility within one-half mile of the Site is listed in the CERCLIS or CERCLIs NFRAP databases.

Resource Conservation and Recovery Information System (RCRIS) – Treatment, Storage, or Disposal Facilities (TSD) and RCRIS Corrective Action Activity (CORRACTS)
The RCRA program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRIS database tracks facilities that treat, store, and/or dispose of hazardous waste as defined by RCRA (referred to as TSD facilities). The RCRIS CORRACTS database identifies TSD facilities that have conducted, or are currently conducting, corrective action(s) as regulated under RCRA.

Neither the Site nor any other facility within one mile of the Site is listed in the RCRIS CORRACTS database and neither the Site nor any other facility within one-half mile of the Site is listed in the RCRIS-TSD database.

Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)
This list includes operations that generate or transport hazardous waste for which a hazardous waste generator identification number or transporter permit is required. The RCRIS Gen/Trans listing is merely a listing of all facilities that, due to the amount of hazardous waste generated, are required to register with the USEPA for tracking purposes, but are not necessarily those with reported contamination incidents. The Site was not listed in the RCRIS Gen/Trans database.

Two (2) RCRA Large Quantity Generators (RCRA-LQG) were listed within a one-quarter mile radius of the Site. Based on their distance from the Site and lack of reported violations, these RCRA-LQG listings are not anticipated to have affected the environmental integrity of the Site.

One (1) RCRA Small Quantity Generator (RCRA-SQG) was listed within a one-quarter mile radius of the Site. The following RCRA-SQG facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
R&S Parts & Service Inc. dba Strauss Auto 168-08 Liberty Avenue Jamaica, NY 11433	967-ft/North-northwest	Up-gradient	K111	EPA ID: NYD980758080. The Site is also listed on the NY Manifest database. Facility generates spent halogenated solvents.

Two (2) RCRA Conditionally Exempt Small Quantity Generators (RCRA-CESQG) were listed within a one-quarter mile radius of the Site. The following RCRA-CESQG facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCTA 165-18 South Road Jamaica, NY 11433	812-ft/Northwest	Cross-gradient	I99	EPA ID: NYD980642268. The Site is also listed on the US AIRS, NJ Manifest, and RI Manifest databases. Facility generates cadmium, lead, and waste oils and has listed violations associated with its operations.

Based on its distance from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow direction, the other RCRA-CESQG listing is not anticipated to have affected the environmental integrity of the Site.

Resource Conservation and Recovery Information System Non-Generators / No Longer Reporting (RCRA NonGen / NLR)

RCRAInfo is USEPA's comprehensive information system, providing access to data supporting the RCRA of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the RCRA. Non-Generators do not presently generate hazardous waste. The Site is listed in the RCRA NonGen / NLR database as follows:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	Target Property	NA	A2	EPA ID: NYD987030012. The Site is also listed on the NY Manifest database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.

Ten (10) other RCRA NonGen / NLR facilities were identified within a one-quarter mile radius of the Site. The following RCRA NonGen / NLR facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	21-ft/North-northeast	Cross-gradient	A6	EPA ID: NYD981874407. The Site is also listed on the NY Manifest database.
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	995-ft/Northwest	Up-gradient	L114	EPA ID: NYD986903763. The Site is also listed on the NY Manifest database. The facility is a retail gasoline filling station.

None of the other RCRA Non/Gen /NLR listings are anticipated to have affected the environmental integrity of the Site, based on their distances from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow directions.

Federal Institutional Control/Engineering Control Registries

The Federal Institutional Control/Engineering Control Registries are listings of sites with engineering controls and/or institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining at a site. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or affect human health. Neither the Site nor any other facility within one-half mile of the Site is listed in the Federal Institutional Control/Engineering Control Registries.

Emergency Response Notification System (ERNS)
The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances. The Site is not listed in the ERNS database.

New York State Toxic Release Inventory System (TRIS)
The Toxic Release Inventory System (TRIS) is a database used to collect information and report releases of toxic chemicals to the air, water, and land in reportable quantities. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the TRIS database.

Hazardous Substance Waste Disposal Site Inventory (HSWDS)
The list includes any known or suspected hazardous substance waste disposal sites. Also included are sites delisted from the Registry of Inactive Hazardous Waste Disposal Sites and non-Registry sites that USEPA Preliminary Assessment (PA) reports or Site Investigation (SI) reports were prepared. Hazardous Substance Waste Disposal Sites are eligible to be Superfund sites. The sites on the list will not automatically be made Superfund sites; rather each site will be further evaluated for listing on the Registry. Neither the Site nor any other facility within one-half mile of the Site is listed in the HSWDS database.

New York State Inactive Hazardous Waste Disposal Sites (SHWS)
The New York State Inactive Hazardous Waste Disposal Sites database, compiled by the NYSDEC, maintains information regarding the investigation and cleanup of suspected hazardous waste sites. The Site is not listed in the SHWS database.

Three (3) SHWS facilities were listed within a one-mile radius of the Site. Based on their distances from the Site (greater than one-half mile) and/or inferred down-gradient groundwater flow direction, these SHWS facilities are not anticipated to have affected the environmental integrity of the Site.

Solid Waste Management Facilities Sites (SWF/LF)
The SWF/LF database is a comprehensive listing of State permitted/recorded solid waste management facilities. The Site is not listed in the SWMF database.

Twelve (12) SWF/LF facilities were listed within a one-half mile radius of the Site. The following SWF/LF facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Taylor Auto Collision 104-21 Merrick Blvd. Jamaica, NY 11433	500-ft/North-northwest	Up-gradient	F62	The Site was engaged in vehicle dismantling. The Site is inactive.
Junk Yard International 169-09 Liberty Avenue Jamaica, NY 11433	1,102-ft/North	Up-gradient	M123	The Site was engaged in vehicle dismantling. The Site is inactive.
S&S Super Sports Auto Care Inc. 94-40 Merrick Blvd. Jamaica, NY 11433	1,265-ft/Northwest	Up-gradient	P142	The Site was engaged in vehicle dismantling. The Site is inactive.

Based on their distances from the Site and/or inferred down-gradient groundwater flow direction, the other SWF/LF facilities are not anticipated to have affected the environmental integrity of the Site.

Vapor Reopened

New York is currently re-evaluating previous assumptions and decisions regarding the potential for soil vapor intrusion exposures at sites. As a result, all past, current, and future contaminated sites will be evaluated to determine whether these sites have the potential for exposures related to soil vapor intrusion. The Site is not listed in the Vapor Reopened database.

One Vapor Reopened facility was listed within a one-mile radius of the Site. The facility is identified as West Side Corp., and is located 3,278-ft east-northeast of the Site at 107-10 180th Street. This facility is also listed in the NY UST and Historical UST databases. The site contains soil vapor and contaminated groundwater above guidance values. Based on its distance from the Site and/or inferred down-gradient groundwater flow direction, this Vapor Reopened listing is not anticipated to have affected the environmental integrity of the Site.

New York State Spills Information Database (NY Spills)/Leaking Underground Storage Tanks (LTANKS)

The NY Spills database, including LTANKS sites, was researched to identify listings within one-half mile of the Site. The database search identified 16 reported NY Spills and 31 LTANKS incidents within one-half mile of the Site. The Site is not listed in the NY Spills/LTANKs databases.

The following NY Spills / LTANKS facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	812-ft/Northwest	Cross-gradient	I101	Spill No. 9010039 was reported on 12/14/90. The spill was the result of a tank test failure. The spill is not closed. There are known petroleum-impacted soils and groundwater. NYCT has been operating a pump and treat system since 1995.

Based on distance from the Site combined with the assumed hydraulic relationship and/or the nature of the incident/regulatory status, none of the other facilities located within one-half mile of the Site identified in the NY Spills/LTANKS databases are expected to impact the environmental integrity of the Site.

Petroleum Bulk Storage Tanks (USTs/ASTs)

The NYSDEC PBS tank database was researched to identify listings for the Site and adjacent properties. The PBS Tank database is a listing of all facilities that are required to register their storage tanks for tracking purposes and not necessarily those with reported contamination incidents. The Site is not listed in the PBS tank database.

A total of 18 facilities (6 UST sites and 12 AST sites) were identified within one-quarter mile from the Site. The following UST facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BHELA 105-15 Merrick Blvd. Jamaica, NY 11433	206-ft/North-northwest	Up-gradient	A21	PBS No. 2-601509. The Site is an active retail gasoline filling station. The site has three (3) 4,000-gallon gasoline USTs and one (1) 4,000-gallon diesel UST. The Site is also listed on the NY AST database.
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	812-ft/Northwest	Cross-gradient	I100	PBS No. 2-190225. The site has five (5) 4,000-gallon diesel USTs and five (5) 4,000-gallon biodiesel UST. There are two (2) 15,000-gallon #6 fuel oil USTs and twelve (12) 2,000-gallon diesel USTs that are closed-in-place. There are two (2) 15,000-gallon #2 fuel oil USTs that are temporarily out-of-service. The site has a history of spills with one open spill case.
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	995-ft/Northwest	Up-gradient	L113	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-gallon #2 fuel oil UST that are all closed-in-place.

Based on distance from the Site, assumed hydraulic relationship, the lack of known releases with the potential to affect the Site, and/or current regulatory status, none of the other facilities identified within one-quarter mile of the Site in the PBS database are expected to impact the environmental integrity of the Site.

NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)

The NYSDEC chemical bulk storage (NY CBS UST/AST) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS UST/AST database lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons and/or in underground tanks of any size. The Site was not identified on the NY CBS UST/AST database.

One facility was listed within one-quarter mile of the Site. This NY CBS UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	812-ft/Northwest	Cross-gradient	I102	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS, and NY Spills databases.

NY Chemical Bulk Storage (NY CBS)
The NYSDEC chemical bulk storage (NY CBS) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons. The Site was not identified on the NY CBS database.

Two (2) facilities were listed within one-quarter mile of the Site. The following facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	812-ft/Northwest	Cross-gradient	I102	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Based on its distance from the Site, the other NY CBS listing is not anticipated to have affected the environmental integrity of the Site.

Historical Bulk Storage Tanks (USTs/ASTs)
These facilities have petroleum bulk storage capabilities in excess of 1,100 gallons and less than 400,000 gallons. This database contains detailed information per site. This database is no longer updated. More current data is presented in the PBS UST/AST databases. The Site is not listed in the HIST UST/AST databases.

The database identified the presence of two (2) historic UST facilities located within one-quarter mile of the Site. This HIST UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	995-ft/Northwest	Up-gradient	L113	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
				gallon #2 fuel oil UST that are all closed-in-place.

Based on its distance from the Site, the other HIST UST listing is not anticipated to have affected the environmental integrity of the Site.

Air Emissions Data (US AIRS)
The US AIRS database contains point source emissions inventory data. The Site was listed in the US AIRS database under Calvin Auto Body, located at 106-04A Merrick Boulevard. This US AIRS listing has the potential to impact the environmental integrity of the Site and is considered a REC/VEC.

Facility Index System / Facility Registry System (FINDS)
The Facility Index System / Facility Registry System (FINDS) contain both facility information and 'pointers' to other sources that contain more detail. The Site is listed in the FINDS database under Calvin Auto Body, located at 106-04A Merrick Boulevard. This FINDS listing is not anticipated to have affected the environmental integrity of the Site.

New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)
The Voluntary and Brownfield remedial programs involve mostly private entities and private funds to remediate contaminated sites and return the properties to productive use. The NYSDEC VCP/BCP database was researched to identify listings for the Site and within a one-mile radius of the Site. The Site is not listed in the VCP/BCP databases.

One (1) BCP facility is listed within one mile of the Site. Based on its distance from the Site and/or inferred down-gradient groundwater flow direction, this BCP listing is not anticipated to have affected the environmental integrity of the Site.

E-Designation Site Listing (E-Designation)
The E (Environmental) Designation would ensure that sampling and remediation take place on the subject properties, and would avoid any significant impacts related to hazardous materials at these locations. The E-designations require that the owner of the sites conduct testing and sampling following set protocols, to the satisfaction of city agencies. In addition, the owner must remediate when appropriate. The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing for the Site for hazardous materials is considered to be a REC/VEC.

The database identified thirty-nine (39) other E-Designation listings within a one-eighth-mile radius of the Site. The listings are associated with E-designation reference No. E-39 (Underground Gasoline Storage Tanks Testing Protocol) and E-175 (Underground Gasoline Storage Tanks Testing Protocol). The listed sites are all considered as RECs/VECs with respect to the Site.

Registered Dry Cleaners
The NYSDEC registered dry cleaners database was researched to identify listings within one-quarter mile of the Site. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the dry cleaners database.

EDR Exclusive Historic Auto Stations (EDR US Hist Auto Stat)

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is listed in the EDR US Hist Auto Stat database under the 106-04 Merrick Boulevard address but this listing is not identified as the target property in the EDR search results. This listing is considered an onsite REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
106-04 Merrick Blvd. Jamaica, NY 11433	Target Property	NA	A3	Identified as Birds Auto Repair. Listed for years 1999-2012.

The database search identified 37 other listings within one-quarter mile of the Site. The EDR Hist Auto Stat facilities that are considered RECs/VECs with respect to the Site are as follows:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
106-03 Merrick Blvd. Jamaica, NY 11433	72 feet/ North-northeast	Down-gradient	A9	Identified as Truck Repair Services. Listed for years 2011 and 2012.
105-17 Merrick Blvd. Jamaica, NY 11433	214 feet/ North-northwest	Cross-gradient	A26	Identified as Fred's Auto Repair. Listed for year 2002.
105-15 Merrick Blvd. Jamaica, NY 11433	218 feet/ North-northwest	Cross-gradient	A29	Identified as Citgo Gas Station and Henrys Repair Shop. Listed for years 1999-2001.
105-02 Merrick Blvd. Jamaica, NY 11433	224 feet/ North-northwest	Cross-gradient	D30	Identified as Garvey's Auto Repair and Ralke Auto Repairs. Listed for years 1999, 2000, 2011, and 2012.
105-09 Merrick Blvd. Jamaica, NY 11433	229 feet/ North-northwest	Cross-gradient	A33	Identified as Inter City Tire Corp. Listed for year 2006.
107-17 Merrick Blvd. Jamaica, NY 11433	255 feet/ Southeast	Down-gradient	C41	Identified as E&D Auto Seat Cover, Dave's Precision Auto Service Inc., Inspection City Auto Repair Inc., and Haldane Auto Service. Listed for years 1999-2008 and 2010-2012.
107-35 Merrick Blvd. Jamaica, NY 11433	372 feet/ Southeast	Down-gradient	C46	Identified as Mystique Auto Body Works Corp. Listed for years 1999-2002, 2004, 2005, and 2009.
104-28 Merrick Blvd. Jamaica, NY 11433	486 feet/ North-northwest	Cross-gradient	F55	Identified as AAA Transmissions & Engines. Listed for years 2004, 2005, and 2009.

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
107-55 Merrick Blvd. Jamaica, NY 11433	503 feet/ Southeast	Down-gradient	H63	Identified as General Auto Body Works Listed for years 1999, 2000, 2002-2005, 2009-2012.
104-21 Merrick Blvd. Jamaica, NY 11433	503 feet/ North-northwest	Up-gradient	F64	Identified as Taylor Auto Collision Inc. Listed for years 1999-2002, 2004-2009, and 2011.
104-19 Merrick Blvd. Jamaica, NY 11433	509 feet/ North-northwest	Up-gradient	F66	Identified as Full Line Auto Repairs. Listed for years 1999-2001, 2003-2007, and 2009-2012.
107-57 Merrick Blvd. Jamaica, NY 11433	518 feet/ Southeast	Down-gradient	H70	Identified as Birds Auto Repair Listed for years 2003 and 2005-2012.
104-15 Merrick Blvd. Jamaica, NY 11433	523 feet/ North-northwest	Up-gradient	F72	Identified as Dynamic Autoworks Inc., Ace Auto Body & Truck Repair, Jimmy's Trans & Auto Repair, and Sports Line Auto Repair. Listed for years 1999-2005, 2008, 2010, and 2012.
104-13 Merrick Blvd. Jamaica, NY 11433	529 feet/ North-northwest	Up-gradient	F77	Identified as Full Line Auto Repairs. Listed for year 2002.
104-09 Merrick Blvd. Jamaica, NY 11433	542 feet/ North-northwest	Up-gradient	F80	Identified as Junior Auto Collision, RJS Car Care Center Inc., L&C Auto Collision, NASCAR Auto Body Inc., and Integrity Collision & Towing. Listed for years 2001-2012.
107-61 Merrick Blvd. Jamaica, NY 11433	550 feet/ Southeast	Down-gradient	H83	Identified as D&G Foreign Auto Repair. Listed for years 2010-2012.
107-65 Merrick Blvd. Jamaica, NY 11433	582 feet/ Southeast	Down-gradient	H88	Identified as H&S Auto Trans & Repair, New Queens Village Auto Service, and Queens Village Auto Radiator. Listed for years 2001, 2005, and 2010-2012.

Due to their distances from the Site and/or the presumed groundwater flow direction none of the other EDR Hist Auto Stat facilities are considered RECs/VECs with respect to the Site.

EDR Exclusive Historic Dry Cleaners (EDR US Hist Cleaners)

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is not listed in the EDR US Hist Cleaners database.

The database search identified one (1) listing within one-half mile of the Site. This facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
107-37 166th Street Jamaica, NY 11433	498 feet/ South	Down-gradient	E61	Identified as ABD Cleaners Corp. Listed for year 2009.

NY Manifest

The NY Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is listed in the EDR US Hist Auto Stat database and this listing is considered a REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	Target Property	NA	A2	EPA ID: NYD987030012. The Site is also listed on the RCRA NonGen / NLR database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.

Sixteen (16) other NY Manifest facilities were identified within one-quarter mile of the Site. The following NY Manifest facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	21-ft/North-northeast	Cross-gradient	A6	EPA ID: NYD981874407. The Site is also listed on the RCRA NonGen / NLR database.
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	995-ft/Northwest	Up-gradient	L114	EPA ID: NYD986903763. The Site is also listed on the RCRA NonGen / NLR database. The facility is a retail gasoline filling station.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NY Manifest facilities are expected to impact the environmental integrity of the Site.

NJ Manifest

The NJ Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the NJ Manifest database.

Three (3) NJ Manifest facilities were identified within one-quarter mile of the Site. The following NJ Manifest facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCT 165-18 South Road Jamaica, NY 11433	812- ft/Northwest	Cross-gradient	I99	The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NJ Manifest facilities are expected to impact the environmental integrity of the Site.

RI Manifest

The RI Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the RI Manifest database.

One (1) RI Manifest facility was identified within one-quarter mile of the Site. The following RI Manifest facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCT 165-18 South Road Jamaica, NY 11433	812- ft/Northwest	Cross-gradient	I99	The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Manufactured Gas Plant Sites (Coal Gas)

Manufactured gas sites were used in the United States from the 1800's to the 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water and produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils, and other compounds are potentially hazardous to human health and the environment. The byproducts were frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination. The Manufactured Gas Plant (MGP) Sites database was researched to identify any listings for the Site and within a one-mile radius of the Site. The Site is not listed in the MGP database.

One (1) facility within one mile of the Site is listed in the MGP database. The facility is identified as Jamaica Gas and Light and is located approximately 3,232-ft west of the Site at Beaver Road and 158th Street. Due to its distance from the Site and/or the presumed groundwater flow direction this facility is not considered a REC/VEC with respect to the Site.

Orphan Listings

A review of the Orphan Listings in the database search report indicated a total of four (4) listings. The Orphan sites are not considered RECs based on their estimated distances from the Site (none adjacent or on the Site block) and/or the nature of the activity/release.

6.2 Local Regulatory Agency Research

A review of local records for the Site was accomplished by contacting offices of New York City regulatory agencies including the NYCDOB, NYCDEP, Department of Health and Mental Hygiene (NYCDOHMH), NYCDCP, and the Fire Department (FDNY). The results of the review of local records are presented below. Copies of the correspondences are included in *Appendix K*.

New York City Department of Buildings (NYCDOB)
NYCDOB records were reviewed on November 13, 2015 to determine whether there are references to buildings, tanks or other structures, property use or inspection reports that indicate the presence, past use, or release of hazardous substances, wastes, or petroleum products at the Site. The NYCDOB records review indicated that the Site has five (5) NYCDOB violations. These violations are for construction violations for working without a permit. There were no RECs identified as a result of review of NYCDOB records. Copies of the NYCDOB records are included in *Appendix J*.

New York City Department of Environmental Protection (NYCDEP)
The NYCDEP maintains files of incidents involving environmentally regulated materials. The records maintained by NYCDEP include reports of spills of hazardous chemicals and citizen's complaints on environmental issues. NYCDEP information concerning the Site was requested in a formal application for records dated October 1, 2015. At the time this report was issued, STV had not yet received a response from NYCDEP. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of Health and Mental Hygiene (NYCDOHMH)
The NYCDOHMH, Bureau of Environmental Investigations (BEI) maintains files of health-related environmental incidents in the City of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYCDOHMH information concerning the Site was requested in a formal FOIL request form dated October 1, 2015. NYCDOHMH acknowledged the request on October 6, 2015. At the time this report was issued, STV had not yet received any response from NYCDOHMH. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of City Planning (NYCDCP)
STV reviewed the NYCDCP Zoning Map 14d, available via the NYCDCP on-line web-site. According to the map, the Site is currently located within zone “M1-1”, which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

“E” designations for blocks or lots on city zoning maps were issued since approximately March 2003 and indicate that potential environmental issues are associated with these parcels. The environmental issues may or may not be associated with potential contamination by hazardous or petroleum substances. Parcels with “E” designations require that the fee owner of the site conduct a testing and sampling protocol, and remediation where appropriate, to the satisfaction of the New York City Office of Environmental Remediation (NYCOER) before the issuance of a building permit by the NYCDOB pursuant to the provisions of Section 11-15 of the Zoning Resolution (Environmental Requirements).

The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing for the Site for hazardous materials is considered to be a REC/VEC.

New York City Fire Department (FDNY)

The FDNY maintains information concerning petroleum USTs. STV submitted a Fuel Oil Record Search Request Form to the FDNY on October 1, 2015 for information concerning the Site. At the time this report was issued, STV had not yet received a response from FDNY. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

7.0 USER RESPONSIBILITIES

7.1 Environmental Liens or Activity and Use Limitations

An Environmental Lien Search Report was obtained from EDR for the Site. The Environmental Lien Search Report provides results from a search of available and current land title records for environmental liens and other activity and use limitations, such as engineering controls and institutional controls. A review of the report indicates that no environmental liens or other activity and use limitations were found for the Site. A copy of the environmental lien search report is included in *Appendix J*.

7.2 Valuation Reduction for Environmental Issues

No information was available at the time of the assessment regarding the relationship of the purchase price of the property to the fair market value of the property. If information is received regarding valuation reduction for environmental issues which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.3 Knowledge or Experience of the User

No person with specialized knowledge or experience that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.4 Commonly Known or Reasonably Ascertainable Information

No person within the local community with commonly known or reasonably ascertainable information about the property that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.5 The Degree of Obviousness of the Presence or Likely Presence of Contamination at the Property

NYCT is not currently aware of any obvious indicators that point to the presence or likely presence of new or imminent releases at the property. Additionally, NYCT is not currently aware of any obvious indicators important to the screening of VECs in connection with the property.

8.0 SITE RECONNAISSANCE AND INTERVIEWS

8.1 Methodology and Limiting Conditions

The inspection of the Site included observations of the property and surrounding area (Site reconnaissance) that were made to identify potential sources or indications of hazardous substances, including: ASTs; USTs; tank vents and fill ports; transformers and other items that could contain PCBs; waste storage areas; hazardous materials usage, storage, and disposal; stained surfaces and soils; stressed vegetation; leaks; and, odors. In addition, readily-observable portions of the properties immediately adjacent to the Site were viewed from public rights-of-way to identify or determine the likelihood of any of the aforementioned potential sources of contamination being present. There were no limiting conditions with respect to impact on the accuracy of the Site reconnaissance.

8.2 Site Reconnaissance

Mr. Doane Cafferty of STV performed the Site visit on November 12, 2015. A request for access to the Site was communicated in a letter dated October 27, 2015 that was mailed to Mr. Fred Bauerschmidt (the property owner). At the time this visit was conducted, STV had not yet received a response from Mr. Bauerschmidt. Consequently, the site inspection was conducted from the public sidewalk in front of the Site. At the time of the inspection, the weather was approximately 50º F with sunny skies. The weather did not prevent STV from conducting a thorough inspection of the Site and surrounding areas. *Appendix C* provides representative photographs of the Site.

Block 10164, Lot 90 is an approximately 9,406 square-foot (sf) property that contains a one-story building constructed in 1931. The building has two units. The northern unit is currently occupied by First World Auto Repair and the southern unit is currently occupied by Calvin Auto Body.

The Site is bound to the north by a mixed-use residential/commercial building followed by bus depot parking lots, a one-story commercial office building, a parking lot, custom wheel, tire, and rim supply and repair shop and several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south by 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street.

8.3 Current and Historical Use Interviews

The following knowledgeable persons were interviewed with regard to the Site pursuant to ASTM 1527-13 Section 10:

8.3.1 Current Property Owner

The subject property is currently owned by 'Bauerschmidt Realty Holding Corp.'. Based on the research, this entity has owned the Site since at least 1994. All prior ownership information reviewed is presented in *Appendix J*. The review of current and historical ownership and tax records information did not reveal evidence of RECs or VECs associated with prior use of the Site.

8.3.2 Current Site Operator or Key Site Manager

Name	Title/Company	Years Associated with Site
Mr. Fred Bauerschmidt	Owner	Approx. 21

Detailed information provided during the above-listed interview is documented on Record of Communication forms in *Appendix K*.

8.3.3 Site Occupants

Other than the Owner's representative, Site occupants were not available to interview during this assessment.

8.3.4 Past Owners, Operators and Occupants

Past owners or occupants of the Site were not available to interview during this assessment. STV was unable to obtain contact information from any previous owners or occupants.

8.3.5 Report User

Name	Title/Company	Years Associated with Site
Mr. Emil Dul	NYCT Real Estate Department	<1

According to the ASTM E 1527-13 User Questionnaire provided by Mr. Emil Dul of NYCT's Real Estate Department, NYCT is not aware of any environmental liens, land use limitations, specialized knowledge, or past uses of the Site. Detailed information provided during the above-listed interviews is referenced in applicable sections of this report and a copy of the completed ASTM E1527-13 User Questionnaire is included in *Appendix K*.

8.4 Hazardous Substances and Petroleum Products Storage and Handling

8.4.1 Hazardous Substances

No hazardous substances were stored or located on the Site within view from the sidewalk areas. There was no visual or olfactory evidence of leakage or staining anywhere on the Site that was visible from the sidewalk areas. STV concludes that storage and handling of hazardous substances do not presently represent a REC or VEC for the Site.

8.4.2 Petroleum Products Storage and Handling

No evidence of petroleum product storage was observed at the Site within view from the sidewalk areas. STV concludes that storage and handling of petroleum products do not presently represent a REC or VEC for the Site.

8.5 Solid Waste Generation, Storage and Disposal

No containers for solid waste were observed on the Site. Solid waste generation, storage, and disposal are not considered a REC or a VEC with respect to the Site.

8.6 Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are toxic components of various products including, but not limited to caulking materials, light ballasts, and dielectric and hydraulic fluids that were formerly used in electrical equipment such as transformers and hydraulic elevators/lifts. The manufacture and use of PCBs was banned in the United States in 1978.

STV did not observe any electrical transformers on or adjacent to the Site. Potential buried structures, historic fill, fluorescent lighting fixtures, and window caulking on the property could include PCB-containing materials and is considered an environmental concern with respect to the Site.

8.7 Asbestos-Containing Material (ACM)

STV conducted a limited visual survey (i.e., within accessible areas only) for the presence of suspect ACM within the Site. The intent of the survey was to identify exposed suspect ACM through preliminary non-destructive observations. No sampling of suspect ACM was performed during this investigation. Pursuant to applicable asbestos control regulations and guidelines, STV considered any observed suspect materials to be asbestos-containing.

Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect ACM.

8.8 Lead-Based Paint (LBP) Survey

During the Site inspection, a limited visual assessment of all accessible painted surfaces was performed. No sampling or intrusive work was performed as this is outside the scope of work of this assessment. All painted surfaces are assumed to be LBP.

Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.

8.9 Regulatory Compliance

STV does not consider regulatory compliance to be an environmental concern for the Site.

8.10 Electromagnetic Fields

A visual inspection was performed for the presence of high voltage power lines and or substations located in close proximity to the Site. No such power lines or substations were identified; therefore, STV does not consider electromagnetic fields to be an environmental concern at the Site.

8.11 Other Environmental Concerns (Methane, Mold, etc.)

Based on a review of the historic topographic map and knowledge of the area, the Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site.

As part of this assessment, STV conducted a limited assessment for the presence of water damage and odors, indicative of the potential for mold growth, on accessible surfaces within the Site. There was no evidence of water damage or mold noted during the Site inspection.

9.0 SUMMARY OF FINDINGS

The Site is located at 106-04 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 90). Block 10164, Lot 90 is an approximately 9,406 square-foot (sf) property that contains a one-story building constructed in 1931. The building has two units. The northern unit is currently occupied by First World Auto Repair and the southern unit is currently occupied by Calvin Auto Body.

The Site is bound to the north by a mixed-use residential/commercial building followed by bus depot parking lots, a one-story commercial office building, a parking lot, custom wheel, tire, and rim supply and repair shop and several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by Merrick Boulevard followed by a parking lot, various auto repair facilities, and a retail gasoline station; to the south by 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street.

NYCDCP Zoning Map 14d indicated the Site is designated as zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol).

The Site is generally flat and the topography of the surrounding area slopes to the south-southeast. According to the USGS 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, and information contained in the regulatory agency database report, the Site elevation is approximately 28 feet amsl.

The nearest surface water body is a pond in Captain Tilly Park, located approximately 5,045 feet north-northwest of the Site. Based on topography, the groundwater flow in the area of the Site is assumed to be south-southwest towards Jamaica Bay. The depth to groundwater is estimated to range from approximately 20-25 feet bgs.

The Phase I ESA identified on-Site RECs pertaining to potential buried structures from former buildings that could contain underground storage tanks and/or historic fill materials of unknown origin; the current historic use of the Site as an auto repair facility; the historic use of the Site as a woodworking finishing facility; and the Site's listing with an E-Designation for underground storage tanks testing protocol.

Off-site RECs include three solid waste management facilities; a nearby facility with an open spill; one facility that currently generates spent halogenated solvents; one facility that historically generated cadmium, lead, and waste oils; an active gas station; several historical and current auto repair facilities; one historic dry cleaner; several nearby properties with E-Designation listings for underground storage tanks testing protocol; and the historical presence of a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs in close proximity to the Site. The Phase I ESA revealed environmental concerns associated with suspect ACM, LBP, PCB-containing materials.

10.0 CONCLUSIONS AND RECOMMENDATIONS

STV has performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527-13 and the requirements of NYCT. Any additions to, exceptions to, or deletions from this practice are described in Section 2.0 of this report.

The Phase I ESA has revealed the following RECs, CRECs, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The current and historical use of the Site as an auto repair facility is considered a REC/VEC.

- The historical use of the Site as a woodworking finishing facility is considered a REC/VEC.

- The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that generates spent halogenated solvents is located in close proximity to the Site and is considered a REC/VEC.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- A facility with an open spill is located northwest of the Site at 165-18 South Road. This property is considered a REC/VEC based on its proximity to the Site and hydraulically cross-gradient position with respect to the Site.

- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect ACM.
- Based on the age of the Site building (circa 1931), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.
- Potential buried structures, historic fill, fluorescent lighting fixtures, and window caulking may contain PCBs.

Recommendations

STV recommends that any ACM, LBP, and/or PCB-containing materials affected by future renovations, repairs or demolition at the Site be identified and properly managed during such activities. If the NYCT considers purchasing the property in the future, or if future development requires soil disturbance, a comprehensive Phase II Environmental Site Investigation should be conducted.

11.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

STV Incorporated (STV) has performed a Phase I ESA of the property located at 106-04 Merrick Boulevard, Jamaica, Queens, New York 11433 (Block 10164, Lot 90). The scope of the Phase I ESA was consistent with the requirements of ASTM Standard Practice E 1527-13 and of NYCT. Signatures of the Environmental Professionals who participated in conducting this Phase I ESA are provided below. Qualifications for these individuals are provided in *Appendix L*. STV declares that to the best of their professional knowledge and belief, they meet(s) the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. STV has the specific qualifications based on education, training and experience to assess the subject property. STV has developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Prepared By:
Doane E. Cafferty, LEED AP BD+C
Senior Environmental Scientist

Reviewed By:
Christine Vilardi, P.G., LEED Green Associate
Quality Control Officer

Reviewed By:
Peter S. Helseth, P.E.
Senior Project Manager

12.0 REFERENCES

Persons Interviewed:

- Mr. Fred Bauerschmidt, Owner, 106-04 Merrick Blvd., Jamaica, Queens, New York, DATE TBD.

Resources Consulted:

- EDR – Radius Map™ Report with GeoCheck®, September 29, 2015.
- EDR – Historical Sanborn® Maps: 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006.
- EDR – Aerial Photographs: 1924, 1951, 1954, 1961, 1966, 1975, 1984, 1994, 2006, 2009, and 2011.
- EDR – USGS Historical Topographic Maps: 1900, 1924, 1947, 1957, 1966, 1979, and 1994.
- EDR – City Directories: 1922, 1934, 1939, 1945, 1950, 1962, 1967, 1970, 1976, 1983, 1991, 1996, 2000, 2005, 2008, and 2013.
- EDR - Environmental Lien Search dated September 30, 2015.
- NYC Department of Finance – Assessment Roll: 2006-2015.
- Oasis Website - www.oasisnyc.net/OASISMap.htm.
- FEMA Map Services Center Website - www.msc.fema.gov
- National Wetlands Inventory Website - www.fws.gov/nwi/
- USGS New York Water Science Center http://ny.ims.er.usgs.gov/li-dtw/ and http://ny.ims.er.usgs.gov/LI_maps06

Regulatory Agencies Contacted:

- New York City Department of Buildings, October 1, 2015.
- New York City Fire Department, October 1, 2015.
- New York City Planning and Zoning Department, October 1, 2015.
- New York City Department of Environmental Protection, October 1, 2015.
- New York City Department of Health and Mental Hygiene, October 1, 2015.
- New York State Environmental Conservation, October 1, 2015.
- New York State Department of Health, October 1, 2015.
- Unites States Environmental Protection Agency, October 1, 2015.

Documents and Maps:

- ASTM International (ASTM) 2013, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," ASTM Designation E 1527-13.
- ASTM E 2600-10 "Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions."
- STV Potential Property Acquisition Eight Properties Near Jamaica Bus Depot, Jamaica, New York, dated February 17, 2012
- U.S. Geological Survey, Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, Charles Baskerville, 1994. USGS I 2306.
- U.S. Geological Survey, Groundwater in Bronx, New York and Richmond Counties with Summary Data on Kings and Queens Counties, New York City, New York, Nathaniel Perlmutter and Theodore Arnow, 1953. USGS 6W-32.

- Water Supply Paper 2498 (USGS 1999) Ground-Water Resources of Kings and Queens Counties, Long Island, New York by Herbert Buxton and Peter Schernoff.
- USGS LI Depth-to Water Tool for Long Island (USGS, 2013).

13.0 APPENDICES

Appendix A - Site Location Map
Appendix B - Site Plan
Appendix C - Site Photographs
Appendix D - National Wetlands Inventory Map
Appendix E - FEMA Flood Insurance Rate Map
Appendix F - Historical Topographic Maps
Appendix G - Historical Aerial Photographs
Appendix H - Historical Sanborn Fire Insurance Maps
Appendix I - Regulatory Agency Database Report
Appendix J - Supporting Documents
Appendix K - Records of Communication & Agency Correspondence
Appendix L - Qualifications of Environmental Professionals

Phase I ESA - 166-15 107th Ave

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PHASE I ENVIRONMENTAL SITE ASSESSMENT
OF

166-15 107TH AVENUE
BLOCK 10164, LOT 95
JAMAICA, QUEENS, NEW YORK 11433

CONTRACT NO.: CM-1411/D-61162
TASK ORDER NO.: 24
CONSULTANT PROJECT NO.: 30-17749-0001

AUGUST 24, 2016

Prepared by:

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1.0 EXECUTIVE SUMMARY

At the request of New York City Transit (NYCT), STV Incorporated (STV) conducted a Phase I Environmental Site Assessment (ESA) of the property located at 166-15 107th Avenue, Jamaica, Queens, New York 11433 (hereafter referred to as the "Site"). The legal description of the Site is Block 10164, Lot 95. NYCT is evaluating the feasibility of acquiring the Site for the Jamaica Bus Depot reconstruction.

Block 10164, Lot 95 is an approximately 2,600 square-foot (sf) property that is used for parking for vehicles that are being serviced at the business located on the adjoining property (Calvin Auto Body at 106-04 Merrick Blvd.). The Site is owned by "Bauerschmidt Realty Holding Corp." according to the Environmental Data Resources (EDR) Environmental Lien Search. Historically, the Site was occupied a residential dwelling and a church. The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

The main objective of the Phase I ESA is to identify *recognized environmental conditions (RECs)* and environmental concerns that may affect the suitability of the Site for acquisition and redevelopment. RECs are defined in ASTM International (ASTM) Standard Practice E 1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property. Note that *controlled recognized environmental conditions (CRECs)* are considered to be RECs and are listed in the Executive Summary and Conclusions of this Phase I ESA. Additionally, *vapor encroachment conditions (VECs)* were evaluated as per ASTM E 2600-10.

Other environmental issues and conditions that, in the opinion of the *environmental professional* conducting the assessment, would not be considered *RECs* are identified in this assessment. These may include *historical RECs* and/or *de minimis* conditions. The Phase I ESA also includes a preliminary evaluation of specific potential environmental issues or conditions that are, according to ASTM E 1527-13, considered non-scope considerations. These issues include radon, asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing light ballasts and caulking materials, exterior lead-based paint (LBP), chemical storage, wetlands, regulatory compliance issues, dry cleaner and other industrial emissions, mold, biological agents, electromagnetic fields, and methane. The Phase I ESA included a review of Federal, State, and local records, previous reports and historical documents; visual observation of the Site and adjoining properties; and, interviews with selected Site representatives.

The assessment requested by NYCT is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included evaluation of the following: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-site solid waste management and disposal practices; on-site hazardous materials and petroleum products management; chemical storage, ACM, PCBs and exterior LBP management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions; radon; mold and moisture intrusion; biological agents; electromagnetic fields; and, potential for methane generating materials.

Summary of RECs, CRECs, VECs and Environmental Concerns

This Phase I ESA has revealed the following RECs, CRECS, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The Site property was previously developed with a low-rise structure. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that generates spent halogenated solvents is located in close proximity to the Site and is considered a REC/VEC.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- A facility with an open spill is located northwest of the Site at 165-18 South Road. This property is considered a REC/VEC based on its proximity to the Site and hydraulically cross-gradient position with respect to the Site.

- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Potential buried structures and historic fill on the property could include ACM, LBP and/or PCB-containing materials.

STV recommends performing a Phase II Environmental Site Investigation, consisting of a geophysical survey and the collection and analysis of soil and groundwater samples to determine whether the identified RECs have impacted the value of the Site or the development and use of the Site.

2.0 INTRODUCTION

This report summarizes the results of the Phase I Environmental Site Assessment (ESA) of the property located at 166-15 107th Avenue, Jamaica, Queens, New York 11433 (Block 10164, Lot 95) (hereafter referred to as the "Site"). Block 10164, Lot 95 is an approximately 2,600 square-foot (sf) property that is used for parking for vehicles that are being serviced at the business located on the adjoining property (Calvin Auto Body at 106-04 Merrick Blvd.). NYCT is evaluating the feasibility of acquiring the Site for the Jamaica Bus Depot reconstruction.

The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

Mr. Doane Cafferty of STV performed the Site visit on November 12, 2015. A request for access to the Site was communicated in a letter dated October 27, 2015 that was mailed to Mr. Fred Bauerschmidt (the property owner). At the time this visit was conducted, STV had not yet received a response from Mr. Bauerschmidt. Consequently, the site inspection was conducted from the public sidewalk in front of the Site. The weather was approximately 50º F with sunny skies; there were no limitations caused by the weather.

2.1 Selected Definitions

The following terms are used throughout this report and, for the purpose of clarity, corresponding definitions are provided. These terms are fully defined in ASTM E 1527-13 and ASTM E 2600-10.

Controlled Recognized Environmental Condition (CREC) – A recognized environmental condition resulting from a past *release* of *hazardous substances* or *petroleum products* that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority) with *hazardous substances* or *petroleum products* allowed to remain in place subject to the implementation of required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Historical Recognized Environmental Condition (HREC) – A past *release* of any *hazardous substances* or *petroleum products* that occurred in connection with the *property* and has been addressed to the satisfaction of the applicable regulatory authority, without subjecting the *property* to any required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Recognized Environmental Condition (REC) – The presence or likely presence of any *hazardous substances* or *petroleum products* in, on, or at a *property:* (1) due to any *release* to the *environment*; (2) under conditions indicative of a *release* to the *environment*; or, (3) under conditions that pose a *material threat* of a future *release* to the *environment*.

Environmental Professional - A person meeting the education, training, and experience requirements as set forth in 40 CFR § 312.10(b), necessary to conduct a *site reconnaissanc*e, *interview*s, and other activities in accordance with this practice, and from the information generated by such activities, having the ability to develop opinions and conclusions regarding conditions indicative of releases or threatened

releases on, at, in, or to a property, sufficient to meet the objectives and performance factors in 40 CFR § 312.20(e) and (f).

Vapor Encroachment Condition (VEC) - The presence or likely presence of chemical of concern vapors in the subsurface of the target property caused by the release of vapors from contaminated soil or groundwater or both either on or near the target property.

2.2 Purpose and Scope

The purpose of this assessment is to identify RECs, CRECs, VECs, and certain other environmental issues or concerns as they existed at the Site at the time of the Site visit. The assessment is intended to identify conditions that would have the potential to impact the value of the Site or the development and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser, or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included, but was not limited to an assessment of the following potential environmental issues: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-Site solid waste management and disposal practices; on-Site hazardous materials and petroleum products management; asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing equipment and lead-based paint (LBP) management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions, radon, mold and moisture intrusion; biological agents; electromagnetic fields; and the potential for methane generating materials.

This evaluation was conducted by qualified *environmental professionals* utilizing a standard of good commercial and customary practice in accordance with ASTM E 1527-13. The scope of work completed for this evaluation meets all requirements of ASTM E 1527-13 and includes the following:

- Documenting the physical characteristics of the Site through a review of available topographic, geologic, wetland, flood plain, groundwater data and Site observations.

- Researching the Site history through a review of reasonably ascertainable standard sources such as land deeds, fire insurance maps, city directories, aerial photographs, prior reports and interviews.

- Documenting current Site conditions, via observations and interviews, regarding the presence or absence of hazardous substances/petroleum products; the generation, treatment, storage, or disposal of hazardous, regulated, or medical wastes; the presence of electrical equipment that utilizes oils which potentially contain PCBs; and, the presence of storage tanks (above and below ground), floor drains, drains that discharge to subsurface, former septic tanks and drywells.

- Determining the usage of adjoining and nearby properties to identify the likelihood for environmental conditions (if present and/or suspected) and concerns to migrate onto the Site.

- Evaluating information contained within Federal and State environmental databases and other local environmental records, within specific search distances.

2.3 Additions, Deviations, Deletions, Data Failures, and Data Gaps

The following environmental issues that are outside the scope of (additions to) ASTM E 1527-13 were evaluated:

- A review of available radon data for the Site vicinity.
- A review of available wetlands data.
- A visual assessment for water damage and mold.
- A visual assessment for suspect ACM.
- A visual assessment for suspect LBP.
- An assessment of potential methane generation on-Site or migration to the Site.
- Regulatory compliance.
- PCB light ballasts and caulking materials.
- Biological agents (mold, pigeon guano, medical wastes, etc.).
- Air emissions from drycleaners and other industrial sources.
- An assessment of the potential presence of electromagnetic fields (EMF).
- An assessment of any dust generating activities on or near the Site.

The following deviations, data gaps and deletions from ASTM E 1527-13 were necessary in conducting this assessment:

- The Site area history was not conducted in five-year intervals. However, sufficient information about the history of the Site and surrounding area could be obtained from the available historical fire insurance maps, aerial photographs, city directories, and local records and this data gap is not likely to alter the conclusions of this report.
- The Site reconnaissance was conducted from the sidewalk area in front of the Site because access was not granted by the owner or a representative of the owner at the time of the inspection.

2.4 Limitations and Exceptions

STV has prepared this Phase I ESA using reasonable efforts in each phase of its work to identify RECs associated with hazardous substances, wastes and petroleum products at the Site. The methodology of the Phase I ESA was consistent with the ASTM E 1527-13. Findings within this report are based on information collected from observations made on the day of the Site investigation and from reasonably ascertainable information obtained from governing public agencies and private sources.

This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation, or other construction purposes. STV makes no representation or warranty that the past or current operations at the Site are or have been in compliance with all applicable Federal, State and local laws, regulations and codes.

Regardless of the findings stated in this report, STV is not responsible for consequences or conditions arising from facts that were concealed, withheld, or not fully disclosed at the time the evaluation was conducted.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The regulatory database report provided is based on an evaluation of the data collected and compiled by a contracted data research company. The report focuses on the Site and neighboring properties that could impact the Site. Neighboring properties listed in governmental environmental records are identified within specific search distances. The search distance varies depending upon the particular government

record being checked. The regulatory research is designed to meet the requirements of ASTM E 1527-13. The information provided in the regulatory database report is assumed to be correct and complete.

3.0 SITE DESCRIPTION

3.1 Site Location and Legal Description

The Site is located at 166-15 107th Avenue, Jamaica, Queens, New York 11433 (Block 10164, Lot 95). Block 10164, Lot 95 is an approximately 2,600 square-foot (sf) property that is used for parking for vehicles that are being serviced at the business located on the adjoining property (Calvin Auto Body at 106-04 Merrick Blvd.).

The Site is located in the Jamaica neighborhood of Queens. The Site is "E" designated according to the New York City Department of City Planning (NYCDCP) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). A map showing the location of the Site is presented in *Appendix A*. A Site Plan showing the Site's physical layout including adjacent land use is presented in *Appendix B*. Photographs of the Site and surrounding areas are included in *Appendix C*.

The Site is bound to the north by a mixed-use residential/commercial building followed by bus depot parking lots, a one-story commercial office building, a parking lot, custom wheel, tire, and rim supply and repair shop and several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by an auto collision repair shop followed by Merrick Boulevard and subsequently a parking lot, various auto repair facilities, and a retail gasoline station; to the south by 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street. No changes to the Site were observed since the most recent Sanborn Map (2006).

The surrounding area is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR.

According to information obtained through the New York City Department of City Planning (NYCDCP) website, the Site is currently located within zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

3.2 Physical Setting

3.2.1 Topography

According to the United States Geological Survey (USGS) 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, the elevation of the Site is approximately 28 feet above mean sea level (amsl). The topography of the immediate Site area was observed to be sloping to the south-southeast. A copy of the topographic map is presented in *Appendix A*.

3.2.2 Geology

The geology of Queens County can be characterized as a wedge-shaped layer of Cretaceous and Pleistocene unconsolidated sediments, thickening to the south-southeast. Several impermeable clay layers are found within this sediment package, generally creating three distinct aquifers. Consolidated crystalline bedrock is of Precambrian age. The thickness of the unconsolidated sequence ranges from zero to approximately 1,300 feet below ground surface (bgs) from north to south. The southernmost portions of

Queens, including portions of the Rockaways, consist of glaciofluvial sediments derived from melt-water of the retreating glaciers. Depth to bedrock within the vicinity of the Site is at least 600 feet bgs (as per "Ground-Water Resources of Kings and Queens Counties, Long Island, New York, by Herbert Buxton and Peter Schernoff, dated 1999).

3.2.3 Soils

According to the GeoCheck Section of the regulatory agency database report (*Appendix I*), the soil in the area of the Site is described as Urban Land. Urban Land refers to soils that have been altered by human activities thus making them unidentifiable. Typically, these soils have been mixed with other materials, such as brick and concrete (urban fill), and characteristics can only be determined by on-site investigation. Other surficial soil types in the area of the Site consist of silt loam, loamy sand, sandy loam, and fine sandy loam. Sandy loam refers to a soil that's made of sand, silt, and clay.

3.2.4 Hydrology

Generally, groundwater contour lines mimic the surface topography and groundwater flow direction is perpendicular to these contour lines flowing from higher to lower elevation. According to USGS digital elevation data provided by Environmental Data Resources, Inc. (EDR) of Milford, Connecticut (*Appendix I*) and the USGS 7.5-minute Quadrangle map, *Jamaica, NY*, 2013, groundwater in the vicinity of the Site is inferred to flow to the south-southwest towards Jamaica Bay. According to "Water Table Altitude in Kings and Queens Counties, New York in March 1997" (USGS, 1997) depth to groundwater is anticipated to range from approximately 20 to 25 feet bgs. Estimated groundwater levels and/or flow direction(s) may vary due to seasonal fluctuations in precipitation, local usage demands, geology, underground structures, or dewatering operations. The groundwater in the vicinity of the Site is not known to be used for human consumption, as most potable water in the area is derived from upstate reservoirs managed by New York City; the Site area is serviced by the City water supply.

STV did not observe any retention ponds or other surface water bodies on the Site. The nearest surface water body is a pond in Captain Tilly Park, located approximately 5,045 feet north-northwest of the Site. Another pond, Baisley Pond, is located approximately 1.35 miles south of the Site. Bergen Basin, an inlet off Jamaica Bay, is located approximately 3.0 miles south-southwest of the Site.

STV reviewed the United States Fish and Wildlife Service National Wetlands Inventory (NWI) map for the area of the Site (http://www.fws.gov/wetlands/data/index.html) to determine if the Site is located in a regulated wetlands area. Based on a review of the map, the Site is not located within a regulated wetlands area. A copy of the wetlands map is included in *Appendix D*.

The Federal Emergency Management Agency (FEMA) Region II Coastal Analysis and Mapping Preliminary Flood Maps & Data website (http://www.region2coastal.com/view-flood-maps-data/view-preliminary-flood-map-data/) was reviewed to assess whether the Site is located within a designated flood plain or flood zone. According to the revised preliminary FIRM Panel 3604970233G (effective date January 30, 2015), the Site is not located within a 100-year flood zone; therefore, this does not represent an environmental concern for the Site. A copy of the flood insurance map for the Site area is included in *Appendix E*.

Stormwater is collected from catch basins located on paved areas of the Site and the surrounding streets and is conveyed into the NYCDEP combined storm/sanitary sewer system.

3.2.5 Radon

Radon is a colorless, odorless radioactive gas that results from the natural breakdown of uranium minerals in soil, rock, and water, which subsequently enters the atmosphere. It can concentrate in buildings, entering through cracks and other penetrations of a building foundation. Some areas are more likely to have elevated concentrations of radon than others, reflecting subsurface lithologic conditions.

The New York State Department of Health (NYSDOH) maintains a database of radon test results on a local and county level. According to the NYSDOH, 527 radon tests have been conducted in basements in Queens County. The average radon level was found to be 1.20 picoCuries per liter (pCi/L). According to Federal Area Radon Information presented in the EDR report (*Appendix I*), radon concentrations were tested at 81 locations in Queens County. The average radon concentration in Queens County, New York was 0.620 pCi/L in living areas tested and 0.970 pCi/L in basements tested. In addition, Queens County is in United States Environmental Protection Agency (USEPA) Radon Zone 3, where the indoor average radon level is less than 2 pCi/L. These results are below the USEPA Action Level of 4.0 pCi/L; therefore, STV concludes that it is unlikely that elevated levels of radon gas are present at the Site.

4.0 ADJOINING AND SURROUNDING PROPERTIES

The area surrounding the Site is primarily characterized low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the Jamaica Bus Depot, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR. The following table summarizes the adjoining site uses:

Direction	Facility Name/Description	Street Address/Location	Current Use
North	Res/Commercial, Commercial Office, Parking, Industrial/ Manufacturing	105-22 Merrick Blvd. 105-14 Merrick Blvd. 105-12 Merrick Blvd 105-02 Merrick Blvd. 104-32 Merrick Blvd. 104-28 Merrick Blvd. 104-22 Merrick Blvd. 104-12 Merrick Blvd. 104-10 Merrick Blvd. 104-02 Merrick Blvd.	Deli (closed) and Residences Parking Lot Parking Lot Domino's Pizza/Appliance Repair Parking Lot RVM Wheels Vacant Manufacturing Facility Vacant Manufacturing Facility Vacant Manufacturing Facility Vacant Manufacturing Facility
East	Transportation/Utility followed by Merrick Blvd. followed by Transportation/Utility and Parking and Retail Gasoline Sales	106-04 Merrick Blvd. Merrick Blvd. 104-15 Merrick Blvd. 104-19 Merrick Blvd. 105-09 Merrick Blvd. 105-15 Merrick Blvd.	First World Auto/Calvin Auto Body Public Street Sports Line Auto Repairs Auto repair facility (parking) Inter City Tire (truck tire center) BP Gas Station
South	107th Avenue	107th Avenue	Public Street
West	Transportation/Utility	165-18 South Road	Jamaica Bus Depot

Based on our inspection of the adjacent and surrounding properties, the following off-site RECs/VECs were identified:

- Several auto repair facilities are located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- One (1) active gasoline filling station is located in the area surrounding the Site. This property is considered a REC/VEC based on its proximity to the Site.

5.0 HISTORICAL USE RESEARCH

5.1 Land Title Records and Tax Records

STV researched prior ownership information for the Site at the New York City Department of Finance (DOF) website. In addition, prior ownership information was researched through EDR's Environmental Lien Search and the New York City Department of Buildings (NYCDOB) Automated City Register Information System (ACRIS) on-line website. The subject property is currently owned by "Bauerschmidt Realty Holding Corp". Based on the research, this entity has owned the Site since at least 1994. No environmental liens were identified for the Site. All prior ownership information reviewed is presented in *Appendix J*.

5.2 Historical USGS Topographic Quadrangles

STV reviewed available historical USGS Topographic Quadrangles for information regarding past uses of the Site and surrounding area. Topographic maps for the Brooklyn quadrangle were obtained for the following years: 1900 and 1924. Topographic maps for the Jamaica quadrangle were obtained for the following years: 1947, 1957, 1966, 1979, and 1994. The following table presents descriptions and interpretations from historical USGS topographic map review.

Year (Scale and Quadrangle)	Comments
1900 (1:62,500) Brooklyn	**Site:** The Site appears to be located amongst developed streets. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** Surrounding properties appear to be located amongst developed streets. The Long Island Railroad (LIRR) tracks are depicted to the north of the Site. A pond is depicted west-southwest of the Site on the south side of the LIRR tracks. The area a few blocks south of the Site appears as undeveloped land with only a few roadways present, rail lines, and a pond and wetlands area. Due to scale of the map, no further information can be obtained.
1924 (1:62,500) Brooklyn	**Site:** No significant changes are apparent to the Site property from the 1900 topographic map. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** No significant changes are apparent to the Site property from the 1900 topographic map. Due to scale of the map, no further information can be obtained.
1947 (1:25,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1924 topographic map. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** The areas north, east, south, and west of the Site have been significantly developed with streets and structures. A long building is depicted northwest of the Site on the same block. Prospect Cemetery is identified west of the Site on the south side of the LIRR tracks where a pond was previously depicted. The Jamaica Station is located west-northwest of the Site. Water Supply Company Tank No. 2 is located east of the Site. Baisleys Pond is depicted several blocks south of the Site. The Contagious Disease Hospital and Queens General Hospital are located northwest of the Site on the south side of Union Turnpike.
1957 (1:24,000) Jamaica	**Site:** Elevation contour lines are depicted on the map and show the Site is approximately 30 feet amsl. No other significant changes are apparent to the Site property from the 1947 topographic map. **Surrounding Properties:** An Armory is identified several blocks north of the Site on the north side of the LIRR tracks. Water pumping stations are located east and south of the Site. A water tower is depicted west of Site in the immediate vicinity of Prospect Cemetery. The LIRR Hillside Support Facility is depicted to the east of the Site. St. Albans Naval Hospital is located southeast of the Site. No other significant changes are apparent to the surrounding properties from the 1947 topographic map.

Year (Scale and Quadrangle)	Comments
1966 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1957 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1957 topographic map.
1979 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1966 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1966 topographic map except the water tower that was west of Site near Prospect Cemetery is no longer depicted.
1994 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1979 topographic map. **Surrounding Properties:** No significant changes are apparent to the surrounding properties from the 1979 topographic map.

Based on STV's review of historical topographic maps, the Site appears to be amongst developed streets as early as 1900. No evidence of filling was noted on the Site property. The Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site. The review of historical USGS Topographic Quadrangles did not indicate RECs, CRECs, HRECs, or VECs at the Site or surrounding areas. Copies of historical USGS Topographic Maps are included in *Appendix F*.

5.3 Historical Aerial Photographs

STV reviewed historical aerial photographs of the Site and surrounding areas provided by EDR in order to identify historical land use that may have involved hazardous substances and petroleum products. Aerial photographs were obtained for the following years: 1924, 1951, 1954, 1961, 1966, 1975, 1984, 1994, 2006, 2009, and 2011. The following table summarizes descriptions and interpretations from the historical aerial photograph reviews:

Year	Comments
1924 1" – 500'	**Site:** The Site appears to be developed with a structure. Due to the scale of the photograph, no further details can be discerned. **Surrounding Properties:** The areas adjacent to the Site to the east and south appear to be developed with multiple structures. The area north of the Site appears to be developed with a structure. A long building is visible northwest of the Site on the same block. Railroad tracks are depicted to the north. Due to scale of the photograph, no further details can be discerned.
1951 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1924 aerial photograph. **Surrounding Properties:** The areas adjacent to the Site to the east and south appear to be developed with multiple structures. The area north of the Site appears to be developed with a structure. A long building is visible directly northwest of the Site on the same block. Railroad tracks are depicted to the north. A large water tank is located south of the Site. Due to scale of the photograph, no further details can be discerned. No other significant changes are discernible to the adjacent and surrounding properties from the 1924 aerial photograph.
1954 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1951 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1951 aerial photograph.

Year	Comments
1961 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1954 aerial photograph. **Surrounding Properties:** A vacant lot and/or parking lot north of the Site appears to be developed with a structure. Some of the structures west of the Site on the same block are gone and the area appears to be used as storage for truck trailers or cargo containers. Two water tanks are located south of the Site. No other significant changes are discernible to the adjacent and surrounding properties from the 1954 aerial photograph.
1966 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1961 aerial photograph. **Surrounding Properties:** More the structures west of the Site on the same block are gone and the area appears to be used as storage for truck trailers or cargo containers. No other significant changes are discernible to the adjacent and surrounding properties from the 1961 aerial photograph.
1975 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1966 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1966 aerial photograph.
1984 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1975 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1975 aerial photograph.
1994 1" – 500'	**Site:** The building appears to be gone. No other significant changes are discernible on the Site from the 1975 aerial photograph. The image is of poor quality. **Surrounding Properties:** The structures on the block south of the Site's block are gone and the area appears to be vacant. No other significant changes are discernible to the adjacent and surrounding properties from the 1975 aerial photograph. The image is of poor quality.
2006 1" – 500'	**Site:** The Site appears as vacant land. No other significant changes are discernible on the Site from the 1994 aerial photograph. **Surrounding Properties:** A large building complex has been constructed on the block south of the Site's block. No other significant changes are discernible to the adjacent and surrounding properties from the 1994 aerial photograph.
2009 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2006 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2006 aerial photograph.
2011 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2009 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2009 aerial photograph.

The review of historical aerial photographs did not indicate RECs, CRECs, HRECs, or VECs at the Site or surrounding areas. Copies of reproducible historical aerial photographs are included in *Appendix G*.

5.4 Historical Fire Insurance Maps (Sanborn® Maps)

A search for historical fire insurance maps for the Site and adjoining properties was conducted by EDR. These maps were obtained for the following years: 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006. The following table presents descriptions and interpretations from historical fire insurance map review.

Year	Comments
1901	**Site:** The Site is depicted as vacant land. **Surrounding Properties:** Surrounding properties include residential dwellings, sheds, a hotel, a polling place, a **blacksmith,** and a **sign painting shop**. A large tract of vacant land is located immediately west of the Site.

Year	Comments
1912	**Site:** The Site is depicted with a residential dwelling. No other significant changes have occurred to the Site from the 1901 map. **Surrounding Properties:** Several more residential dwellings have been developed in the areas north, east, south, and west of the Site. The **sign painting shop** is no longer depicted to the north-northeast of the Site across Merrick Blvd. No other significant changes have occurred to the adjacent and surrounding properties from the 1901 map.
1926	**Site:** The residential dwelling is gone and Site is depicted with a church. No other significant changes have occurred to the Site from the 1912 map. **Surrounding Properties:** Several residential dwellings have been developed on the blocks northeast and west of the Site. An **auto painting facility** is located to the north-northeast of the Site across Merrick Blvd. and a **sign painting shop** is located to the north of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1912 map.
1951	**Site:** No significant changes have occurred to the Site from the 1926 map. **Surrounding Properties:** Two **iron works**, two **auto repair facilities**, **two paint shop**, and two **gasoline filling stations** are located to the north of the Site on the same block. An **auto body repair shop** and a **gasoline filling station** are located to the east of the Site across Merrick Blvd. A **gasoline filling station**, **carpet cleaner**, and **auto repair and paint shop** are located to the south of the Site. The New York City Transit System Service Station and Garage is located to the west of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1926 map.
1981	**Site:** The church is now identified as a residential dwelling. No other significant changes have occurred to the Site from the 1951 map. **Surrounding Properties:** The structure immediately north of the Site is now labeled '**auto parts mfg**'. A building labeled '**salvage depot**' is located to the north of the Site. A **print shop** and two **auto repair facilities** are located east of the Site. A **truck repair sh**op is located to the southeast of the Site. The two **gasoline filling stations** to the north of the Site and the **gasoline filling station** south of the Site are no longer depicted. The residential dwellings and other structures located at the southern end of the Site block are gone and the area is labeled 'bus parking'. No other significant changes have occurred to the adjacent and surrounding properties from the 1951 map.
1982	**Site:** No significant changes have occurred to the Site from the 1981 map. **Surrounding Properties:** The **carpet cleaner** located to the south of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1981 map.
1986	**Site:** No significant changes have occurred to the Site from the 1982 map. **Surrounding Properties**: A **junk yard** is depicted to the east of the Site along 106th Avenue. No other significant changes have occurred to the adjacent and surrounding properties from the 1982 map.
1988-1993	**Site:** The residential dwelling is gone (1988) and the Site appears as vacant land. No other significant changes have occurred to the Site from the 1986 map. **Surrounding Properties**: The **junk yard** is no longer depicted beginning in 1991. An **auto repair facility** is depicted at the southeast corner of Merrick Blvd. and 104th Avenue beginning in 1993. No other significant changes have occurred to the adjacent and surrounding properties from the 1986 map.
1995	**Site:** No significant changes have occurred to the Site from the 1993 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1993 map.
1996	**Site:** No significant changes have occurred to the Site from the 1995 map. **Surrounding Properties:** An **auto repair and wash facility** is depicted to the north of the Site on the same block. No significant changes have occurred to the adjacent and surrounding properties from the 1995 map.

Year	Comments
1999	**Site:** The commercial structure fronting Merrick Blvd. and two of the sheds on the Site are gone. One shed is depicted on the western property boundary. No other significant changes have occurred to the Site from the 1996 map. **Surrounding Properties:** The **gasoline filling station** located to the east of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1996 map.
2001-2006	**Site:** No significant changes have occurred to the Site from the 1999 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1999 map.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the Site:

- The Site property was previously developed with a low-rise structure. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the surrounding areas:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Several current auto repair facilities and one retail gasoline filling station were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

Copies of the historical fire insurance maps are provided in *Appendix H*.

5.5 City Directories

A review of historical city directories for the Site and surrounding areas was conducted by EDR. The following table presents descriptions and interpretations from the historical city directory reviews.

Year	Comments
1922	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1934	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings and a bakery.
1939	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a **junk yard**, **auto repairs**, an **auto painting shop**, a **gasoline filling station,** and the Dry Steam Appliance Co.
1945	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, an auto parts store, a **home heating oil service**, and a **gasoline filling station**.
1950	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, offices, liquor store, a garage, a grocery, a tavern, a tool and die company, a **printing company**, an **iron works**, a **home**

Year	Comments
	heating oil service, a **gasoline filling station**, and a nursing home.
1962	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and an electronics corporation.
1967	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and a **gasoline filling station**.
1970	**Site:** The Site address was listed with a residential listing. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1976	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1983	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings and **auto body shops**.
1991	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings**, auto body shops,** and Rocket Sewer Service.
1996	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
2000	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a **printing company**, **auto body shops**, and a daycare facility.
2005	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a **printing company**, **auto body shops**, an auto wrecking facility, a furniture store.
2008	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, **auto body shops**, and a storage facility.
2013	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, the **Hadco Metal Trading Co**., **auto body shops**, a medical office, a **printing company**, restaurants, and Caribbean Heating Corp.

The review of the historical city directories did not revealed the presence of RECs/VECs at the Site.

The review of historical city directories revealed the presence of the following RECs and VECs at the surrounding areas:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

Copies of the historical city directories are provided in *Appendix J.*

5.6 Prior Reports

STV reviewed a *Phase I ESA for Eight Properties Near Jamaica Bus Depot*, dated February 17, 2012. The report was prepared by STV on behalf of MTA NYCT. The properties are located in the Borough of Queens, New York, including Lots 41, 53, 60, 61, 63, 66, 68, and 72 within Block 10164. The Phase I ESA identified RECs in connection with the properties addressed as 103-16 Merrick Boulevard and 103-30 Merrick Boulevard. These properties historically including an auto repair shop and filling stations with gasoline storage tanks. Additionally, an existing product plume at the Site and adjacent properties is considered a REC. Finally, based on open spills, undocumented tightness testing and known subsurface contamination, the Jamaica Bus Depot and BP Service Station #11009 represent RECs. The Phase I ESA revealed environmental concerns associated with the Site including suspect ACM, LBP on interior and exterior painted surfaces, suspect PCBs, and water staining and mold growth.

The report concluded that NYCT has performed extensive soil and groundwater investigations, including post-remediation sampling, at the Jamaica Bus Depot from approximately 2002 to the present. Based on the ongoing environmental monitoring being administered under NYSDEC Global Consent Order, active pump and treat remediation system, and numerous sub-surface environmental investigations that have been performed at the Jamaica Bus Depot, a Phase II Environmental Site Investigation (ESI) was not required. Based on the review of this existing information, recommendations were provided for engineering controls to be implemented during future site development. At a minimum, the following remedial actions and/or engineering controls are required to render the Site suitable for use:

1. Prior to any site redevelopment, a geophysical survey should be performed to determine if any underground storage tanks (USTs) are present at 103-16 Merrick Boulevard, 103-30 Merrick Boulevard and any other potential excavation locations. Additionally, in the event that a UST is discovered, an evaluation should be made at that time of the need for any additional investigation to determine whether soil and/or groundwater has been adversely impacted more than is currently documented.
2. As a safeguard to prevent potential volatile organic compounds in soil vapor from entering the new building in the future, a soil vapor barrier should be integrated into the new building design.
3. All material excavated during construction activities should be properly characterized and disposed, including collection and analysis of additional samples if required by the contractor-selected disposal facilities.
4. After the proposed new building and grounds are constructed, any exposed soil (landscaped areas) must be covered with at least two feet of environmentally clean fill.
5. Suspect ACM, LBP, PCB-containing materials and/or mold encountered during construction or excavation should be properly identified and managed.

5.7 Other Historical Sources

In 2012, STV was provided with several previous environmental reports pertaining to the area adjacent to the Site - the NYCT Jamaica Depot located at 165-18 South Road, Jamaica, Queens, NY. URS Corporation (URS) is currently providing environmental engineering services for the Jamaica Bus Depot in conjunction with NYCT's UST program. The work is being administered under NYSDEC Global Consent Order CO2-20000101-3341 dated May 2001. NYCT has been operating a pump and treat remediation system to recover a combined heating oil and diesel fuel release since 1995 at the Jamaica Bus Depot. NYSDEC spill #9010039 was initially reported on December 14, 1990 and continues to be an open case, along with several other spills that occurred consequently. Numerous investigations have been performed at the Jamaica Bus Depot by URS to evaluate the extent of product in the sub-surface and

all possible in-situ remedial measures to address petroleum-impacted soil and groundwater. These are as follows:

- Soil Investigation Report, October 2002. This investigation consisted of the advancement of five soil borings within the plume and collecting soil samples to determine the presence and vertical extent of petroleum-impacted soil beneath the water table. This study was prompted by NYCDEP's intention to re-activate the Jamaica Water Supply wells for regional dewatering in 2007 which could lower the water table by as much as 16 feet. The study concluded that product releases likely occurred when the water table was depressed during the previous operation of the Jamaica water supply system (pre-1996). However, soil impacts when compared with cleanup objectives were insignificant.
- Site-Specific Investigation Work Plan (SSIWP), May 2004. A soil and groundwater investigation was conducted in 2003 to determine the levels to which product had impacted soils relative to NYSDEC TAGM soil cleanup objectives, the results of which were reported in this SSIWP. Six borings were advanced with soil samples and groundwater samples were collected from nearby wells. The results imply that free product and the associated petroleum contaminants detected in soils were not significantly impacting dissolved-phase groundwater quality. The SSWIP also discussed the feasibility of bioremediation at the Jamaica Depot.
- Feasibility of Enhanced Product Recovery through Site-Wide Groundwater Depression, May 2004. This feasibility study (FS) was prompted by NYSDEC correspondence to URS dated April 29, 2004 that suggested that the product recovery system be enhanced or redesigned to increase product recovery through a significant increase in the pumping rate to overcome the rise in groundwater levels. The FS consists of dewatering calculations to determine the capacity of a remediation system capable of lowering the water table in the depot area by five feet. The pumping rate was estimated on the higher end of the range from 400 to 4,000 gpm, based on operating data from the existing system. The FS also stated that the product plume was currently trapped beneath the water table but was stable and not migrating.
- Site-Specific Remedial Plan (SSRP) for In-Situ Bioremediation Investigation, October 2004. In-situ enhanced bioremediation was recommended as the only feasible technology for soil remediation, considering the site constraints. Implementation would be done through the injection of a slurry of oxygen-releasing material in the subsurface. An investigation was performed in June 2004 to support this recommendation and thus acquire site-specific information pertaining to existing microbiologic conditions within and outside of the historic limits of the free product plume. Two borings were advanced (GP-7 and GP-8) near existing monitoring wells (W-10 and W-25) and samples were collected for both, respectively.
- Site-Specific Remedial Plan and Remedial Design (SSRP/RD) for Enhancing Product Recovery, March 2005. The SSRP/RD was designed to address the fact that effective in-situ technologies to treat trapped product are limited. At a meeting with NYSDEC and NYCT on February 25, 2005, one potential approach was identified utilizing the full capacity of a single extraction well for recovery in of product in that area. The SSRP/RD was approved in a letter dated May 5, 2005 by the NYSDEC for the use of one well (PW-4) to pump 170 gallons per minute (gpm) in order to lower the water table by four feet in an area extending 20-25 feet from the extraction point. If the design is successful, it will be utilized at a later date to address the rest of the plume.
- Remediation Analytical Data, 2008-2011. Groundwater quality is being monitored during remediation at the Jamaica Depot, as well as groundwater and product levels.

5.8 Historical Use Interviews

No other historical sources were available for interview.

6.0 REGULATORY AGENCY RECORD REVIEWS

The databases discussed in this section, provided by EDR, were reviewed for information regarding documented and/or suspected releases of regulated hazardous substances and/or petroleum products on or near the Site (*Appendix I*). STV also reviewed the "unmappable" (also referred to as "orphan") listings within the database report, cross-referencing available address information and facility names. Unmappable sites are listings that cannot be plotted with confidence, but are identified as being located within the general area of the Site based on the partial street address, city name, or zip code. In general, a listing cannot be mapped due to inaccurate or incomplete address information in the database that was supplied by the corresponding regulatory agency. Any listings from the unmappable summary which were identified by STV as a result of the area reconnaissance and/or cross-referencing to mapped listings are included in the corresponding database discussion within this section.

6.1 Federal and State Regulatory Agency Database Reviews

A review of federal and state records for the Site was accomplished by contacting offices of Federal and State regulatory agencies and review of the regulatory listings compiled in the regulatory agency database report (*Appendix I*). The results of the review of the Federal and State records are presented below. Copies of the correspondences are included in *Appendix K*.

United States Environmental Protection Agency (USEPA)
The USEPA is responsible for protecting human health and the environment. To that end, the USEPA develops and enforces regulations that implement environmental laws enacted by Congress. A Freedom of Information Law (FOIL) request dated October 1, 2015 was filed with the USEPA to determine if the agency holds additional records pertaining to the Site property. USEPA acknowledged the request on October 1, 2015. At the time this report was issued, STV had not yet received any further responses from USEPA. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

The status of the Site was also checked on USEPA's MyPropertyInfo website on September 30, 2015. A search of the databases did not locate any environmental records. A copy of the MyPropertyInfo result is included in *Appendix K*.

New York State Department of Environmental Conservation (NYSDEC)
The NYSDEC maintains files of incidents involving environmentally regulated materials, spill incidents, and state regulated cleanups. The records maintained by NYSDEC include reports of spills of hazardous chemicals and petroleum, petroleum bulk storage information, and site-specific environmental data. NYSDEC information concerning the Site property was requested in a FOIL records access application dated October 1, 2015. NYSDEC acknowledged the request on October 2, 2015. NYSDEC sent a response email dated October 13, 2015, indicating that no records have been located for the Site.

New York State Department of Health (NYSDOH)
The NYSDOH Records Access Office maintains files of health-related environmental incidents in the State of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYSDOH information concerning the Site property was requested in a formal letter dated September 30, 2015. NYSDOH acknowledged the request on September 30, 2015. NYSDOH sent a response letter dated October 23, 2015, indicating that no records have been located for the Site.

A summary of sites identified through the Federal and State regulatory agency database review is provided in the following table:

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
National Priorities List for Federal Superfund Cleanup (NPL)	03/26/2015	1 mile	0	No	No
Delisted NPL Site List	03/26/2015	1 mile	0	No	No
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), including CERCLIS NFRAP Sites	10/25/2013	½ mile	0/0	No	No
Resource Conservation and Recovery Information System – Corrective Action Activity (RCRIS CORRACTS) and Non-CORRACTS Treatment, Storage, or Disposal Facilities (RCRIS-TSD)	06/09/2015	1 mile / ½ mile	0/0	No	No
Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)	06/09/2015	¼ mile	2/1/2	No	**Yes**
RCRA Non-Generator	06/09/2015	¼ mile	11	No	**Yes**
Federal Institutional Control/Engineering Control Registries	06/09/2015	½ mile	0/0	No	No
Emergency Response Notification System (ERNS)	06/22/2015	Site	NA[1]	No	No
State Toxic Release Inventory System (TRIS)	12/31/2013	¼ mile	0	No	No
Hazardous Substance Waste Disposal Site Inventory (HSWDS)	01/01/2003	½ mile	0	No	No
New York State Inactive Hazardous Waste Disposal Sites (SHWS)	08/17/2015	1 mile	3	No	No
Solid Waste Management Facilities Sites (SWF/LF)	06/24/2015	½ mile	12	No	**Yes**
Vapor Reopened	11/01/2014	1 mile	1	No	No
New York State Spills Information (NY Spills)/Leaking Underground Storage Tanks (LTANKS)	08/17/2015	½ mile 1/8 mile	14/30	No	**Yes**
Petroleum Bulk Storage Tanks (USTs/ASTs)	07/29/2015	¼ mile	6/11	No	**Yes**
NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)	01/01/2002	¼ mile	0/1	No	**Yes**
NY Chemical Bulk Storage Tanks (NY CBS)	07/29/2015	¼ mile	2	No	**Yes**
Historic Bulk Storage Tanks (USTs/ASTs)	01/01/2002	¼ mile / Site	2/0	No	**Yes**
New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)	08/17/2015	1 mile	0/0	No	No
E-Designation Site (E)	05/27/2015	1/8 mile	39	**Yes**	**Yes**

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
Registered Dry Cleaners	07/02/2015	½ mile	0	No	No
EDR US Hist Auto Stat	NA	¼ mile	38	No	**Yes**
EDR US Hist Cleaners	NA	½ mile	1	No	**Yes**
NY Manifest	08/01/2015	¼ mile	18	No	**Yes**
NJ Manifest	12/31/2013	¼ mile	3	No	**Yes**
RI Manifest	12/31/2013	¼ mile	1	No	**Yes**
Manufactured Gas Plant Sites (Coal Gas)	NA[2]	1 mile	1	No	No

* The surrounding area search radius indicates the radial area (measured from the perimeter of the Site) for which the database review was performed.
[1]NA – Not Applicable
[2] This database consists of a compilation of historic resources (as early as the late 1800s) prepared by EDR that does not require updates. The last MGP in New York State ceased operations in 1972.

The Site is listed in the E-Designation database. The following subsections provide a discussion of the listings that have been identified within the search radii and are in the table above:

National Priorities List of Federal Superfund Cleanup (NPL)
The NPL is a subset of the CERCLIS, and lists properties that are ranked as high priority for cleanup under the federal Superfund program. Neither the Site nor any other facility within one mile of the Site is listed in the NPL Site List.

Delisted NPL Site List
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the USEPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425 (e), sites where no further response is appropriate may be deleted from the NPL. Neither the Site nor any other facility within one mile of the Site is listed in the Delisted NPL Site List.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
The CERCLIS list is a compilation of known and suspected uncontrolled or abandoned hazardous waste sites which are, or were, under investigation by USEPA but have not been elevated to the status of a Superfund (NPL) site. Former CERCLIS sites that have been granted the status of No Further Remedial Action Planned (NFRAP) are also included in the database. Neither the Site nor any other facility within one-half mile of the Site is listed in the CERCLIS or CERCLIs NFRAP databases.

Resource Conservation and Recovery Information System (RCRIS) – Treatment, Storage, or Disposal Facilities (TSD) and RCRIS Corrective Action Activity (CORRACTS)
The RCRA program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRIS database tracks facilities that treat, store, and/or dispose of hazardous waste as defined by RCRA (referred to as TSD facilities). The RCRIS CORRACTS database identifies TSD facilities that have conducted, or are currently conducting, corrective action(s) as regulated under RCRA.

Neither the Site nor any other facility within one mile of the Site is listed in the RCRIS CORRACTS database and neither the Site nor any other facility within one-half mile of the Site is listed in the RCRIS-TSD database.

Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)
This list includes operations that generate or transport hazardous waste for which a hazardous waste generator identification number or transporter permit is required. The RCRIS Gen/Trans listing is merely a listing of all facilities that, due to the amount of hazardous waste generated, are required to register with the USEPA for tracking purposes, but are not necessarily those with reported contamination incidents. The Site was not listed in the RCRIS Gen/Trans database.

Two (2) RCRA Large Quantity Generators (RCRA-LQG) were listed within a one-quarter mile radius of the Site. Based on their distance from the Site and lack of reported violations, these RCRA-LQG listings are not anticipated to have affected the environmental integrity of the Site.

One (1) RCRA Small Quantity Generator (RCRA-SQG) was listed within a one-quarter mile radius of the Site. The following RCRA-SQG facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
R&S Parts & Service Inc. dba Strauss Auto 168-08 Liberty Avenue Jamaica, NY 11433	1,024-ft/North-northwest	Up-gradient	K107	EPA ID: NYD980758080. The Site is also listed on the NY Manifest database. Facility generates spent halogenated solvents.

Two (2) RCRA Conditionally Exempt Small Quantity Generators (RCRA-CESQG) were listed within a one-quarter mile radius of the Site. The following RCRA-CESQG facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCTA 165-18 South Road Jamaica, NY 11433	849-ft/Northwest	Cross-gradient	J99	EPA ID: NYD980642268. The Site is also listed on the US AIRS, NJ Manifest, and RI Manifest databases. Facility generates cadmium, lead, and waste oils and has listed violations associated with its operations.

Based on its distance from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow direction, the other RCRA-CESQG listing is not anticipated to have affected the environmental integrity of the Site.

Resource Conservation and Recovery Information System Non-Generators / No Longer Reporting (RCRA NonGen / NLR)
RCRAInfo is USEPA's comprehensive information system, providing access to data supporting the RCRA of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the RCRA. Non-Generators do not presently generate hazardous waste. The Site is not listed in the RCRA NonGen / NLR database.

Eleven (11) RCRA NonGen / NLR facilities were identified within a one-quarter mile radius of the Site. The following RCRA NonGen / NLR facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	125-ft/North-northeast	Cross-gradient	A63	EPA ID: NYD981874407. The Site is also listed on the NY Manifest database.
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	182-ft/East	Cross-gradient	A9	EPA ID: NYD987030012. The Site is also listed on the NY Manifest database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	1,033-ft/Northwest	Up-gradient	L108	EPA ID: NYD986903763. The Site is also listed on the NY Manifest database. The facility is a retail gasoline filling station.

None of the other RCRA Non/Gen /NLR listings are anticipated to have affected the environmental integrity of the Site, based on their distances from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow directions.

Federal Institutional Control/Engineering Control Registries

The Federal Institutional Control/Engineering Control Registries are listings of sites with engineering controls and/or institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining at a site. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or affect human health. Neither the Site nor any other facility within one-half mile of the Site is listed in the Federal Institutional Control/Engineering Control Registries.

Emergency Response Notification System (ERNS)

The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances. The Site is not listed in the ERNS database.

New York State Toxic Release Inventory System (TRIS)

The Toxic Release Inventory System (TRIS) is a database used to collect information and report releases of toxic chemicals to the air, water, and land in reportable quantities. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the TRIS database.

Hazardous Substance Waste Disposal Site Inventory (HSWDS)
The list includes any known or suspected hazardous substance waste disposal sites. Also included are sites delisted from the Registry of Inactive Hazardous Waste Disposal Sites and non-Registry sites that USEPA Preliminary Assessment (PA) reports or Site Investigation (SI) reports were prepared. Hazardous Substance Waste Disposal Sites are eligible to be Superfund sites. The sites on the list will not automatically be made Superfund sites; rather each site will be further evaluated for listing on the Registry. Neither the Site nor any other facility within one-half mile of the Site is listed in the HSWDS database.

New York State Inactive Hazardous Waste Disposal Sites (SHWS)
The New York State Inactive Hazardous Waste Disposal Sites database, compiled by the NYSDEC, maintains information regarding the investigation and cleanup of suspected hazardous waste sites. The Site is not listed in the SHWS database.

Three (3) SHWS facilities were listed within a one-mile radius of the Site. Based on their distances from the Site (greater than one-half mile) and/or inferred down-gradient groundwater flow direction, these SHWS facilities are not anticipated to have affected the environmental integrity of the Site.

Solid Waste Management Facilities Sites (SWF/LF)
The SWF/LF database is a comprehensive listing of State permitted/recorded solid waste management facilities. The Site is not listed in the SWMF database.

Twelve (12) SWF/LF facilities were listed within a one-half mile radius of the Site. The following SWF/LF facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Taylor Auto Collision 104-21 Merrick Blvd. Jamaica, NY 11433	551-ft/North-northwest	Up-gradient	E67	The Site was engaged in vehicle dismantling. The Site is inactive.
Junk Yard International 169-09 Liberty Avenue Jamaica, NY 11433	1,172-ft/North	Up-gradient	O122	The Site was engaged in vehicle dismantling. The Site is inactive.
S&S Super Sports Auto Care Inc. 94-40 Merrick Blvd. Jamaica, NY 11433	1,308-ft/North-northwest	Up-gradient	P139	The Site was engaged in vehicle dismantling. The Site is inactive.

Based on their distances from the Site and/or inferred down-gradient groundwater flow direction, the other SWF/LF facilities are not anticipated to have affected the environmental integrity of the Site.

Vapor Reopened
New York is currently re-evaluating previous assumptions and decisions regarding the potential for soil vapor intrusion exposures at sites. As a result, all past, current, and future contaminated sites will be evaluated to determine whether these sites have the potential for exposures related to soil vapor intrusion. The Site is not listed in the Vapor Reopened database.

One Vapor Reopened facility was listed within a one-mile radius of the Site. The facility is identified as West Side Corp., and is located 3,375-ft east-northeast of the Site at 107-10 180th Street. This facility is

also listed in the NY UST and Historical UST databases. The site contains soil vapor and contaminated groundwater above guidance values. Based on its distance from the Site and/or inferred down-gradient groundwater flow direction, this Vapor Reopened listing is not anticipated to have affected the environmental integrity of the Site.

New York State Spills Information Database (NY Spills)/Leaking Underground Storage Tanks (LTANKS)
The NY Spills database, including LTANKS sites, was researched to identify listings within one-half mile of the Site. The database search identified 14 reported NY Spills and 30 LTANKS incidents within one-half mile of the Site. The Site is not listed in the NY Spills/LTANKs databases.

The following NY Spills / LTANKS facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	849-ft/Northwest	Cross-gradient	J98	Spill No. 9010039 was reported on 12/14/90. The spill was the result of a tank test failure. The spill is not closed. There are known petroleum-impacted soils and groundwater. NYCT has been operating a pump and treat system since 1995.

Based on distance from the Site combined with the assumed hydraulic relationship and/or the nature of the incident/regulatory status, none of the other facilities located within one-half mile of the Site identified in the NY Spills/LTANKS databases are expected to impact the environmental integrity of the Site.

Petroleum Bulk Storage Tanks (USTs/ASTs)
The NYSDEC PBS tank database was researched to identify listings for the Site and adjacent properties. The PBS Tank database is a listing of all facilities that are required to register their storage tanks for tracking purposes and not necessarily those with reported contamination incidents. The Site is not listed in the PBS tank database.

A total of 17 facilities (6 UST sites and 11 AST sites) were identified within one-quarter mile from the Site. The following UST facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BHELA 105-15 Merrick Blvd. Jamaica, NY 11433	269-ft/North	Up-gradient	B23	PBS No. 2-601509. The Site is an active retail gasoline filling station. The site has three (3) 4,000-gallon gasoline USTs and one (1) 4,000-gallon diesel UST. The Site is also listed on the NY AST database.

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	849-ft/Northwest	Cross-gradient	J100	PBS No. 2-190225. The site has five (5) 4,000-gallon diesel USTs and five (5) 4,000-gallon biodiesel UST. There are two (2) 15,000-gallon #6 fuel oil USTs and twelve (12) 2,000-gallon diesel USTs that are closed-in-place. There are two (2) 15,000-gallon #2 fuel oil USTs that are temporarily out-of-service. The site has a history of spills with one open spill case.
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	1,033-ft/Northwest	Up-gradient	L109	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-gallon #2 fuel oil UST that are all closed-in-place.

Based on distance from the Site, assumed hydraulic relationship, the lack of known releases with the potential to affect the Site, and/or current regulatory status, none of the other facilities identified within one-quarter mile of the Site in the PBS database are expected to impact the environmental integrity of the Site.

NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)

The NYSDEC chemical bulk storage (NY CBS UST/AST) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS UST/AST database lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons and/or in underground tanks of any size. The Site was not identified on the NY CBS UST/AST database.

One facility was listed within one-quarter mile of the Site. This NY CBS UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	849-ft/Northwest	Cross-gradient	J97	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS, and NY Spills databases.

NY Chemical Bulk Storage (NY CBS)
The NYSDEC chemical bulk storage (NY CBS) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons. The Site was not identified on the NY CBS database.

Two (2) facilities were listed within one-quarter mile of the Site. The following facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	849-ft/Northwest	Cross-gradient	J97	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Based on its distance from the Site, the other NY CBS listing is not anticipated to have affected the environmental integrity of the Site.

Historical Bulk Storage Tanks (USTs/ASTs)
These facilities have petroleum bulk storage capabilities in excess of 1,100 gallons and less than 400,000 gallons. This database contains detailed information per site. This database is no longer updated. More current data is presented in the PBS UST/AST databases. The Site is not listed in the HIST UST/AST databases.

The database identified the presence of two (2) historic UST facilities located within one-quarter mile of the Site. This HIST UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	1,033-ft/Northwest	Up-gradient	L109	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-gallon #2 fuel oil UST that are all closed-in-place.

Based on its distance from the Site, the other HIST UST listing is not anticipated to have affected the environmental integrity of the Site.

New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)
The Voluntary and Brownfield remedial programs involve mostly private entities and private funds to remediate contaminated sites and return the properties to productive use. The NYSDEC VCP/BCP

database was researched to identify listings for the Site and within a one-mile radius of the Site. Neither the Site nor any other facility within one mile of the Site is listed in the VCP/BCP databases.

E-Designation Site Listing (E-Designation)
The E (Environmental) Designation would ensure that sampling and remediation take place on the subject properties, and would avoid any significant impacts related to hazardous materials at these locations. The E-designations require that the owner of the sites conduct testing and sampling following set protocols, to the satisfaction of city agencies. In addition, the owner must remediate when appropriate. The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing for the Site for hazardous materials is considered to be a REC/VEC.

The database identified thirty-eight (38) other E-Designation listings within a one-eighth-mile radius of the Site. The listings are associated with E-designation reference No. E-39 (Underground Gasoline Storage Tanks Testing Protocol) and E-175 (Underground Gasoline Storage Tanks Testing Protocol). The listed sites are all considered as RECs/VECs with respect to the Site.

Registered Dry Cleaners
The NYSDEC registered dry cleaners database was researched to identify listings within one-quarter mile of the Site. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the dry cleaners database.

EDR Exclusive Historic Auto Stations (EDR US Hist Auto Stat)
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is not listed in the EDR US Hist Auto Stat database.

The database search identified 38 listings within one-quarter mile of the Site. The EDR Hist Auto Stat facilities that are considered RECs/VECs with respect to the Site are as follows:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
106-04 Merrick Blvd. Jamaica, NY 11433	125 feet/ North-northeast	Down-gradient	A2	Identified as Birds Auto Repair. Listed for years 1999-2012.
106-03 Merrick Blvd. Jamaica, NY 11433	177 feet/ North-northeast	Down-gradient	A7	Identified as Truck Repair Services. Listed for years 2011 and 2012.
105-17 Merrick Blvd. Jamaica, NY 11433	276 feet/ North	Cross-gradient	B24	Identified as Fred's Auto Repair. Listed for year 2002.
105-02 Merrick Blvd. Jamaica, NY 11433	279 feet/ North-northwest	Cross-gradient	B28	Identified as Garvey's Auto Repair and Ralke Auto Repairs. Listed for years 1999, 2000, 2011, and 2012.

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
105-15 Merrick Blvd. Jamaica, NY 11433	280 feet/ North	Cross-gradient	B29	Identified as Citgo Gas Station and Henrys Repair Shop. Listed for years 1999-2001.
105-09 Merrick Blvd. Jamaica, NY 11433	290 feet/ North	Cross-gradient	B32	Identified as Inter City Tire Corp. Listed for year 2006.
107-17 Merrick Blvd. Jamaica, NY 11433	304 feet/ East-southeast	Down-gradient	C36	Identified as E&D Auto Seat Cover, Dave's Precision Auto Service Inc., Inspection City Auto Repair Inc., and Haldane Auto Service. Listed for years 1999-2008 and 2010-2012.
107-35 Merrick Blvd. Jamaica, NY 11433	409 feet/ East-southeast	Down-gradient	C44	Identified as Mystique Auto Body Works Corp. Listed for years 1999-2002, 2004, 2005, and 2009.
107-55 Merrick Blvd. Jamaica, NY 11433	532 feet/ East-southeast	Down-gradient	F62	Identified as General Auto Body Works Listed for years 1999, 2000, 2002-2005, 2009-2012.
104-28 Merrick Blvd. Jamaica, NY 11433	534 feet/ North-northwest	Cross-gradient	E63	Identified as AAA Transmissions & Engines. Listed for years 2004, 2005, and 2009.
107-57 Merrick Blvd. Jamaica, NY 11433	546 feet/ East-southeast	Down-gradient	F65	Identified as Birds Auto Repair Listed for years 2003 and 2005-2012.
104-21 Merrick Blvd. Jamaica, NY 11433	555 feet/ North-northwest	Up-gradient	E70	Identified as Taylor Auto Collision Inc. Listed for years 1999-2002, 2004-2009, and 2011.
104-19 Merrick Blvd. Jamaica, NY 11433	560 feet/ North-northwest	Up-gradient	E72	Identified as Full Line Auto Repairs. Listed for years 1999-2001, 2003-2007, and 2009-2012.
104-15 Merrick Blvd. Jamaica, NY 11433	574 feet/ North-northwest	Up-gradient	E76	Identified as Dynamic Autoworks Inc., Ace Auto Body & Truck Repair, Jimmy's Trans & Auto Repair, and Sports Line Auto Repair. Listed for years 1999-2005, 2008, 2010, and 2012.
107-61 Merrick Blvd. Jamaica, NY 11433	577 feet/ East-southeast	Down-gradient	F78	Identified as D&G Foreign Auto Repair. Listed for years 2010-2012.
104-13 Merrick Blvd. Jamaica, NY 11433	579 feet/ North-northwest	Up-gradient	E79	Identified as Full Line Auto Repairs. Listed for year 2002.
104-09 Merrick Blvd. Jamaica, NY 11433	592 feet/ North-northwest	Up-gradient	E83	Identified as Junior Auto Collision, RJS Car Care Center Inc., L&C Auto Collision, NASCAR Auto Body Inc., and Integrity Collision & Towing. Listed for years 2001-2012.

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
107-65 Merrick Blvd. Jamaica, NY 11433	608 feet/ Southeast	Down-gradient	F88	Identified as H&S Auto Trans & Repair, New Queens Village Auto Service, and Queens Village Auto Radiator. Listed for years 2001, 2005, and 2010-2012.

Due to their distances from the Site and/or the presumed groundwater flow direction none of the other EDR Hist Auto Stat facilities are considered RECs/VECs with respect to the Site.

EDR Exclusive Historic Dry Cleaners (EDR US Hist Cleaners)
EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is not listed in the EDR US Hist Cleaners database.

The database search identified one (1) listing within one-half mile of the Site. This facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
107-37 166th Street Jamaica, NY 11433	480 feet/ South	Down-gradient	D51	Identified as ABD Cleaners Corp. Listed for year 2009.

NY Manifest
The NY Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the NY Manifest database.

Eighteen (18) NY Manifest facilities were identified within one-quarter mile of the Site. The following NY Manifest facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	125-ft/North-northeast	Cross-gradient	A3	EPA ID: NYD981874407. The Site is also listed on the RCRA NonGen / NLR database.
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	182-ft/East	Cross-gradient	A9	EPA ID: NYD987030012. The Site is also listed on the RCRA NonGen / NLR database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
				spent non-halogenated solvents.
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	1,033-ft/Northwest	Up-gradient	L108	EPA ID: NYD986903763. The Site is also listed on the RCRA NonGen / NLR database. The facility is a retail gasoline filling station.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NY Manifest facilities are expected to impact the environmental integrity of the Site.

NJ Manifest

The NJ Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the NJ Manifest database.

Three (3) NJ Manifest facilities were identified within one-quarter mile of the Site. The following NJ Manifest facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCT 165-18 South Road Jamaica, NY 11433	849-ft/Northwest	Cross-gradient	J99	The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NJ Manifest facilities are expected to impact the environmental integrity of the Site.

RI Manifest

The RI Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility. The Site is not listed in the RI Manifest database.

One (1) RI Manifest facility was identified within one-quarter mile of the Site. The following RI Manifest facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCT 165-18 South Road Jamaica, NY 11433	849-ft/Northwest	Cross-gradient	J99	The site is also listed in the NY AST, NY CBS AST, and NY Spills databases.

Manufactured Gas Plant Sites (Coal Gas)
Manufactured gas sites were used in the United States from the 1800's to the 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water and produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils, and other compounds are potentially hazardous to human health and the environment. The byproducts were frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination. The Manufactured Gas Plant (MGP) Sites database was researched to identify any listings for the Site and within a one-mile radius of the Site. The Site is not listed in the MGP database.

One (1) facility within one mile of the Site is listed in the MGP database. The facility is identified as Jamaica Gas and Light and is located approximately 3,261-ft west of the Site at Beaver Road and 158th Street. Due to its distance from the Site and/or the presumed groundwater flow direction this facility is not considered a REC/VEC with respect to the Site.

Orphan Listings
A review of the Orphan Listings in the database search report indicated a total of four (4) listings. The Orphan sites are not considered RECs based on their estimated distances from the Site (none adjacent or on the Site block) and/or the nature of the activity/release.

6.2 Local Regulatory Agency Research

A review of local records for the Site was accomplished by contacting offices of New York City regulatory agencies including the NYCDOB, NYCDEP, Department of Health and Mental Hygiene (NYCDOHMH), NYCDCP, and the Fire Department (FDNY). The results of the review of local records are presented below. Copies of the correspondences are included in *Appendix K*.

New York City Department of Buildings (NYCDOB)
NYCDOB records were reviewed on November 13, 2015 to determine whether there are references to buildings, tanks or other structures, property use or inspection reports that indicate the presence, past use, or release of hazardous substances, wastes, or petroleum products at the Site. The NYCDOB records review indicated that the Site has five (5) NYCDOB violations. These violations are for construction violations for working without a permit. There were no RECs identified as a result of review of NYCDOB records. Copies of the NYCDOB records are included in *Appendix J*.

New York City Department of Environmental Protection (NYCDEP)
The NYCDEP maintains files of incidents involving environmentally regulated materials. The records maintained by NYCDEP include reports of spills of hazardous chemicals and citizen's complaints on environmental issues. NYCDEP information concerning the Site was requested in a formal application for records dated October 1, 2015. At the time this report was issued, STV had not yet received a response from NYCDEP. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of Health and Mental Hygiene (NYCDOHMH)
The NYCDOHMH, Bureau of Environmental Investigations (BEI) maintains files of health-related environmental incidents in the City of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYCDOHMH information concerning the Site was requested in a formal FOIL request form dated October 1, 2015. NYCDOHMH acknowledged the request on October 6, 2015. At the time this report

was issued, STV had not yet received any response from NYCDOHMH. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of City Planning (NYCDCP)

STV reviewed the NYCDCP Zoning Map 14d, available via the NYCDCP on-line web-site. According to the map, the Site is currently located within zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

"E" designations for blocks or lots on city zoning maps were issued since approximately March 2003 and indicate that potential environmental issues are associated with these parcels. The environmental issues may or may not be associated with potential contamination by hazardous or petroleum substances. Parcels with "E" designations require that the fee owner of the site conduct a testing and sampling protocol, and remediation where appropriate, to the satisfaction of the New York City Office of Environmental Remediation (NYCOER) before the issuance of a building permit by the NYCDOB pursuant to the provisions of Section 11-15 of the Zoning Resolution (Environmental Requirements).

The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing for the Site for hazardous materials is considered to be a REC/VEC.

New York City Fire Department (FDNY)

The FDNY maintains information concerning petroleum USTs. STV submitted a Fuel Oil Record Search Request Form to the FDNY on October 1, 2015 for information concerning the Site. At the time this report was issued, STV had not yet received a response from FDNY. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

7.0 USER RESPONSIBILITIES

7.1 Environmental Liens or Activity and Use Limitations

An Environmental Lien Search Report was obtained from EDR for the Site. The Environmental Lien Search Report provides results from a search of available and current land title records for environmental liens and other activity and use limitations, such as engineering controls and institutional controls. A review of the report indicates that no environmental liens or other activity and use limitations were found for the Site. A copy of the environmental lien search report is included in *Appendix J*.

7.2 Valuation Reduction for Environmental Issues

No information was available at the time of the assessment regarding the relationship of the purchase price of the property to the fair market value of the property. If information is received regarding valuation reduction for environmental issues which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.3 Knowledge or Experience of the User

No person with specialized knowledge or experience that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.4 Commonly Known or Reasonably Ascertainable Information

No person within the local community with commonly known or reasonably ascertainable information about the property that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.5 The Degree of Obviousness of the Presence or Likely Presence of Contamination at the Property

NYCT is not currently aware of any obvious indicators that point to the presence or likely presence of new or imminent releases at the property. Additionally, NYCT is not currently aware of any obvious indicators important to the screening of VECs in connection with the property.

8.0 SITE RECONNAISSANCE AND INTERVIEWS

8.1 Methodology and Limiting Conditions

The inspection of the Site included observations of the property and surrounding area (Site reconnaissance) that were made to identify potential sources or indications of hazardous substances, including: ASTs; USTs; tank vents and fill ports; transformers and other items that could contain PCBs; waste storage areas; hazardous materials usage, storage, and disposal; stained surfaces and soils; stressed vegetation; leaks; and, odors. In addition, readily-observable portions of the properties immediately adjacent to the Site were viewed from public rights-of-way to identify or determine the likelihood of any of the aforementioned potential sources of contamination being present. There were no limiting conditions with respect to impact on the accuracy of the Site reconnaissance.

8.2 Site Reconnaissance

Mr. Doane Cafferty of STV performed the Site visit on November 12, 2015. A request for access to the Site was communicated in a letter dated October 27, 2015 that was mailed to Mr. Fred Bauerschmidt (the property owner). At the time this visit was conducted, STV had not yet received a response from Mr. Bauerschmidt. Consequently, the site inspection was conducted from the public sidewalk in front of the Site. At the time of the inspection, the weather was approximately 50º F with sunny skies. The weather did not prevent STV from conducting a thorough inspection of the Site and surrounding areas. *Appendix C* provides representative photographs of the Site.

Block 10164, Lot 95 is an approximately 2,600 square-foot (sf) property that is used for parking for vehicles that are being serviced at the business located on the adjoining property (Calvin Auto Body at 106-04 Merrick Blvd.).

The Site is bound to the north by a mixed-use residential/commercial building followed by bus depot parking lots, a one-story commercial office building, a parking lot, custom wheel, tire, and rim supply and repair shop and several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by an auto collision repair shop followed by Merrick Boulevard and subsequently a parking lot, various auto repair facilities, and a retail gasoline station; to the south by 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street.

8.3 Current and Historical Use Interviews

The following knowledgeable persons were interviewed with regard to the Site pursuant to ASTM 1527-13 Section 10:

8.3.1 Current Property Owner

The subject property is currently owned by 'Bauerschmidt Realty Holding Corp.'. Based on the research, this entity has owned the Site since at least 1994. All prior ownership information reviewed is presented in *Appendix J*. The review of current and historical ownership and tax records information did not reveal evidence of RECs or VECs associated with prior use of the Site.

8.3.2 Current Site Operator or Key Site Manager

Name	Title/Company	Years Associated with Site
Mr. Fred Bauerschmidt	Owner	Approx. 21

Detailed information provided during the above-listed interview is documented on Record of Communication forms in *Appendix K*.

8.3.3 Site Occupants

Other than the Owner's representative, Site occupants were not available to interview during this assessment.

8.3.4 Past Owners, Operators and Occupants

Past owners or occupants of the Site were not available to interview during this assessment. STV was unable to obtain contact information from any previous owners or occupants.

8.3.5 Report User

Name	Title/Company	Years Associated with Site
Mr. Emil Dul	NYCT Real Estate Department	<1

According to the ASTM E 1527-13 User Questionnaire provided by Mr. Emil Dul of NYCT's Real Estate Department, NYCT is not aware of any environmental liens, land use limitations, specialized knowledge, or past uses of the Site. Detailed information provided during the above-listed interviews is referenced in applicable sections of this report and a copy of the completed ASTM E1527-13 User Questionnaire is included in *Appendix K*.

8.4 Hazardous Substances and Petroleum Products Storage and Handling

8.4.1 Hazardous Substances

No hazardous substances were stored or located on the Site. There was no visual or olfactory evidence of leakage or staining anywhere on the Site. STV concludes that storage and handling of hazardous substances do not represent a REC or VEC for the Site.

8.4.2 Petroleum Products Storage and Handling

No evidence of petroleum product storage was observed at the Site. STV concludes that storage and handling of petroleum products does not represent a REC or VEC for the Site.

8.5 Solid Waste Generation, Storage and Disposal

No containers for solid waste were observed on the Site. Solid waste generation, storage, and disposal are not considered a REC or a VEC with respect to the Site.

8.6 Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are toxic components of various products including, but not limited to caulking materials, light ballasts, and dielectric and hydraulic fluids that were formerly used in electrical equipment such as transformers and hydraulic elevators/lifts. The manufacture and use of PCBs was banned in the United States in 1978.

STV did not observe any electrical transformers on or adjacent to the Site. Potential buried structures and historic fill on the property could include PCB-containing materials and is considered an environmental concern with respect to the Site.

8.7 Asbestos-Containing Material (ACM)

STV conducted a limited visual survey (i.e., within accessible areas only) for the presence of suspect ACM within the Site. The intent of the survey was to identify exposed suspect ACM through preliminary non-destructive observations. No sampling of suspect ACM was performed during this investigation. Pursuant to applicable asbestos control regulations and guidelines, STV considered any observed suspect materials to be asbestos-containing.

Potential ACM at the Site likely consists of historical fill material. Based on the fact that the fill material is of an unknown origin, the suspect ACM identified at the Site is considered an environmental concern.

8.8 Lead-Based Paint (LBP) Survey

During the Site inspection, there was no evidence of painted surfaces since the land is vacant. Potential buried structures and historic fill on the property could include LBP and is considered an environmental concern with respect to the Site.

8.9 Regulatory Compliance

STV does not consider regulatory compliance to be an environmental concern for the Site.

8.10 Electromagnetic Fields

A visual inspection was performed for the presence of high voltage power lines and or substations located in close proximity to the Site. No such power lines or substations were identified; therefore, STV does not consider electromagnetic fields to be an environmental concern at the Site.

8.11 Other Environmental Concerns (Methane, Mold, etc.)

Based on a review of the historic topographic map and knowledge of the area, the Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site.

As part of this assessment, STV conducted a limited assessment for the presence of water damage and odors, indicative of the potential for mold growth, on accessible surfaces within the Site. There was no evidence of water damage or mold noted during the Site inspection.

9.0 SUMMARY OF FINDINGS

The Site is located at 166-15 Merrick 107th Avenue, Jamaica, Queens, New York 11433 (Block 10164, Lot 95). Block 10164, Lot 95 is an approximately 2,600 square-foot (sf) property that is used for parking for vehicles that are being serviced at the business located on the adjoining property (Calvin Auto Body at 106-04 Merrick Blvd.).

The Site is bound to the north by a mixed-use residential/commercial building followed by bus depot parking lots, a one-story commercial office building, a parking lot, custom wheel, tire, and rim supply and repair shop and several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility; to the east by an auto collision repair shop followed by Merrick Boulevard and subsequently a parking lot, various auto repair facilities, and a retail gasoline station; to the south by 107th Avenue; and to the west by the Jamaica Bus Depot followed by residential dwellings and subsequently 165th Street.

NYCDCP Zoning Map 14d indicated the Site is designated as zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol).

The Site is generally flat and the topography of the surrounding area slopes to the south-southeast. According to the USGS 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, and information contained in the regulatory agency database report, the Site elevation is approximately 28 feet amsl.

The nearest surface water body is a pond in Captain Tilly Park, located approximately 5,045 feet north-northwest of the Site. Based on topography, the groundwater flow in the area of the Site is assumed to be south-southwest towards Jamaica Bay. The depth to groundwater is estimated to range from approximately 20-25 feet bgs.

The Phase I ESA identified on-Site RECs pertaining to potential buried structures from former buildings that could contain underground storage tanks and/or historic fill materials of unknown origin and the Site's listing with an E-Designation for underground storage tanks testing protocol.

Off-site RECs include three solid waste management facilities; a nearby facility with an open spill; one facility that currently generates spent halogenated solvents; one facility that historically generated cadmium, lead, and waste oils; an active gas station; several historical and current auto repair facilities; one historic dry cleaner; several nearby properties with E-Designation listings for underground storage tanks testing protocol; and the historical presence of a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs in close proximity to the Site. The Phase I ESA revealed environmental concerns associated with suspect ACM, LBP, PCB-containing materials.

10.0 CONCLUSIONS AND RECOMMENDATIONS

STV has performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527-13 and the requirements of NYCT. Any additions to, exceptions to, or deletions from this practice are described in Section 2.0 of this report.

The Phase I ESA has revealed the following RECs, CRECs, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The Site property was previously developed with a low-rise structure. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The Site is listed with an E-Designation (CEQR No. 90-087Q) for E-39 (Underground Gasoline Storage Tanks Testing Protocol). The E-Designation listing is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that generates spent halogenated solvents is located in close proximity to the Site and is considered a REC/VEC.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- A facility with an open spill is located northwest of the Site at 165-18 South Road. This property is considered a REC/VEC based on its proximity to the Site and hydraulically cross-gradient position with respect to the Site.

- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Potential buried structures and historic fill on the property could include ACM, LBP and/or PCB-containing materials.

Recommendations

STV recommends performing a Phase II Environmental Site Investigation, consisting of a geophysical survey and the collection and analysis of soil and groundwater samples to determine whether the identified RECs have impacted the value of the Site or the development and use of the Site.

11.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

STV Incorporated (STV) has performed a Phase I ESA of the property located at 166-15 107th Avenue, Jamaica, Queens, New York 11433 (Block 10164, Lot 95). The scope of the Phase I ESA was consistent with the requirements of ASTM Standard Practice E 1527-13 and of NYCT. Signatures of the Environmental Professionals who participated in conducting this Phase I ESA are provided below. Qualifications for these individuals are provided in *Appendix L*. STV declares that to the best of their professional knowledge and belief, they meet(s) the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. STV has the specific qualifications based on education, training and experience to assess the subject property. STV has developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

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Prepared By:
Doane E. Cafferty, LEED AP BD+C
Senior Environmental Scientist

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Reviewed By:
Christine Vilardi, P.G., LEED Green Associate
Quality Control Officer

_____

Reviewed By:
Peter S. Helseth, P.E.
Senior Project Manager

12.0 REFERENCES

Persons Interviewed:

- Mr. Fred Bauerschmidt, Owner, 106-04 Merrick Blvd., Jamaica, Queens, New York, DATE TBD.

Resources Consulted:

- EDR – Radius Map™ Report with GeoCheck®, September 29, 2015.
- EDR – Historical Sanborn® Maps: 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006.
- EDR – Aerial Photographs: 1924, 1951, 1954, 1961, 1966, 1975, 1984, 1994, 2006, 2009, and 2011.
- EDR – USGS Historical Topographic Maps: 1900, 1924, 1947, 1957, 1966, 1979, and 1994.
- EDR – City Directories: 1922, 1934, 1939, 1945, 1950, 1962, 1967, 1970, 1976, 1983, 1991, 1996, 2000, 2005, 2008, and 2013.
- EDR - Environmental Lien Search dated September 30, 2015.
- NYC Department of Finance – Assessment Roll: 2006-2015.
- Oasis Website - www.oasisnyc.net/OASISMap.htm.
- FEMA Map Services Center Website - www.msc.fema.gov
- National Wetlands Inventory Website - www.fws.gov/nwi/
- USGS New York Water Science Center http://ny.ims.er.usgs.gov/li-dtw/ and http://ny.ims.er.usgs.gov/LI_maps06

Regulatory Agencies Contacted:

- New York City Department of Buildings, October 1, 2015.
- New York City Fire Department, October 1, 2015.
- New York City Planning and Zoning Department, October 1, 2015.
- New York City Department of Environmental Protection, October 1, 2015.
- New York City Department of Health and Mental Hygiene, October 1, 2015.
- New York State Environmental Conservation, October 1, 2015.
- New York State Department of Health, October 1, 2015.
- Unites States Environmental Protection Agency, October 1, 2015.

Documents and Maps:

- ASTM International (ASTM) 2013, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," ASTM Designation E 1527-13.
- ASTM E 2600-10 "Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions."
- STV Potential Property Acquisition Eight Properties Near Jamaica Bus Depot, Jamaica, New York, dated February 17, 2012
- U.S. Geological Survey, Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, Charles Baskerville, 1994. USGS I 2306.
- U.S. Geological Survey, Groundwater in Bronx, New York and Richmond Counties with Summary Data on Kings and Queens Counties, New York City, New York, Nathaniel Perlmutter and Theodore Arnow, 1953. USGS 6W-32.

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- USGS LI Depth-to Water Tool for Long Island (USGS, 2013).

13.0 APPENDICES

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Phase I ESA - Jamaica Bus Depot

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PHASE I ENVIRONMENTAL SITE ASSESSMENT
OF

JAMAICA BUS DEPOT RECONSTRUCTION
165-18 SOUTH ROAD
BLOCK 10164, LOTS 46, 80, 84, 97 & 103
QUEENS, NEW YORK 11433

CONTRACT NO.: CCM-1411/D-81411
TASK ORDER NO.: 18
CONSULTANT PROJECT NO.: 40-17555-1000

AUGUST 24, 2016

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1.0 EXECUTIVE SUMMARY

At the request of New York City Transit (NYCT), STV Incorporated (STV) conducted a Phase I Environmental Site Assessment (ESA) of the Jamaica Bus Depot located at 165-18 South Road, Jamaica, Queens, New York 11433 (hereafter referred to as the "Site"). The legal description of the Site is Block 10164, Lots 46, 80, 84, 97, and 103. NYCT is evaluating the feasibility of reconstructing the Jamaica Bus Depot to meet the expanding needs of the existing Jamaica Bus Depot site and to meet current bus depot guidelines.

The Site is comprised of five (5) contiguous lots that total approximately 171,461 square feet (SF). The Jamaica Bus Depot building is an approximately 58,000 SF single story structure constructed in 1939. The Site is owned by "The City of New York" (Lot 46 and 103) or "New York City Transit Authority" (Lots 80, 84, and 97) according to the Environmental Data Resources (EDR) Environmental Lien Search. Historically, the Site was occupied by a vacant land, residential dwellings, low-rise buildings with commercial storefronts, and a gasoline filling station. The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

The main objective of the Phase I ESA is to identify *recognized environmental conditions (RECs)* and environmental concerns that may affect the suitability of the Site for redevelopment. RECs are defined in ASTM International (ASTM) Standard Practice E 1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property. Note that *controlled recognized environmental conditions (CRECs)* are considered to be RECs and are listed in the Executive Summary and Conclusions of this Phase I ESA. Additionally, *vapor encroachment conditions (VECs)* were evaluated as per ASTM E 2600-10.

Other environmental issues and conditions that, in the opinion of the *environmental professional* conducting the assessment, would not be considered *RECs* are identified in this assessment. These may include *historical RECs* and/or *de minimis* conditions. The Phase I ESA also includes a preliminary evaluation of specific potential environmental issues or conditions that are, according to ASTM E 1527-13, considered non-scope considerations. These issues include radon, asbestos-containing material (ACM), polychlorinated biphenyl- (PCB-) containing light ballasts and caulking materials, exterior lead-based paint (LBP), chemical storage, wetlands, regulatory compliance issues, dry cleaner and other industrial emissions, mold, biological agents, electromagnetic fields, and methane. The Phase I ESA included a review of Federal, State, and local records, previous reports and historical documents; visual observation of the Site and adjoining properties; and, interviews with selected Site representatives.

The assessment requested by NYCT is intended to identify conditions that would have the potential to impact the value of the Site or the redevelopment and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included evaluation of the following: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-site solid waste management and disposal practices; on-site hazardous materials and petroleum products management; chemical storage, ACM, PCBs and exterior LBP management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions; radon; mold and moisture intrusion; biological agents; electromagnetic fields; and, potential for methane generating materials.

Summary of RECs, CRECs, VECs and Environmental Concerns

This Phase I ESA has revealed the following RECs, CRECS, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The Site has an open spill case (Spill No. 9010039) that is currently being remediated via a pump and treat remediation system under a New York State Department of Environmental Conservation (NYSDEC) Global Consent Order (CO2-20000101-3341).

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The historic use of a portion of the Site as a gasoline filling station is considered a REC/VEC.

- The Site is listed in multiple Federal and State regulatory agency databases. The current and historic use of the Site as a bus service station and maintenance garage is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- Two (2) facilities that generate spent halogenated solvents are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- One (1) historic dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Suspect ACM consisting of tile grout, tile mortar, pipe insulation, caulking, vinyl floor tiles, mastic, and gypsum board and joint compound exists throughout the Site.
- Based on the age of the Site building (circa 1939), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.
- Fluorescent lighting fixtures and window caulking identified throughout the building may contain PCBs.

STV recommends that the Site continue with the efforts currently being implemented under the NYSDEC Global Consent Order (CO2-20000101-3341). In order to avoid adverse impacts from any contamination, any reconstruction activities involving disturbance of existing soils should be conducted in accordance with a site-specific Construction Health and Safety Plan, which would detail measures to reduce the potential for exposure (e.g., dust control) and to identify and manage known contamination and unexpectedly encountered contamination. Erosion and sediment control measures and storm water management measures should be implemented during any subsurface construction activities to protect nearby storm water drains from contaminants potentially entrained in storm water runoff. To eliminate the potential for exposure of future Site occupants, a minimum of two (2) feet of clean soil underlain by a demarcation liner should be placed on any areas that will not be covered by paved surfaces or permanent structures associated with any new Site construction. Prior to or during construction activities, any underground and aboveground storage tank systems should be removed and disposed of in accordance with applicable Federal, State, and local regulations. If associated contaminated soil and/or groundwater are discovered during the tank removal, they should be remediated according to the requirements of the NYSDEC Spill Response and Remediation program. Post removal endpoint soil samples should be collected to ensure that soil exceeding applicable guidance values/standards is removed. All contaminated materials removed from the Site should be properly transported and disposed of offsite in accordance with all applicable Federal, State, and local regulations. STV further recommends that any ACM, LBP, and/or PCB-containing materials affected by future renovations, repairs or demolition at the Site be identified and properly managed during such activities.

2.0 INTRODUCTION

This report summarizes the results of the Phase I Environmental Site Assessment (ESA) of the Jamaica Bus Depot located at 165-18 South Road, Jamaica, Queens, New York 11433 (Block 10164, Lots 46, 80, 84, 97, and 103) (hereafter referred to as the "Site").

The Site is comprised of five (5) contiguous lots that total approximately 3.94 acres as follows:

Block/Lot	Address	Lot Area [Square Feet (SF)]	Zoning Designation
10164/46	165-18 South Road	114,000	M1-1
10164/80	105-12 Merrick Boulevard	14,015	M1-1
10164/84	105-14 Merrick Boulevard	19,692	M1-1
10164/97	107th Avenue	18,350	M1-1
10164/103	166-07 107th Avenue	5,404	M1-1

Lot 46 contains a single-story depot building constructed in 1939. Lot 80 contains a diesel and heating oil tank vault and pump room building. Lots 84, 97, and 103 are open lots used for parking of buses.

The existing depot is over capacity, inefficiently configured in terms of functional operation, and lacks appropriate bus maintenance services. The bus depot currently maintains and services approximately 196 buses; however, the property cannot accommodate on-site parking for the current bus fleet, and approximately 50 buses and numerous employee vehicles park on the surrounding neighborhood streets. The depot's transportation and maintenance employee amenities are in poor condition and in need of renovation. Also, the depot does not meet the United Bus Depot Design Guidelines and current code standards. NYCT is evaluating the feasibility of reconstructing the Jamaica Bus Depot to meet the expanding needs of the existing Jamaica Bus Depot site and to meet current bus depot guidelines.

The Site is located in an area that is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the York College campus, and the Montauk and Ronkonkoma Lines of the Long Island Railroad (LIRR).

Mr. Doane Cafferty of STV performed the Site visit on August 2, 2016, and was accompanied by Mr. Kenneth Lam, the Jamaica Bus Depot superintendent, Mr. John Hu and Ms. Mary Kong with NYCT, several STV engineers representing various disciplines, and Ms. Julie Abell Horn with Historical Perspectives, Inc. The weather was approximately 85º F with sunny skies; there were no limitations caused by the weather.

2.1 Selected Definitions

The following terms are used throughout this report and, for the purpose of clarity, corresponding definitions are provided. These terms are fully defined in ASTM E 1527-13 and ASTM E 2600-10.

Controlled Recognized Environmental Condition (CREC) – A recognized environmental condition resulting from a past *release* of *hazardous substances* or *petroleum products* that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority) with *hazardous substances* or *petroleum products* allowed to remain in place subject to the implementation of

required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Historical Recognized Environmental Condition (HREC) – A past *release* of any *hazardous substances* or *petroleum products* that occurred in connection with the *property* and has been addressed to the satisfaction of the applicable regulatory authority, without subjecting the *property* to any required controls (for example, *property use restrictions*, *activity and use limitations, institutional controls, or engineering controls*).

Recognized Environmental Condition (REC) – The presence or likely presence of any *hazardous substances* or *petroleum products* in, on, or at a *property:* (1) due to any *release* to the *environment*; (2) under conditions indicative of a *release* to the *environment*; or, (3) under conditions that pose a *material threat* of a future *release* to the *environment*.

Environmental Professional - A person meeting the education, training, and experience requirements as set forth in 40 CFR § 312.10(b), necessary to conduct a *site reconnaissanc*e, *interview*s, and other activities in accordance with this practice, and from the information generated by such activities, having the ability to develop opinions and conclusions regarding conditions indicative of releases or threatened releases on, at, in, or to a property, sufficient to meet the objectives and performance factors in 40 CFR § 312.20(e) and (f).

Vapor Encroachment Condition (VEC) - The presence or likely presence of chemical of concern vapors in the subsurface of the target property caused by the release of vapors from contaminated soil or groundwater or both either on or near the target property.

2.2 Purpose and Scope

The purpose of this assessment is to identify RECs, CRECs, VECs, and certain other environmental issues or concerns as they existed at the Site at the time of the Site visit. The assessment is intended to identify conditions that would have the potential to impact the value of the Site or the redevelopment and use of the Site. The assessment was also conducted for purposes of environmental due diligence in order to qualify for the innocent landowner, a bona fide prospective purchaser, or a contiguous property owner defense under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The Phase I ESA included, but was not limited to an assessment of the following potential environmental issues: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-Site solid waste management and disposal practices; on-Site hazardous materials and petroleum products management; asbestos-containing material (ACM), polychlorinated biphenyl (PCB)-containing equipment and lead-based paint (LBP) management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions, radon, mold and moisture intrusion; biological agents; electromagnetic fields; and the potential for methane generating materials.

This evaluation was conducted by qualified *environmental professionals* utilizing a standard of good commercial and customary practice in accordance with ASTM E 1527-13. The scope of work completed for this evaluation meets all requirements of ASTM E 1527-13 and includes the following:

- Documenting the physical characteristics of the Site through a review of available topographic, geologic, wetland, flood plain, groundwater data and Site observations.

- Researching the Site history through a review of reasonably ascertainable standard sources such as land deeds, fire insurance maps, city directories, aerial photographs, prior reports and interviews.

- Documenting current Site conditions, via observations and interviews, regarding the presence or absence of hazardous substances/petroleum products; the generation, treatment, storage, or disposal of hazardous, regulated, or medical wastes; the presence of electrical equipment that utilizes oils which potentially contain PCBs; and, the presence of storage tanks (above and below ground), floor drains, drains that discharge to subsurface, former septic tanks and drywells.

- Determining the usage of adjoining and nearby properties to identify the likelihood for environmental conditions (if present and/or suspected) and concerns to migrate onto the Site.

- Evaluating information contained within Federal and State environmental databases and other local environmental records, within specific search distances.

2.3 Additions, Deviations, Deletions, Data Failures, and Data Gaps

The following environmental issues that are outside the scope of (additions to) ASTM E 1527-13 were evaluated:

- A review of available radon data for the Site vicinity.
- A review of available wetlands data.
- A visual assessment for water damage and mold.
- A visual assessment for suspect ACM.
- A visual assessment for suspect LBP.
- An assessment of potential methane generation on-Site or migration to the Site.
- Regulatory compliance.
- PCB light ballasts and caulking materials.
- Biological agents (mold, pigeon guano, medical wastes, etc.).
- Air emissions from drycleaners and other industrial sources.
- An assessment of the potential presence of electromagnetic fields (EMF).
- An assessment of any dust generating activities on or near the Site.

The following deviations, data gaps and deletions from ASTM E 1527-13 were necessary in conducting this assessment:

- The Site area history was not conducted in five-year intervals. However, sufficient information about the history of the Site and surrounding area could be obtained from the available historical fire insurance maps, aerial photographs, city directories, and local records and this data gap is not likely to alter the conclusions of this report.

2.4 Limitations and Exceptions

STV has prepared this Phase I ESA using reasonable efforts in each phase of its work to identify RECs associated with hazardous substances, wastes and petroleum products at the Site. The methodology of the Phase I ESA was consistent with the ASTM E 1527-13. Findings within this report are based on information collected from observations made on the day of the Site investigation and from reasonably ascertainable information obtained from governing public agencies and private sources.

This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction

document and should not be used for demolition, renovation, or other construction purposes. STV makes no representation or warranty that the past or current operations at the Site are or have been in compliance with all applicable Federal, State and local laws, regulations and codes.

Regardless of the findings stated in this report, STV is not responsible for consequences or conditions arising from facts that were concealed, withheld, or not fully disclosed at the time the evaluation was conducted.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The regulatory database report provided is based on an evaluation of the data collected and compiled by a contracted data research company. The report focuses on the Site and neighboring properties that could impact the Site. Neighboring properties listed in governmental environmental records are identified within specific search distances. The search distance varies depending upon the particular government record being checked. The regulatory research is designed to meet the requirements of ASTM E 1527-13. The information provided in the regulatory database report is assumed to be correct and complete.

3.0 SITE DESCRIPTION

3.1 Site Location and Legal Description

The Site is located at 165-18 South Road, Jamaica, Queens, New York 11433 (Block 10164, Lots 46, 80, 84, 97, and 103). The Site is comprised of five (5) contiguous lots that total approximately 171,461 square feet (SF). Lot 46 contains an approximately 58,000 SF single story structure constructed in 1939. Lot 80 contains a diesel and heating oil tank vault and pump room building. Lots 84, 97, and 103 are open lots used for parking of buses.

The Site is located in the Jamaica neighborhood of Queens. The Site is not "E" designated according to the New York City Department of City Planning (NYCDCP). A map showing the location of the Site is presented in *Appendix A*. A Site Plan showing the Site's physical layout including adjacent land use is presented in *Appendix B*. Photographs of the Site and surrounding areas are included in *Appendix C*.

The Site is bound to the north by South Road followed by a self-storage facility and a parking lot and subsequently Liberty Avenue; to the east by several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility followed by Merrick Boulevard and subsequently various auto repair facilities and a retail gasoline station; to the south by a mixed-use residential/commercial building and an auto collision repair shop followed by 107th Avenue and subsequently a senior residential living center; and to the west by residential dwellings followed by 165th Street. No changes to the Site were observed since the most recent Sanborn Map (2006).

The surrounding area is primarily characterized by low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR.

According to information obtained through the New York City Department of City Planning (NYCDCP) website, the Site is currently located within zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

3.2 Physical Setting

3.2.1 Topography

According to the United States Geological Survey (USGS) 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, the elevation of the Site is approximately 32 feet above mean sea level (amsl). The topography of the immediate Site area was observed to be sloping to the south-southeast. A copy of the topographic map is presented in *Appendix A*.

3.2.2 Geology

The geology of Queens County can be characterized as a wedge-shaped layer of Cretaceous and Pleistocene unconsolidated sediments, thickening to the south-southeast. Several impermeable clay layers are found within this sediment package, generally creating three distinct aquifers. Consolidated crystalline bedrock is of Precambrian age. The thickness of the unconsolidated sequence ranges from zero to approximately 1,300 feet below ground surface (bgs) from north to south. The southernmost portions of Queens, including portions of the Rockaways, consist of glaciofluvial sediments derived from melt-water of

the retreating glaciers. Depth to bedrock within the vicinity of the Site is at least 600 feet bgs (as per "Ground-Water Resources of Kings and Queens Counties, Long Island, New York, by Herbert Buxton and Peter Schernoff, dated 1999).

3.2.3 Soils

According to the GeoCheck Section of the regulatory agency database report (*Appendix I*), the soil in the area of the Site is described as Urban Land. Urban Land refers to soils that have been altered by human activities thus making them unidentifiable. Typically, these soils have been mixed with other materials, such as brick and concrete (urban fill), and characteristics can only be determined by on-site investigation. Other surficial soil types in the area of the Site consist of silt loam, loamy sand, sandy loam, and fine sandy loam. Sandy loam refers to a soil that's made of sand, silt, and clay.

3.2.4 Hydrology

Generally, groundwater contour lines mimic the surface topography and groundwater flow direction is perpendicular to these contour lines flowing from higher to lower elevation. According to USGS digital elevation data provided by Environmental Data Resources, Inc. (EDR) of Milford, Connecticut (*Appendix I*) and the USGS 7.5-minute Quadrangle map, *Jamaica, NY*, 2013, groundwater in the vicinity of the Site is inferred to flow to the south-southwest towards Jamaica Bay. According to USGS' "Long Island Depth to Water Viewer 2013", depth to groundwater is anticipated to range from approximately 11 to 20 feet bgs. Estimated groundwater levels and/or flow direction(s) may vary due to seasonal fluctuations in precipitation, local usage demands, geology, underground structures, or dewatering operations. The groundwater in the vicinity of the Site is not known to be used for human consumption, as most potable water in the area is derived from upstate reservoirs managed by New York City; the Site area is serviced by the City water supply.

STV did not observe any retention ponds or other surface water bodies on the Site. The nearest surface water body is a pond in Captain Tilly Park, located approximately 4,215 feet north-northwest of the Site. Another pond, Baisley Pond, is located approximately 1.29 miles south of the Site. Bergen Basin, an inlet off Jamaica Bay, is located approximately 2.93 miles south-southwest of the Site.

STV reviewed the United States Fish and Wildlife Service National Wetlands Inventory (NWI) map for the area of the Site (http://www.fws.gov/wetlands/data/index.html) to determine if the Site is located in a regulated wetlands area. Based on a review of the map, the Site is not located within a regulated wetlands area. A copy of the wetlands map is included in *Appendix D*.

The Federal Emergency Management Agency (FEMA) Region II Coastal Analysis and Mapping Preliminary Flood Maps & Data website (http://www.region2coastal.com/view-flood-maps-data/view-preliminary-flood-map-data/) was reviewed to assess whether the Site is located within a designated flood plain or flood zone. According to the revised preliminary FIRM Panel 3604970233G (effective date January 30, 2015), the Site is not located within a 100-year flood zone; therefore, this does not represent an environmental concern for the Site. A copy of the flood insurance map for the Site area is included in *Appendix E*.

Stormwater is collected from catch basins located on paved areas of the Site and the surrounding streets and is conveyed into the NYCDEP combined storm/sanitary sewer system.

3.2.5 Radon

Radon is a colorless, odorless radioactive gas that results from the natural breakdown of uranium minerals in soil, rock, and water, which subsequently enters the atmosphere. It can concentrate in buildings, entering through cracks and other penetrations of a building foundation. Some areas are more likely to have elevated concentrations of radon than others, reflecting subsurface lithologic conditions.

The New York State Department of Health (NYSDOH) maintains a database of radon test results on a local and county level. According to the NYSDOH, 527 radon tests have been conducted in basements in Queens County. The average radon level was found to be 1.24 picoCuries per liter (pCi/L). According to Federal Area Radon Information presented in the EDR report (*Appendix I*), radon concentrations were tested at 81 locations in Queens County. The average radon concentration in Queens County, New York was 0.620 pCi/L in living areas tested and 0.970 pCi/L in basements tested. In addition, Queens County is in United States Environmental Protection Agency (USEPA) Radon Zone 3, where the indoor average radon level is less than 2 pCi/L. These results are below the USEPA Action Level of 4.0 pCi/L; therefore, STV concludes that it is unlikely that elevated levels of radon gas are present at the Site.

4.0 ADJOINING AND SURROUNDING PROPERTIES

The area surrounding the Site is primarily characterized low-rise commercial office and retail buildings, residential properties with commercial first-floor storefronts, residential 1 and 2 family buildings, parking lots, various places of worship, cemeteries, the York College campus, and the Montauk and Ronkonkoma Lines of the LIRR. The following table summarizes the adjoining site uses:

Direction	Facility Name/Description	Street Address/Location	Current Use
North	South Road	NA	Public Street
	Industrial/ Manufacturing	165-08 Liberty Avenue	Storage Warehouse
	Liberty Avenue	NA	Public Street
East	Office Building	103-16 Merrick Blvd.	Office
	Parking	103-34 Merrick Blvd.	Parking
	Industrial/	104-02 Merrick Blvd	Vacant Manufacturing Facility
	Manufacturing	104-10 Merrick Blvd.	Vacant Manufacturing Facility
		104-12 Merrick Blvd.	Vacant Manufacturing Facility
		104-22 Merrick Blvd.	Vacant Manufacturing Facility
		104-28 Merrick Blvd.	Vacant Manufacturing Facility
	Vacant Lot	104-32 Merrick Blvd.	Vacant Land
	Commercial Office	105-02 Merrick Blvd.	Domino's Pizza/Appliance Repair
	Merrick Blvd.	NA	Public Street
	Parking	104-09 Merrick Blvd.	Liberty Motor Cars/Lumara Auto Repair
	Transportation/Utility	104-13 Merrick Blvd.	Rams Auto Repair/Merrick Printing
	Transportation/Utility	104-15 Merrick Blvd.	Sports Line Auto Repairs
	Transportation/Utility	104-19 Merrick Blvd.	Full Line Auto Repairs
	Transportation/Utility	104-21 Merrick Blvd.	Taylors Auto Collision
	Transportation/Utility	105-09 Merrick Blvd.	Inter City Tire (truck tire center)
	Retail Gasoline Sales	105-15 Merrick Blvd.	BP Gas Station
South	Mixed-Use	105-22 Merrick Blvd.	Deli (closed) and Residences
	Transportation /Utility	106-04 Merrick Blvd.	First World Auto/Calvin Auto Body
	107th Avenue	NA	Public Street
	Residential	107-02 Merrick Blvd.	Senior Living - Residential
West	Industrial/ Manufacturing	104-01 165th Street	
	Residential	104-09 to 104-83 165th St.	Residential

Based on our inspection of the adjacent and surrounding properties, the following off-site RECs/VECs were identified:

- Several auto repair facilities are located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- One (1) active gasoline filling station is located in the area surrounding the Site. This property is considered a REC/VEC based on its proximity to the Site.

5.0 HISTORICAL USE RESEARCH

5.1 Land Title Records and Tax Records

STV researched prior ownership information for the Site at the New York City Department of Finance (DOF) website. In addition, prior ownership information was researched through EDR's Environmental Lien Search and the New York City Department of Buildings (NYCDOB) Automated City Register Information System (ACRIS) on-line website. Block 10164, Lot 46 is currently owned by "The City of New York". Based on the research, this entity has owned this property since at least 1947. Block 10164, Lots 80, 84, and 97 are currently owned by "New York City Transit Authority". Based on the research, this entity has owned these properties since at least 1961. Block 10164, Lot 103 is currently owned by "Philip H. Gilsten, acting Treasurer of the City of New York". Based on the research, this entity has owned this property since at least 1955. No environmental liens were identified for the Site. All prior ownership information reviewed is presented in *Appendix J*. The review of current and historical ownership and tax records information revealed that the current and historic use of the Site as bus service station and maintenance garage is considered a REC/VEC.

5.2 Historical USGS Topographic Quadrangles

STV reviewed available historical USGS Topographic Quadrangles for information regarding past uses of the Site and surrounding area. Topographic maps for the Brooklyn quadrangle were obtained for the following years: 1897, 1898, and 1900. Topographic maps for the Jamaica quadrangle were obtained for the following years: 1947, 1957, 1966, 1979, 1994, and 2013. The following table presents descriptions and interpretations from historical USGS topographic map review.

Year (Scale and Quadrangle)	Comments
1897 (1:62,500) Brooklyn	**Site:** The Site appears to be located amongst developed streets. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** Surrounding properties appear to be located amongst developed streets. The Long Island Railroad (LIRR) tracks are depicted to the north of the Site. A pond is depicted west-southwest of the Site on the south side of the LIRR tracks. The area a few blocks south of the Site appears as undeveloped land with only a few roadways present, rail lines, and a pond and wetlands area. Due to scale of the map, no further information can be obtained.
1898 (1:62,500) Brooklyn	**Site:** No significant changes are apparent to the Site property from the 1897 topographic map. **Surrounding Properties:** No significant changes are apparent to the adjacent and surrounding properties from the 1897 topographic map.
1900 (1:62,500) Brooklyn	**Site:** No significant changes are apparent to the Site property from the 1898 topographic map. **Surrounding Properties:** No significant changes are apparent to the adjacent and surrounding properties from the 1898 topographic map.

Year (Scale and Quadrangle)	Comments
1947 (1:25,000) Jamaica	**Site:** The Site is shown with one long structure fronting 165th Street and one small structure fronting Merrick Boulevard. Two other small structures are located on the Site. Due to scale of the map, no further information can be obtained. **Surrounding Properties:** The areas north, east, south, and west of the Site have been significantly developed with streets and structures. Several buildings are depicted directly east of the Site on the same block. Prospect Cemetery is identified west of the Site on the south side of the LIRR tracks where a pond was previously depicted. The Jamaica Station is located west-northwest of the Site. Water Supply Company Tank No. 2 is located east of the Site. Baisleys Pond is depicted several blocks south of the Site. The Contagious Disease Hospital and Queens General Hospital are located northwest of the Site on the south side of Union Turnpike.
1957 (1:24,000) Jamaica	**Site:** Elevation contour lines are depicted on the map and show the Site is approximately 30 feet amsl. One (1) large structure is depicted on the Site. The small structure fronting Merrick Boulevard and the other two (2) small structures are no longer depicted. No other significant changes are apparent to the Site property from the 1947 topographic map. **Surrounding Properties:** An Armory is identified several blocks north of the Site on the north side of the LIRR tracks. Water pumping stations are located east and south of the Site. A water tower is depicted west of Site in the immediate vicinity of Prospect Cemetery. The LIRR Hillside Support Facility is depicted to the east of the Site. St. Albans Naval Hospital is located southeast of the Site. No other significant changes are apparent to the surrounding properties from the 1947 topographic map.
1966 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1957 topographic map. **Surrounding Properties:** P.S. 116 is located to the east of the Site. J.H.S. 8 is located to the south of the Site. No other significant changes are apparent to the adjacent and surrounding properties from the 1957 topographic map.
1979 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1966 topographic map. **Surrounding Properties:** No significant changes are apparent to the adjacent and surrounding properties from the 1966 topographic map except the water tower that was west of Site near Prospect Cemetery is no longer depicted.
1994 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1979 topographic map. **Surrounding Properties:** No significant changes are apparent to the adjacent and surrounding properties from the 1979 topographic map.
2013 (1:24,000) Jamaica	**Site:** No significant changes are apparent to the Site property from the 1979 topographic map. **Surrounding Properties:** No significant changes are apparent to the adjacent and surrounding properties from the 1979 topographic map.

Based on STV's review of historical topographic maps, the Site appears to be amongst developed streets as early as 1900. No evidence of filling was noted on the Site property. The Site property was previously developed with at least three other structures. Potential buried structures from former buildings on the Site property could contain a UST and/or historic fill materials of unknown origin, and is considered a REC/VEC with respect to the Site. The Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site. The review of historical USGS Topographic Quadrangles did not indicate RECs, CRECs, HRECs, or VECs at the surrounding areas. Copies of historical USGS Topographic Maps are included in *Appendix F*.

5.3 Historical Aerial Photographs

STV reviewed historical aerial photographs of the Site and surrounding areas provided by EDR in order to identify historical land use that may have involved hazardous substances and petroleum products. Aerial photographs were obtained for the following years: 1951, 1954, 1961, 1966, 1975, 1994, 2006, 2009, and 2011. The following table summarizes descriptions and interpretations from the historical aerial photograph reviews:

Year	Comments
1951 1" – 500'	**Site:** The Site appears to be developed with a large structure in the northern portion and several smaller structures in the southern and eastern portions. The southern end of the Site appears to be used for parking. Due to the scale of the photograph, no further details can be discerned. **Surrounding Properties:** The areas adjacent to the Site to the east and west appear to be developed with multiple structures. The area north of the Site appears as a building with parking on the roof. Railroad tracks are depicted to the north. A large water tank is located south of the Site. Due to scale of the photograph, no further details can be discerned.
1954 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1951 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 1951 aerial photograph.
1961 1" – 500'	**Site:** The structures in the southern and eastern portions of the Site are no longer visible. Several buses appear to be parked in the eastern portion of the Site. No other significant changes are discernible on the Site from the 1954 aerial photograph. **Surrounding Properties:** Two water tanks are located south of the Site. No other significant changes are discernible to the adjacent and surrounding properties from the 1954 aerial photograph.
1966 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1961 aerial photograph. **Surrounding Properties:** A structure east of the Site on the same block is gone and the area appears to be used as storage for truck trailers or cargo containers. No other significant changes are discernible to the adjacent and surrounding properties from the 1961 aerial photograph.
1975 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1966 aerial photograph. **Surrounding Properties:** Several structures east of the Site on the same block are gone and two (2) structures appear to have been developed in this area. Several blocks to the west-northwest of the Site now appear as vacant lots. No other significant changes are discernible to the adjacent and surrounding properties from the 1966 aerial photograph.
1994 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1975 aerial photograph. The image is of poor quality. **Surrounding Properties:** The properties to the east of the Site on the same block appear to have been developed with large contiguous structures. The structures on the block south of the Site's block are gone and the area appears to be vacant. Several large structures surrounded by open landscaped areas have been developed to the west-northwest of the Site (York College campus). No other significant changes are discernible to the adjacent and surrounding properties from the 1975 aerial photograph. The image is of poor quality.
2006 1" – 500'	**Site:** No significant changes are discernible on the Site from the 1994 aerial photograph. **Surrounding Properties:** A large building complex has been constructed on the block south of the Site's block. No other significant changes are discernible to the adjacent and surrounding properties from the 1994 aerial photograph.
2009 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2006 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent and surrounding properties from the 2006 aerial photograph.
2011 1" – 500'	**Site:** No significant changes are discernible on the Site from the 2009 aerial photograph. **Surrounding Properties:** No significant changes are discernible to the adjacent properties from the 2009 aerial photograph.

The review of historical aerial photographs revealed the presence of the following RECs and VECs at the Site:

- The Site property was previously developed with a several structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

The review of historical aerial photographs did not indicate RECs, CRECs, HRECs, or VECs at the surrounding areas. Copies of reproducible historical aerial photographs are included in *Appendix G*.

5.4 Historical Fire Insurance Maps (Sanborn® Maps)

A search for historical fire insurance maps for the Site and adjoining properties was conducted by EDR. These maps were obtained for the following years: 1891, 1897, 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006. The following table presents descriptions and interpretations from historical fire insurance map review.

Year	Comments
1891	**Site:** The Site is identified as being a part of 'Lot 43'. The Site is vacant except for a shed in the northwestern portion. **Surrounding Properties:** South Street is identified to the north of the Site. Locust Street is identified to the northwest of the Site. Properties to the northeast and northwest include residential dwellings and sheds.
1897	**Site:** The Site is depicted as mostly vacant land. The western edges of three (3) properties along Merrick Road are depicted as being on the Site. An access road or path originating in South Street traverses the northeastern portion of the Site behind (on the western side) the three properties. No other significant changes have occurred to the Site from the 1891 map. **Surrounding Properties:** Properties to the northeast include a polling place and residential dwellings; to the east a wheel right and a few residential dwellings; and to the northwest residential dwellings, a horse shed, and a hotel. No other significant changes have occurred to the adjacent and surrounding properties from the 1891 map.
1901	**Site:** The Site is depicted as a portion of one large lot plus three lots fronting Merrick Plank Road and a portion of a fourth lot fronting Merrick Plank Road. The Site is depicted as mostly vacant land with a shed in the northwestern portion and three (3) residential dwellings and a shed in the southeastern portion. The road or path that traversed the northeastern portion of the Site is no longer depicted. No other significant changes have occurred to the Site from the 1897 map. **Surrounding Properties:** Surrounding properties include residential dwellings, sheds, a hotel, a polling place, a **blacksmith,** and a **sign painting shop**. Highview Street is depicted to the west of the Site. Merrick Road is now identified as Merrick Plank Road. No other significant changes have occurred to the adjacent and surrounding properties from the 1897 map.
1912	**Site:** The Site is depicted as one (1) large lot (Lot 1199) plus three (3) lots fronting Merrick Road, five (5) lots fronting Sampson Avenue and a portion of a 6th lot fronting Sampson Avenue and two vacant lots. A residential dwelling with a wood shed, a wagon shed, and two structures with storefronts are depicted on the lots fronting Merrick Road. Five (5) residential dwelling are depicted on the lots fronting Sampson Street. No other significant changes have occurred to the Site from the 1901 map. **Surrounding Properties:** Several more residential dwellings and streets have been developed in the areas north, east, south, and west of the Site. The **sign painting shop** is no longer depicted to the east of the Site across Merrick Blvd. No other significant changes have occurred to the adjacent and surrounding properties from the 1901 map.

Year	Comments
1926	**Site:** The Site is depicted with another shed in the southeastern portion. No other significant changes have occurred to the Site from the 1912 map. **Surrounding Properties:** Several residential dwellings have been developed on the blocks northeast, south, and west of the Site. An **auto painting facility** is located to the east of the Site across Merrick Blvd. and a **sign painting shop** is located to the northeast of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1912 map.
1951	**Site:** The northern portion of the Site has been developed with a large structure identified as the **New York City Transit System Service Station and Garage**. The residential dwelling and wood shed that were on one of the lots fronting Merrick Road are no longer depicted and the lots is now developed with a woodworking building, a storefront, and two lumber sheds. The two structures with storefronts that were fronting Merrick Road are no longer depicted and there is a **gasoline filling station with four (4) tanks**. No other significant changes have occurred to the Site from the 1926 map. **Surrounding Properties:** Two **iron works**, two **auto repair facilities**, a **lacquer paint shop**, and two **gasoline filling stations** are located to the east of the Site on the same block. An **auto body repair shop** and a **gasoline filling station** are located to the east of the Site across Merrick Blvd. An upholsterer is located southeast of the Site on the same block. A **carpet cleaner** is located to the southeast of the Site. No other significant changes have occurred to the adjacent and surrounding properties from the 1926 map.
1981	**Site:** The woodworking building, storefront and sheds, and the **gasoline filling station** fronting Merrick Boulevard (formerly Merrick Road) and the five (5) residential dwellings and sheds fronting 107th Avenue (formerly Sampson Avenue) are no longer depicted and the area is labeled 'parking'. No other significant changes have occurred to the Site from the 1951 map. **Surrounding Properties:** Buildings labeled '**salvage depot**', '**auto parts mfg**', and '**paints**' are located immediately adjacent to the Site to the east. A **print shop**, two **auto repair facilities,** a **tire service**, and a **gasoline filling station** are located to the east of the Site across Merrick Boulevard. A **truck repair shop** and a **gasoline filling station** are located to the southeast of the Site. The two **gasoline filling stations** to the east of the Site on the same block are no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1951 map.
1982	**Site:** No significant changes have occurred to the Site from the 1981 map. **Surrounding Properties:** The **carpet cleaner** located to the southeast of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1981 map.
1986	**Site:** No significant changes have occurred to the Site from the 1982 map. **Surrounding Properties**: A **junk yard** is depicted to the east of the Site along 106th Avenue. No other significant changes have occurred to the adjacent and surrounding properties from the 1982 map.
1988-1993	**Site:** No significant changes have occurred to the Site from the 1986 map. **Surrounding Properties**: The **junk yard** is no longer depicted beginning in 1991. An **auto repair facility** is depicted at the southeast corner of Merrick Blvd. and 104th Avenue beginning in 1993. No other significant changes have occurred to the adjacent and surrounding properties from the 1986 map.
1995	**Site:** No significant changes have occurred to the Site from the 1993 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1993 map.
1996	**Site:** No significant changes have occurred to the Site from the 1995 map. **Surrounding Properties:** An **auto repair and wash facility** is depicted to the east of the Site on the same block. An **auto repair facility** located east of the Site on the same block (at the north end) is no longer depicted. No significant changes have occurred to the adjacent and surrounding properties from the 1995 map.

Year	Comments
1999	**Site:** No significant changes have occurred to the Site from the 1996 map. **Surrounding Properties:** The building immediately adjacent to the Site to the east is no longer labeled '**paints**'. The **gasoline filling station** located to the east of the Site is no longer depicted. No other significant changes have occurred to the adjacent and surrounding properties from the 1996 map.
2001-2006	**Site:** No significant changes have occurred to the Site from the 1999 map. **Surrounding Properties:** No significant changes have occurred to the adjacent and surrounding properties from the 1999 map.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the Site:

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The historic use of a portion of the Site as a gasoline filling station is considered a REC/VEC.

- The current and historic use of the Site as a bus service station and maintenance garage is considered a REC/VEC.

The review of Sanborn Maps revealed the presence of the following RECs and VECs at the surrounding areas:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Several current auto repair facilities and one retail gasoline filling station were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

Copies of the historical fire insurance maps are provided in *Appendix H*.

5.5 City Directories

A review of historical city directories for the Site and surrounding areas was conducted by EDR. The following table presents descriptions and interpretations from the historical city directory reviews.

Year	Comments
1922	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
1934	**Site:** The Site address was listed with residential listings. **Surrounding Properties:** Surrounding properties included residential listings, a **printer**, a plumbing and heating supply corp., and an **auto body shop**.
1939	**Site:** The Site address was listed with a **gasoline service station** (105-14 Merrick Blvd.). **Surrounding Properties:** Surrounding properties included residential listings, and a plumbing and heating supply corp.

Year	Comments
1945	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings**, gasoline service station**, **home oil service,** and **auto repair shops**.
1950	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a glass company, a **paint shop**, a nursing home, offices, **auto repair shops, gasoline service station, home oil service,** pharmacy, and a liquor store.
1962	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a delicatessen and grocery, a plumbing and heating supply corp., and **auto repair shops**.
1967	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a delicatessen and grocery, **auto repair shop,** and a **gasoline service station**.
1970	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a grocery store, **auto body shops**, a plumbing and heating supply corp., and **auto repair shops**.
1976	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a grocery store, a **gasoline service station**, and **auto body shops**.
1983	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a grocery store, furniture store, a **gasoline service station**, and **auto body shops**.
1991	**Site:** The Site address was listed with Amalgamated Transit Union. **Surrounding Properties:** Surrounding properties included residential listings, a grocery store, and **auto body shops**.
1996	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, and a training and counseling school.
2000	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings.
2005	**Site:** The Site address was listed with Amalgamated Transit Union and Sprague Energy. **Surrounding Properties:** Surrounding properties included residential listings, a construction company, and **auto body shops**.
2008	**Site:** The Site address was listed with New York City Transit Authority. **Surrounding Properties:** Surrounding properties included residential listings, an event planner, and a cosmetics store.
2013	**Site:** The Site address was not listed. **Surrounding Properties:** Surrounding properties included residential listings, a heating corp., fast food establishments, **auto body shops,** and **auto repair shops**.

The review of the historical city directories revealed the presence of the following RECs and VECs at the Site and surrounding areas:

- The historic use of a portion of the Site as a gasoline filling station is considered a REC/VEC.

- The current and historical use of the adjacent and surrounding properties included a paint shop, auto body and auto repair shops, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

Copies of the historical city directories are provided in *Appendix J.*

5.6 Prior Reports

STV reviewed a *Phase I ESA for Eight Properties Near Jamaica Bus Depot*, dated February 17, 2012. The report was prepared by STV on behalf of MTA NYCT. The properties are located in the Borough of Queens, New York, including Lots 41, 53, 60, 61, 63, 66, 68, and 72 within Block 10164. The Phase I ESA identified RECs in connection with the properties addressed as 103-16 Merrick Boulevard and 103-30 Merrick Boulevard. These properties historically including an auto repair shop and filling stations with gasoline storage tanks. Additionally, an existing product plume at the Site and adjacent properties is considered a REC. Finally, based on open spills, undocumented tightness testing and known subsurface contamination, the Jamaica Bus Depot and BP Service Station #11009 represent RECs. The Phase I ESA revealed environmental concerns associated with the Site including suspect ACM, LBP on interior and exterior painted surfaces, suspect PCBs, and water staining and mold growth.

The report concluded that NYCT has performed extensive soil and groundwater investigations, including post-remediation sampling, at the Jamaica Bus Depot from approximately 2002 to the present. Based on the ongoing environmental monitoring being administered under NYSDEC Global Consent Order, active pump and treat remediation system, and numerous sub-surface environmental investigations that have been performed at the Jamaica Bus Depot, a Phase II Environmental Site Investigation (ESI) was not required. Based on the review of this existing information, recommendations were provided for engineering controls to be implemented during future site development. At a minimum, the following remedial actions and/or engineering controls are required to render the Site suitable for use:

1. Prior to any site redevelopment, a geophysical survey should be performed to determine if any underground storage tanks (USTs) are present at 103-16 Merrick Boulevard, 103-30 Merrick Boulevard and any other potential excavation locations. Additionally, in the event that a UST is discovered, an evaluation should be made at that time of the need for any additional investigation to determine whether soil and/or groundwater has been adversely impacted more than is currently documented.
2. As a safeguard to prevent potential volatile organic compounds in soil vapor from entering the new building in the future, a soil vapor barrier should be integrated into the new building design.
3. All material excavated during construction activities should be properly characterized and disposed, including collection and analysis of additional samples if required by the contractor-selected disposal facilities.
4. After the proposed new building and grounds are constructed, any exposed soil (landscaped areas) must be covered with at least two feet of environmentally clean fill.
5. Suspect ACM, LBP, PCB-containing materials and/or mold encountered during construction or excavation should be properly identified and managed.

5.7 Other Historical Sources

In 2012, STV was provided with several previous environmental reports pertaining to the NYCT Jamaica Depot located at 165-18 South Road, Jamaica, Queens, NY. URS Corporation (URS) is currently providing environmental engineering services for the Jamaica Bus Depot in conjunction with NYCT's UST program. The work is being administered under NYSDEC Global Consent Order CO2-20000101-3341 dated May 2001. NYCT has been operating a pump and treat remediation system to recover a combined heating oil and diesel fuel release since 1995 at the Jamaica Bus Depot. NYSDEC spill #9010039 was initially reported on December 14, 1990 and continues to be an open case, along with several other spills that occurred consequently. Numerous investigations have been performed at the

Jamaica Bus Depot by URS to evaluate the extent of product in the sub-surface and all possible in-situ remedial measures to address petroleum-impacted soil and groundwater. These are as follows:

- Soil Investigation Report, October 2002. This investigation consisted of the advancement of five soil borings within the plume and collecting soil samples to determine the presence and vertical extent of petroleum-impacted soil beneath the water table. This study was prompted by NYCDEP's intention to re-activate the Jamaica Water Supply wells for regional dewatering in 2007 which could lower the water table by as much as 16 feet. The study concluded that product releases likely occurred when the water table was depressed during the previous operation of the Jamaica water supply system (pre-1996). However, soil impacts when compared with cleanup objectives were insignificant.
- Site-Specific Investigation Work Plan (SSIWP), May 2004. A soil and groundwater investigation was conducted in 2003 to determine the levels to which product had impacted soils relative to NYSDEC TAGM soil cleanup objectives, the results of which were reported in this SSIWP. Six borings were advanced with soil samples and groundwater samples were collected from nearby wells. The results imply that free product and the associated petroleum contaminants detected in soils were not significantly impacting dissolved-phase groundwater quality. The SSWIP also discussed the feasibility of bioremediation at the Jamaica Depot.
- Feasibility of Enhanced Product Recovery through Site-Wide Groundwater Depression, May 2004. This feasibility study (FS) was prompted by NYSDEC correspondence to URS dated April 29, 2004 that suggested that the product recovery system be enhanced or redesigned to increase product recovery through a significant increase in the pumping rate to overcome the rise in groundwater levels. The FS consists of dewatering calculations to determine the capacity of a remediation system capable of lowering the water table in the depot area by five feet. The pumping rate was estimated on the higher end of the range from 400 to 4,000 gpm, based on operating data from the existing system. The FS also stated that the product plume was currently trapped beneath the water table but was stable and not migrating.
- Site-Specific Remedial Plan (SSRP) for In-Situ Bioremediation Investigation, October 2004. In-situ enhanced bioremediation was recommended as the only feasible technology for soil remediation, considering the site constraints. Implementation would be done through the injection of a slurry of oxygen-releasing material in the subsurface. An investigation was performed in June 2004 to support this recommendation and thus acquire site-specific information pertaining to existing microbiologic conditions within and outside of the historic limits of the free product plume. Two borings were advanced (GP-7 and GP-8) near existing monitoring wells (W-10 and W-25) and samples were collected for both, respectively.
- Site-Specific Remedial Plan and Remedial Design (SSRP/RD) for Enhancing Product Recovery, March 2005. The SSRP/RD was designed to address the fact that effective in-situ technologies to treat trapped product are limited. At a meeting with NYSDEC and NYCT on February 25, 2005, one potential approach was identified utilizing the full capacity of a single extraction well for recovery in of product in that area. The SSRP/RD was approved in a letter dated May 5, 2005 by the NYSDEC for the use of one well (PW-4) to pump 170 gallons per minute (gpm) in order to lower the water table by four feet in an area extending 20-25 feet from the extraction point. If the design is successful, it will be utilized at a later date to address the rest of the plume.
- Remediation Analytical Data, 2008-2011. Groundwater quality is being monitored during remediation at the Jamaica Depot, as well as groundwater and product levels.

5.8 Historical Use Interviews

No other historical sources were available for interview.

6.0 REGULATORY AGENCY RECORD REVIEWS

The databases discussed in this section, provided by EDR, were reviewed for information regarding documented and/or suspected releases of regulated hazardous substances and/or petroleum products on or near the Site (*Appendix I*). STV also reviewed the "unmappable" (also referred to as "orphan") listings within the database report, cross-referencing available address information and facility names. Unmappable sites are listings that cannot be plotted with confidence, but are identified as being located within the general area of the Site based on the partial street address, city name, or zip code. In general, a listing cannot be mapped due to inaccurate or incomplete address information in the database that was supplied by the corresponding regulatory agency. Any listings from the unmappable summary which were identified by STV as a result of the area reconnaissance and/or cross-referencing to mapped listings are included in the corresponding database discussion within this section.

6.1 Federal and State Regulatory Agency Database Reviews

A review of federal and state records for the Site was accomplished by contacting offices of Federal and State regulatory agencies and review of the regulatory listings compiled in the regulatory agency database report (*Appendix I*). The results of the review of the Federal and State records are presented below. Copies of the correspondences are included in *Appendix K*.

United States Environmental Protection Agency (USEPA)
The USEPA is responsible for protecting human health and the environment. To that end, the USEPA develops and enforces regulations that implement environmental laws enacted by Congress. A Freedom of Information Law (FOIL) request dated August 22, 2016 was filed with the USEPA to determine if the agency holds additional records pertaining to the Site property. USEPA acknowledged the request on October 1, 2015. At the time this report was issued, STV had not yet received any further responses from USEPA. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

The status of the Site was also checked on USEPA's MyPropertyInfo website on September 30, 2015. A search of the databases did not locate any environmental records. A copy of the MyPropertyInfo result is included in *Appendix K*.

New York State Department of Environmental Conservation (NYSDEC)
The NYSDEC maintains files of incidents involving environmentally regulated materials, spill incidents, and state regulated cleanups. The records maintained by NYSDEC include reports of spills of hazardous chemicals and petroleum, petroleum bulk storage information, and site-specific environmental data. NYSDEC information concerning the Site property was requested in a FOIL records access application dated August 22, 2016. NYSDEC acknowledged the request on August 22, 2016. At the time this report was issued, STV had not yet received any further responses from NYSDEC. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York State Department of Health (NYSDOH)
The NYSDOH Records Access Office maintains files of health-related environmental incidents in the State of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYSDOH information concerning the Site property was requested in a formal letter dated August 22, 2016. NYSDOH acknowledged the request on August 22, 2016. At the time this report was issued, STV had not yet received any further responses from NYSDOH. Upon receipt of this information, STV will review the response and, if

conclusions contained within this report are affected, will submit an addendum to this report.

A summary of sites identified through the Federal and State regulatory agency database review is provided in the following table:

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
National Priorities List for Federal Superfund Cleanup (NPL)	03/07/2016	1 mile	0	No	No
Delisted NPL Site List	03/07/2016	1 mile	0	No	No
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), including CERCLIS NFRAP Sites	03/07/2016	½ mile	0/0	No	No
Resource Conservation and Recovery Information System – Corrective Action Activity (RCRIS CORRACTS) and Non-CORRACTS Treatment, Storage, or Disposal Facilities (RCRIS-TSD)	12/09/2015	1 mile / ½ mile	0/0	No	No
Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)	12/09/2015	¼ mile	4/4/3	Yes	**Yes**
RCRA Non-Generator	12/09/2015	¼ mile	42	No	**Yes**
Federal Institutional Control/Engineering Control Registries	09/10/2015	½ mile	0/0	No	No
Emergency Response Notification System (ERNS)	03/28/2016	Site	NA[1]	No	No
State Toxic Release Inventory System (TRIS)	12/31/2014	¼ mile	0	No	No
Hazardous Substance Waste Disposal Site Inventory (HSWDS)	01/01/2003	½ mile	0	No	No
New York State Inactive Hazardous Waste Disposal Sites (SHWS)	05/17/2016	1 mile	3	No	No
Solid Waste Management Facilities Sites (SWF/LF)	04/06/2016	½ mile	17	No	**Yes**
Vapor Reopened	08/01/2015	1 mile	1	No	No
New York State Spills Information (NY Spills)/Leaking Underground Storage Tanks (LTANKS)	05/17/2016	½ mile 1/8 mile	25/41	**Yes**	**Yes**
Petroleum Bulk Storage Tanks (USTs/ASTs)	03/29/2016	¼ mile	11/21	**Yes**	**Yes**
NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)	01/01/2002	¼ mile	0/1	**Yes**	**Yes**
NY Chemical Bulk Storage Tanks (NY CBS)	03/29/2016	¼ mile	2	**Yes**	**Yes**
Historic Bulk Storage Tanks (USTs/ASTs)	01/01/2002	¼ mile / Site	5/0	No	**Yes**
Integrated Compliance Information System (ICIS)	01/23/2015	Site	1	**Yes**	No

Federal and State List	Last Updated	Search Radius*	No. of Sites within Search Radius	Site Appears on List	RECs, CRECs, or VECs Identified
Facility Index / Registry System (FINDS)	07/20/2015	Site	2	**Yes**	No
Enforcement & Compliance History Information (ECHO)	09/20/2015	Site	2	**Yes**	No
New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)	05/17/2016	1 mile	0/1	No	No
E-Designation Site (E)	03/14/2016	1/8 mile	54	**Yes**	**Yes**
Registered Dry Cleaners	03/25/2016	½ mile	0	No	No
EDR US Hist Auto Stat	NA	¼ mile	26	No	**Yes**
EDR US Hist Cleaners	NA	½ mile	1	No	**Yes**
NY Manifest	05/01/2016	¼ mile	76	**Yes**	**Yes**
NJ Manifest	12/31/2013	¼ mile	8	**Yes**	**Yes**
RI Manifest	12/31/2013	¼ mile	1	**Yes**	**Yes**
NY SWRCY	04/06/2016	½ mile	1	No	No
Air Emissions Data (US AIRS)	10/20/2015	Site	1	**Yes**	No
Manufactured Gas Plant Sites (Coal Gas)	NA[2]	1 mile	1	No	No

* The surrounding area search radius indicates the radial area (measured from the perimeter of the Site) for which the database review was performed.
[1]NA – Not Applicable
[2] This database consists of a compilation of historic resources (as early as the late 1800s) prepared by EDR that does not require updates. The last MGP in New York State ceased operations in 1972.

The Site is listed in the RCRA-CESQG, US AIRS, NY Manifest, NJ Manifest, RI Manifest, ICIS, FINDS, ECHO, NY LTANKS, NY Spills, NY CBS, NY AST, NY CBS AST, and NY UST databases. The following subsections provide a discussion of the listings that have been identified within the search radii and are in the table above:

National Priorities List of Federal Superfund Cleanup (NPL)
The NPL is a subset of the CERCLIS, and lists properties that are ranked as high priority for cleanup under the federal Superfund program. Neither the Site nor any other facility within one mile of the Site is listed in the NPL Site List.

Delisted NPL Site List
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the USEPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425 (e), sites where no further response is appropriate may be deleted from the NPL. Neither the Site nor any other facility within one mile of the Site is listed in the Delisted NPL Site List.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
The CERCLIS list is a compilation of known and suspected uncontrolled or abandoned hazardous waste sites which are, or were, under investigation by USEPA but have not been elevated to the status of a Superfund (NPL) site. Former CERCLIS sites that have been granted the status of No Further Remedial Action Planned (NFRAP) are also included in the database. Neither the Site nor any other facility within one-half mile of the Site is listed in the CERCLIS or CERCLIs NFRAP databases.

Resource Conservation and Recovery Information System (RCRIS) – Treatment, Storage, or Disposal Facilities (TSD) and RCRIS Corrective Action Activity (CORRACTS)

The RCRA program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRIS database tracks facilities that treat, store, and/or dispose of hazardous waste as defined by RCRA (referred to as TSD facilities). The RCRIS CORRACTS database identifies TSD facilities that have conducted, or are currently conducting, corrective action(s) as regulated under RCRA.

Neither the Site nor any other facility within one mile of the Site is listed in the RCRIS CORRACTS database and neither the Site nor any other facility within one-half mile of the Site is listed in the RCRIS-TSD database.

Resource Conservation and Recovery Information System Generators/Transporters (RCRIS Gen/Trans)

This list includes operations that generate or transport hazardous waste for which a hazardous waste generator identification number or transporter permit is required. The RCRIS Gen/Trans listing is merely a listing of all facilities that, due to the amount of hazardous waste generated, are required to register with the USEPA for tracking purposes, but are not necessarily those with reported contamination incidents.
The Site was listed in the RCRIS Gen/Trans database as a RCRA Conditionally Exempt Small Quantity Generators (RCRA-CESQG). This listing is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
NYCTA 165-18 South Road Jamaica, NY 11433	Target Property	NA	A1	EPA ID: NYD980642268. The Site is also listed on the US AIRS, NJ Manifest, and RI Manifest databases. Facility generates cadmium, lead, and waste oils and has listed violations associated with its operations.

Four (4) RCRA Large Quantity Generator (RCRA-LQG) was listed within a one-quarter mile radius of the Site. Based on their respective distances from the Site and lack of reported violations, these RCRA-LQG listings are not anticipated to have affected the environmental integrity of the Site.

Four (4) RCRA Small Quantity Generators (RCRA-SQG) were listed within a one-quarter mile radius of the Site. Based on their respective distances from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow directions, these RCRA-SQG listings are not anticipated to have affected the environmental integrity of the Site.

Two (2) other RCRA-CESQG facilities were listed within a one-quarter mile radius of the Site. Based on their distance from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow direction, these RCRA-CESQG listings are not anticipated to have affected the environmental integrity of the Site.

Resource Conservation and Recovery Information System Non-Generators / No Longer Reporting (RCRA NonGen / NLR)

RCRAInfo is USEPA's comprehensive information system, providing access to data supporting the RCRA of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous

waste as defined by the RCRA. Non-Generators do not presently generate hazardous waste. The Site is not listed in the RCRA NonGen / NLR database.

Forty-two (42) RCRA NonGen / NLR facilities were identified within a one-quarter mile radius of the Site. The following RCRA NonGen / NLR facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	229-ft/North-northwest	Cross-gradient	B73	EPA ID: NYD986903763. The Site is also listed on the NY Manifest database. The facility is a retail gasoline filling station.
Liberty Ashes Inc. 94-24 Merrick Blvd. Jamaica, NY 11433	588-ft/North-northwest	Cross-gradient	L145	EPA ID: NYD987031143. The Site is also listed on the US AIRS database. The facility generates ignitable waste, corrosive waste, reactive waste, arsenic, barium, cadmium, lead, mercury, spent non-halogenated solvents, parathion, and waste oils.
Jamaica Recycling Inc. 94-29 165th Street Jamaica, NY 11433	618-ft/Northwest	Cross-gradient	O157	EPA ID: NYN008011702. The facility has received violations.
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	20-ft/East	Up-gradient	D22	EPA ID: NYD987030012. The Site is also listed on the NY Manifest database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	339-ft/East-southeast	Cross-gradient	G95	EPA ID: NYD981874407. The Site is also listed on the NY Manifest database.

None of the other RCRA Non/Gen /NLR listings are anticipated to have affected the environmental integrity of the Site, based on their distances from the Site, lack of reported violations, and/or inferred down-gradient groundwater flow directions.

Federal Institutional Control/Engineering Control Registries

The Federal Institutional Control/Engineering Control Registries are listings of sites with engineering controls and/or institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining at a site. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or affect human health. Neither the

Site nor any other facility within one-half mile of the Site is listed in the Federal Institutional Control/Engineering Control Registries.

Emergency Response Notification System (ERNS)
The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances. The Site is not listed in the ERNS database.

New York State Toxic Release Inventory System (TRIS)
The Toxic Release Inventory System (TRIS) is a database used to collect information and report releases of toxic chemicals to the air, water, and land in reportable quantities. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the TRIS database.

Hazardous Substance Waste Disposal Site Inventory (HSWDS)
The list includes any known or suspected hazardous substance waste disposal sites. Also included are sites delisted from the Registry of Inactive Hazardous Waste Disposal Sites and non-Registry sites that USEPA Preliminary Assessment (PA) reports or Site Investigation (SI) reports were prepared. Hazardous Substance Waste Disposal Sites are eligible to be Superfund sites. The sites on the list will not automatically be made Superfund sites; rather each site will be further evaluated for listing on the Registry. Neither the Site nor any other facility within one-half mile of the Site is listed in the HSWDS database.

New York State Inactive Hazardous Waste Disposal Sites (SHWS)
The New York State Inactive Hazardous Waste Disposal Sites database, compiled by the NYSDEC, maintains information regarding the investigation and cleanup of suspected hazardous waste sites. The Site is not listed in the SHWS database.

Three (3) SHWS facilities were listed within a one-mile radius of the Site. Based on their distances from the Site (greater than one-quarter mile) and/or inferred down-gradient groundwater flow direction, these SHWS facilities are not anticipated to have affected the environmental integrity of the Site.

Solid Waste Management Facilities Sites (SWF/LF)
The SWF/LF database is a comprehensive listing of State permitted/recorded solid waste management facilities. The Site is not listed in the SWMF database.

Seventeen (17) SWF/LF facilities were listed within a one-half mile radius of the Site. The following SWF/LF facilities have the potential to impact the environmental integrity of the Site and are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Taylor Auto Collision 104-21 Merrick Blvd. Jamaica, NY 11433	225-ft/North-northeast	Up-gradient	E71	The Site was engaged in vehicle dismantling. The Site is inactive.
S&S Super Sports Auto Care Inc. 94-40 Merrick Blvd. Jamaica, NY 11433	447-ft/North-northwest	Cross-gradient	F112	The Site was engaged in vehicle dismantling. The Site is inactive.
Jamaica Recycling Inc. 94-29 165th Street Jamaica, NY 11433	618-ft/Northwest	Cross-gradient	O156	EPA ID: NYN008011702. The facility is a transfer station.

Based on their distances from the Site and/or inferred down-gradient groundwater flow direction, the other SWF/LF facilities are not anticipated to have affected the environmental integrity of the Site.

Vapor Reopened

New York is currently re-evaluating previous assumptions and decisions regarding the potential for soil vapor intrusion exposures at sites. As a result, all past, current, and future contaminated sites will be evaluated to determine whether these sites have the potential for exposures related to soil vapor intrusion. The Site is not listed in the Vapor Reopened database.

One Vapor Reopened facility was listed within a one-mile radius of the Site. The facility is identified as West Side Corp., and is located 3,330-ft east of the Site at 107-10 180th Street. This facility is also listed in the NY UST and Historical UST databases. The site contains soil vapor and contaminated groundwater above guidance values. Based on its distance from the Site and/or inferred down-gradient groundwater flow direction, this Vapor Reopened listing is not anticipated to have affected the environmental integrity of the Site.

New York State Spills Information Database (NY Spills)/Leaking Underground Storage Tanks (LTANKS)

The NY Spills database, including LTANKS sites, was researched to identify listings within one-half mile of the Site. The database search identified 25 reported NY Spills and 41 LTANKS incidents within one-half mile of the Site. The Site is listed in the NY Spills/LTANKs databases under multiple spill numbers that have been closed (LTANKS Spill Nos. 0209676 and 9515067; NY Spills Spill Nos. 0911344, 0103942, 9904615, 9710871, 9702423, 0711185, 9913012, 9106191, 9309149, 9213534, 9300925, 9412938, 9413672, and 9307180).

The Site is listed in the LTANKS database for an open spill (Spill No. 9010039) that is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	Target Property	NA	A3	Spill No. 9010039 was reported on 12/14/90. The spill was the result of a tank test failure. The spill is not closed. There are known petroleum-impacted soils and groundwater. NYCT has been operating a pump and treat system since 1995.

The following other NY Spills/LTANKS facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Citgo Gas Station 105-15 Merrick Blvd. Jamaica, NY 11433	91-ft/East-northeast	Up-gradient	A3	Spill No. 9605038 was reported on 07/18/96. Soil and groundwater contamination were discovered during demolition of the facility. Soil excavation, ORC injections and groundwater monitoring have been conducted at the facility.

Based on distance from the Site combined with the assumed hydraulic relationship and/or the nature of the incident/regulatory status, none of the other facilities located within one-half mile of the Site identified in the NY Spills/LTANKS databases are expected to impact the environmental integrity of the Site.

Petroleum Bulk Storage Tanks (USTs/ASTs)
The NYSDEC PBS tank database was researched to identify listings for the Site and adjacent properties. The PBS Tank database is a listing of all facilities that are required to register their storage tanks for tracking purposes and not necessarily those with reported contamination incidents.

The Site is listed in the PBS UST and AST tank databases and these listings are considered as RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	Target Property	NA	A12, A14	PBS No. 2-190225. The site has five (5) 4,000-gallon diesel USTs and five (5) 4,000-gallon biodiesel UST. There are two (2) 15,000-gallon #6 fuel oil USTs and twelve (12) 2,000-gallon diesel USTs that are closed-in-place. There are two (2) 15,000-gallon #2 fuel oil USTs that are temporarily out-of-service. The site has a history of spills with one open spill case.

A total of 30 other facilities (10 UST sites and 20 AST sites) were identified within one-quarter mile from the Site. The following UST facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	229-ft/North-northwest	Cross-gradient	B75	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-gallon #2 fuel oil UST that are all closed-in-place.
BHELA 105-15 Merrick Blvd. Jamaica, NY 11433	91-ft/East-northeast	Up-gradient	D36	PBS No. 2-601509. The Site is an active retail gasoline filling station. The site has three (3) 4,000-gallon gasoline USTs and one (1) 4,000-gallon diesel UST. The Site is also listed on the NY AST database.
Jamaica Recycling Inc. 94-29 165th Street Jamaica, NY 11433	618-ft/Northwest	Cross-gradient	O158	EPA ID: NYN008011702. The facility is a transfer station.

Based on distance from the Site, assumed hydraulic relationship, the lack of known releases with the potential to affect the Site, and/or current regulatory status, none of the other facilities identified within one-quarter mile of the Site in the PBS database are expected to impact the environmental integrity of the Site.

NY Chemical Bulk Storage Database (NY CBS USTs/ASTs)
The NYSDEC chemical bulk storage (NY CBS UST/AST) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS UST/AST database lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons and/or in underground tanks of any size.

The Site was listed on the NY CBS AST database and this listing is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	Target Property	NA	A12	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS, and NY Spills databases.

NY Chemical Bulk Storage (NY CBS)
The NYSDEC chemical bulk storage (NY CBS) tank database was researched to identify listings for the Site and properties within the search radius. The NY CBS lists facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons.

The Site was listed on the NY CBS AST database and this listing is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	Target Property	NA	A12	CBS No. 2-000295. The site has a 1,000-gallon tank containing ethylene glycol. The site is also listed in the NY AST, NY CBS, and NY Spills databases.

One (1) other facility was listed within one-quarter mile of the Site. The facility is identified as Pep Boys #0438, and is located 474-ft north-northwest of the Site at 94-47 Merrick Boulevard. The facility status is listed as 'unregulated/closed'. Based on its distance from the Site and/or inferred down-gradient groundwater flow direction, this NY CBS listing is not anticipated to have affected the environmental integrity of the Site.

Historical Bulk Storage Tanks (USTs/ASTs)

These facilities have petroleum bulk storage capabilities in excess of 1,100 gallons and less than 400,000 gallons. This database contains detailed information per site. This database is no longer updated. More current data is presented in the PBS UST/AST databases. The Site is not listed in the HIST UST/AST databases.

The database identified the presence of five (5) historic UST facilities located within one-quarter mile of the Site. The following HIST UST facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
BP Service Station #11009 165-25 Liberty Avenue Jamaica, NY 11433	229-ft/North-northwest	Cross-gradient	B75	PBS No. 2-241865. The Site is an unregulated/closed gasoline filling station. The site has four (4) 4,000-gallon gasoline USTs, five (5) 550-gallon gasoline USTs, and one (1) 550-gallon #2 fuel oil UST that are all closed-in-place.

Based on distance from the Site, assumed hydraulic relationship, the lack of known releases with the potential to affect the Site, and/or current regulatory status, none of the other facilities identified within one-quarter mile of the Site in the HIST UST database are expected to impact the environmental integrity of the Site.

Integrated Compliance Information System (ICIS)

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

The Site was listed in the ICIS database under the Jamaica Bus Depot MTA, located at 165-18 South Road, Jamaica, New York (Enforcement Action ID: 02-2008-0847). This ICIS listing is not anticipated to have affected the environmental integrity of the Site.

Facility Index System / Facility Registry System (FINDS)
The Facility Index System / Facility Registry System (FINDS) contain both facility information and 'pointers' to other sources that contain more detail.

The Site was listed in the FINDS database under the Jamaica Bus Depot MTA, located at 165-18 South Road, Jamaica, New York (Registry ID: 110037227934). This FINDS listing is not anticipated to have affected the environmental integrity of the Site.

Enforcement & Compliance History Information (ECHO)
The Enforcement & Compliance History Information (ECHO) provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

The Site was listed in the ECHO database under the Jamaica Bus Depot MTA, located at 165-18 South Road, Jamaica, New York (Enforcement Action ID: 02-2008-0847). No violations are reported, therefore, this ECHO listing is not anticipated to have affected the environmental integrity of the Site.

New York State Voluntary and Brownfield Cleanup Program Sites (VCP/BCP)
The Voluntary and Brownfield remedial programs involve mostly private entities and private funds to remediate contaminated sites and return the properties to productive use. The NYSDEC VCP/BCP database was researched to identify listings for the Site and within a one-mile radius of the Site. The Site is not listed in the VCP/BCP databases.

One (1) BCP facility is listed within one mile of the Site. Based on its distance from the Site and/or inferred down-gradient groundwater flow direction, this BCP listing is not anticipated to have affected the environmental integrity of the Site.

E-Designation Site Listing (E-Designation)
The E (Environmental) Designation would ensure that sampling and remediation take place on the subject properties, and would avoid any significant impacts related to hazardous materials at these locations. The E-designations require that the owner of the sites conduct testing and sampling following set protocols, to the satisfaction of city agencies. In addition, the owner must remediate when appropriate. The Site is not listed with an E-Designation.

The database identified 54 E-Designation listings within a one-eighth-mile radius of the Site. The listings are associated with E-designation reference No. E-39 (Underground Gasoline Storage Tanks Testing Protocol) and E-175 (Underground Gasoline Storage Tanks Testing Protocol). The listed sites are all considered as RECs/VECs with respect to the Site.

Registered Dry Cleaners
The NYSDEC registered dry cleaners database was researched to identify listings within one-quarter mile of the Site. Neither the Site nor any other facility within one-quarter mile of the Site is listed in the dry cleaners database.

EDR Exclusive Historic Auto Stations (EDR US Hist Auto Stat)
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. This

database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is not listed in the EDR US Hist Auto Stat database.

The database search identified 26 listings within one-quarter mile of the Site. The EDR Hist Auto Stat facilities that are considered RECs/VECs with respect to the Site are as follows:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
103-16 Merrick Blvd. Jamaica, NY 11433	114 feet/ North-northwest	Up-gradient	B45	Identified as The Car Doctor and Breeze Auto Collision & Repair. Listed for years 1999-2001 and 2003.
104-28 Merrick Blvd. Jamaica, NY 11433	148 feet/ North	Up-gradient	E56	Identified as AAA Transmissions & Engines. Listed for years 2004, 2005, and 2009
104-09 Merrick Blvd. Jamaica, NY 11433	220 feet/ North	Up-gradient	E63	Identified as Junior Auto Collision, RJS Car Care Center Inc., L&C Auto Collision, NASCAR Auto Body Inc., and Integrity Collision & Towing. Listed for years 2001-2012.
104-13 Merrick Blvd. Jamaica, NY 11433	222 feet/ North	Up-gradient	E66	Identified as Full Line Auto Repairs. Listed for year 2002.
104-15 Merrick Blvd. Jamaica, NY 11433	223 feet/ North-northeast	Up-gradient	E67	Identified as Dynamic Autoworks Inc., Ace Auto Body & Truck Repair, Jimmy's Trans & Auto Repair, and Sports Line Auto Repair. Listed for years 1999-2005, 2008, 2010, and 2012.
104-19 Merrick Blvd. Jamaica, NY 11433	224 feet/ North-northeast	Up-gradient	E69	Identified as Full Line Auto Repairs. Listed for years 1999-2001, 2003-2007, and 2009-2012.
104-21 Merrick Blvd. Jamaica, NY 11433	225 feet/ North	Up-gradient	E72	Identified as Taylor Auto Collision Inc. Listed for years 1999-2002, 2004-2009, and 2011.
165-25 Liberty Avenue Jamaica, NY 11433	229 feet/ North-northwest	Cross-gradient	B74	Identified as Rut Gas II. Listed for years 1999-2001
166-15 Liberty Avenue Jamaica, NY 11433	229 feet/ North-northwest	Down-gradient	F76	Identified as Worldwide Auto. Listed for years 1999, 200, 2001, 2003, 2010, 2011, and 2012.
94-40 Merrick Blvd. Jamaica, NY 11433	447 feet/ North-northwest	Cross-gradient	F111	Identified as Super Sport Auto Care. Listed for year 2003.
94-47 Merrick Blvd. Jamaica, NY 11433	474 feet/ North-northwest	Up-gradient	F118	Identified as Pep Boys Automotive Center. Listed for year 2007.
94-38 Merrick Blvd. Jamaica, NY 11433	507 feet/ North-northwest	Cross-gradient	L126	Identified as Full Line Collision. Listed for years 2002-2009.

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
94-24 Merrick Blvd. Jamaica, NY 11433	588 feet/ North-northwest	Cross-gradient	L147	Identified as A&B Collision & Auto Repairs Inc. Listed for years 2011 and 2012.
168-01 Liberty Avenue Jamaica, NY 11433	600 feet/ North	Up-gradient	K151	Identified as Parkland Auto Repair & Body. Listed for years 2010 and 2011.
168-17 Liberty Avenue Jamaica, NY 11433	646 feet/ North	Up-gradient	K166	Identified as Queens Truck Repair. Listed for years 2003, 2004, and 2008
106-04 Merrick Blvd. Jamaica, NY 11433	20 feet/ East	Up-gradient	D21	Identified as Birds Auto Repair. Listed for years 1999-2012.
105-02 Merrick Blvd. Jamaica, NY 11433	48 feet/ East-northeast	Up-gradient	A28	Identified as Garvey's Auto Repair and Ralke Auto Repairs. Listed for years 1999, 2000, 2011, and 2012.
105-17 Merrick Blvd. Jamaica, NY 11433	91 feet/ East-northeast	Up-gradient	D32	Identified as Fred's Auto Repair. Listed for year 2002.
105-15 Merrick Blvd. Jamaica, NY 11433	91 feet/ East-northeast	Up-gradient	D35	Identified as Citgo Gas Station and Henrys Repair Shop. Listed for years 1999-2001.
106-03 Merrick Blvd. Jamaica, NY 11433	92 feet/ East	Up-gradient	D37	Identified as Truck Repair Services. Listed for years 2011 and 2012.
105-09 Merrick Blvd. Jamaica, NY 11433	95 feet/ East-northeast	Up-gradient	D38	Identified as Inter City Tire Corp. Listed for year 2006.
107-17 Merrick Blvd. Jamaica, NY 11433	339 feet/ East-southeast	Cross-gradient	G93	Identified as E&D Auto Seat Cover, Dave's Precision Auto Service Inc., Inspection City Auto Repair Inc., and Haldane Auto Service. Listed for years 1999-2008 and 2010-2012.
107-35 Merrick Blvd. Jamaica, NY 11433	434 feet/ East-southeast	Cross-gradient	G110	Identified as Mystique Auto Body Works Corporation. Listed for years 1999-2002, 2004, 2005, and 2009.
107-55 Merrick Blvd. Jamaica, NY 11433	552 feet/ East-southeast	Cross-gradient	M138	Identified as General Auto Body Works Inc. Listed for years 1999, 2000, 2002-2005, and 2009-2012.
107-57 Merrick Blvd. Jamaica, NY 11433	565 feet/ East-southeast	Cross-gradient	M142	Identified as Birds Auto Repair and General Auto Body Works Inc. Listed for years 2003 and 2005-2012.
107-61 Merrick Blvd. Jamaica, NY 11433	594 feet/ East-southeast	Cross-gradient	M148	Identified as D&G Foreign Auto Repair. Listed for years 2010-2012.

Due to their distances from the Site and/or the presumed groundwater flow direction none of the other EDR Hist Auto Stat facilities are considered RECs/VECs with respect to the Site.

EDR Exclusive Historic Dry Cleaners (EDR US Hist Cleaners)
EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches. The Site is not listed in the EDR US Hist Cleaners database.

The database search identified one (1) listing within one-half mile of the Site. This facility has the potential to impact the environmental integrity of the Site and is considered a REC/VEC:

Listing	Distance/ Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
107-37 166th Street Jamaica, NY 11433	426 feet/ South-southeast	Down-gradient	J105	Identified as ABD Cleaners Corp. Listed for year 2009.

NY Manifest
The NY Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

The Site was listed on the NY Manifest database and this listing is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	Target Property	NA	A14	The site is also listed in the RCRA-CESQG, NY AST, NY CBS, NY Spills, NJ and RI Manifest databases.

Seventy-five (75) other NY Manifest facilities were identified within one-quarter mile of the Site. The following NY Manifest facilities have the potential to impact the environmental integrity of the Site and are considered RECs/VECs:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Amoco Service Station 165-25 Liberty Avenue Jamaica, NY 11433	229-ft/North-northwest	Cross-gradient	B73	EPA ID: NYD986903763. The Site is also listed on the RCRA NonGen / NLR database. The facility is a retail gasoline filling station.
R&S Parts & Service Inc. DBA Strauss Auto 165-08 Liberty Avenue Jamaica, NY 11433	465-ft/North	Cross-gradient	K115	EPA ID: NYD980758080. The Site is also listed on the NY Manifest database. The facility generates spent halogenated solvents.

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Calvin Auto Body 106-04A Merrick Blvd. Jamaica, NY 11433	20-ft/East	Up-gradient	D22	EPA ID: NYD987030012. The Site is also listed on the RCRA NonGen / NLR database. The facility generates ignitable waste, methyl ethyl ketone, spent halogenated solvents, and spent non-halogenated solvents.
Calvin Auto Body 107-17 Merrick Blvd. Jamaica, NY 11433	339-ft/East-southeast	Cross-gradient	G95	EPA ID: NYD981874407. The Site is also listed on the RCRA NonGen / NLR database.
General Auto Body 107-57 Merrick Blvd. Jamaica, NY 11433	565-ft/East-southeast	Cross-gradient	M141	EPA ID: NYD012364683. The Site is also listed on the NY Manifest database.

Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NY Manifest facilities are expected to impact the environmental integrity of the Site.

NJ Manifest
The NJ Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

The Site was listed on the NJ Manifest database and this listing is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	Target Property	NA	A1	The site is also listed in the RCRA-CESQG, NY AST, NY CBS, NY Spills, and NY and RI Manifest databases.

Seven (7) other NJ Manifest facilities were identified within one-quarter mile of the Site. Due to their distances from the Site, lack of reported violations, and/or the presumed groundwater flow direction none of the other NJ Manifest facilities are expected to impact the environmental integrity of the Site.

RI Manifest
The RI Manifest database is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

The Site was listed on the NJ Manifest database and this listing is considered a REC/VEC:

Listing	Distance / Direction	Assumed Hydraulic Gradient	Map ID Number	Regulatory Site ID #/ Status/Available Data
Jamaica Bus Depot - NYCT 165-18 South Road Jamaica, NY 11433	Target Property	NA	A1	This manifest is for petroleum distillates transported to Safety-Kleen Systems Inc. The site is also listed in the RCRA-CESQG, NY AST, NY CBS, NY Spills, and NY and NJ Manifest databases.

NY SWRCY
The SWRCY database contains a list of registered recycling facilities. The Site is not listed in the SWRCY database.

One SWRCY facility was identified within one-half mile of the Site. The facility is identified as EWG Glass Recovery and Recycling and is located approximately 2,333 feet west of the Site at 94-54 158th Street. Due to its distance from the Site and/or the presumed groundwater flow direction this facility is not considered a REC/VEC with respect to the Site.

Air Emissions Data (US AIRS)
The US AIRS database contains point source emissions inventory data. The Site was listed in the US AIRS database under NYCTA, located at 165-18 South Road. The listing was found to be in compliance with procedural requirements and potential emissions are below all applicable major source thresholds. This US AIRS listing is not anticipated to have affected the environmental integrity of the Site.

Manufactured Gas Plant Sites (Coal Gas)
Manufactured gas sites were used in the United States from the 1800's to the 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water and produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils, and other compounds are potentially hazardous to human health and the environment. The byproducts were frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination. The Manufactured Gas Plant (MGP) Sites database was researched to identify any listings for the Site and within a one-mile radius of the Site. The Site is not listed in the MGP database.

One (1) facility within one mile of the Site is listed in the MGP database. The facility is identified as Jamaica Gas and Light and is located approximately 2,588-ft west of the Site at Beaver Road and 158th Street. Due to its distance from the Site and/or the presumed groundwater flow direction this facility is not considered a REC/VEC with respect to the Site.

Orphan Listings
A review of the Orphan Listings in the database search report indicated a total of three (3) listings. One of these listings is for a spill (Spill No. 1601057) at the Jamaica Bus Depot. This spill case is closed and is consolidated under open spill case number 9010039. The other two (2) Orphan sites are not considered RECs based on their estimated distances from the Site (none adjacent or on the Site block) and/or the nature of the activity/release.

6.2 Local Regulatory Agency Research

A review of local records for the Site was accomplished by contacting offices of New York City regulatory agencies including the NYCDOB, NYCDEP, Department of Health and Mental Hygiene (NYCDOHMH), NYCDCP, and the Fire Department (FDNY). The results of the review of local records are presented below. Copies of the correspondences are included in *Appendix K.*

New York City Department of Buildings (NYCDOB)
NYCDOB records were reviewed on July 19, 2016 to determine whether there are references to buildings, tanks or other structures, property use or inspection reports that indicate the presence, past use, or release of hazardous substances, wastes, or petroleum products at the Site. The NYCDOB records review indicated that the Site has 20 active NYCDOB violations. These violations are for Local Law 62/91 regarding failure to file an annual boiler inspection report. There were no RECs identified as a result of review of NYCDOB records. Copies of the NYCDOB records are included in *Appendix J*.

New York City Department of Environmental Protection (NYCDEP)
The NYCDEP maintains files of incidents involving environmentally regulated materials. The records maintained by NYCDEP include reports of spills of hazardous chemicals and citizen's complaints on environmental issues. NYCDEP information concerning the Site was requested in a formal application for records dated August 22, 2016. At the time this report was issued, STV had not yet received a response from NYCDEP. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of Health and Mental Hygiene (NYCDOHMH)
The NYCDOHMH, Bureau of Environmental Investigations (BEI) maintains files of health-related environmental incidents in the City of New York. These incidents may include spills of hazardous chemicals, citizen's complaints regarding asbestos issues, or reports of chemical odors or fumes. NYCDOHMH information concerning the Site was requested in a formal FOIL request form dated August 22, 2016. NYCDOHMH acknowledged the request on August 22, 2016. At the time this report was issued, STV had not yet received any response from NYCDOHMH. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

New York City Department of City Planning (NYCDCP)
STV reviewed the NYCDCP Zoning Map 14d, available via the NYCDCP on-line web-site. According to the map, the Site is currently located within zone “M1-1”, which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities. A zoning map is included in *Appendix J*.

“E” designations for blocks or lots on city zoning maps were issued since approximately March 2003 and indicate that potential environmental issues are associated with these parcels. The environmental issues may or may not be associated with potential contamination by hazardous or petroleum substances. Parcels with “E” designations require that the fee owner of the site conduct a testing and sampling protocol, and remediation where appropriate, to the satisfaction of the New York City Office of Environmental Remediation (NYCOER) before the issuance of a building permit by the NYCDOB pursuant to the provisions of Section 11-15 of the Zoning Resolution (Environmental Requirements).

The Site is not listed with an E-Designation.

New York City Fire Department (FDNY)

The FDNY maintains information concerning petroleum USTs. STV submitted a Fuel Oil Record Search Request Form to the FDNY on August 22, 2016 for information concerning the Site. At the time this report was issued, STV had not yet received a response from FDNY. Upon receipt of this information, STV will review the response and, if conclusions contained within this report are affected, will submit an addendum to this report.

7.0 USER RESPONSIBILITIES

7.1 Environmental Liens or Activity and Use Limitations

An Environmental Lien Search Report was obtained from EDR for the Site. The Environmental Lien Search Report provides results from a search of available and current land title records for environmental liens and other activity and use limitations, such as engineering controls and institutional controls. A review of the report indicates that no environmental liens or other activity and use limitations were found for the Site. A copy of the environmental lien search report is included in *Appendix J*.

7.2 Valuation Reduction for Environmental Issues

No information was available at the time of the assessment regarding the relationship of the purchase price of the property to the fair market value of the property. If information is received regarding valuation reduction for environmental issues which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.3 Knowledge or Experience of the User

No person with specialized knowledge or experience that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment other than Mr. Kenneth Lam, the Jamaica Bus Depot superintendent. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.4 Commonly Known or Reasonably Ascertainable Information

No person within the local community with commonly known or reasonably ascertainable information about the property that is material to RECs and/or the screening of VECs in connection with the Site was available at the time of the assessment. If further information is received regarding RECs and/or VECs which changes the conclusions or recommendations presented in this report, an addendum will be submitted to NYCT.

7.5 The Degree of Obviousness of the Presence or Likely Presence of Contamination at the Property

NYCT is not currently aware of any obvious indicators that point to the presence or likely presence of new or imminent releases at the property. Additionally, NYCT is not currently aware of any obvious indicators important to the screening of VECs in connection with the property.

8.0 SITE RECONNAISSANCE AND INTERVIEWS

8.1 Methodology and Limiting Conditions

The inspection of the Site included observations of the property and surrounding area (Site reconnaissance) that were made to identify potential sources or indications of hazardous substances, including: ASTs; USTs; tank vents and fill ports; transformers and other items that could contain PCBs; waste storage areas; hazardous materials usage, storage, and disposal; stained surfaces and soils; stressed vegetation; leaks; and, odors. In addition, readily-observable portions of the properties immediately adjacent to the Site were viewed from public rights-of-way to identify or determine the likelihood of any of the aforementioned potential sources of contamination being present. There were no limiting conditions with respect to impact on the accuracy of the Site reconnaissance.

8.2 Site Reconnaissance

Mr. Doane Cafferty of STV performed the Site visit on August 2, 2016, and was accompanied by Mr. Kenneth Lam, the Jamaica Bus Depot superintendent, Mr. John Hu and Ms. Mary Kong with NYCT, several STV engineers representing various disciplines, and Ms. Julie Abell Horn with Historical Perspectives, Inc. At the time of the inspection, the weather was approximately 85º F with sunny skies. The weather did not prevent STV from conducting a thorough inspection of the Site and surrounding areas. *Appendix C* provides representative photographs of the Site.

Lot 46 contains an approximately 58,000 SF single story structure constructed in 1939. The building is comprised of two 'halves'. The northern 'half' houses fuel lanes, bus wash lanes, chassis wash stations, interior wash stations, and administrative offices. The southern 'half' contains maintenance bays, various chemical and waste storage areas, office space, and a tank vault room. Lot 80 contains a diesel and heating oil tank vault and a single-story, brick, pump room building. Lots 84, 97, and 103 are open lots used for parking of buses. The depot currently maintains and services approximately 196 buses; however, the property cannot accommodate on-site parking for the current bus fleet, and approximately 50 buses and numerous employee vehicles park on surrounding neighborhood streets. The Site can be accessed from Merrick Boulevard, 107th Avenue, and South Road

The Site is bound to the north by South Road followed by a self-storage facility and a parking lot and subsequently Liberty Avenue; to the east by several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility followed by Merrick Boulevard and subsequently various auto repair facilities and a retail gasoline station; to the south by a mixed-use residential/commercial building and an auto collision repair shop followed by 107th Avenue and subsequently a senior residential living center; and to the west by residential dwellings followed by 165th Street.

8.3 Current and Historical Use Interviews

The following knowledgeable persons were interviewed with regard to the Site pursuant to ASTM 1527-13 Section 10:

8.3.1 Current Property Owner

Block 10164, Lot 46 is currently owned by "The City of New York". Based on the research, this entity has owned this property since at least 1947. Block 10164, Lots 80, 84, and 97 are currently owned by "New York City Transit Authority". Based on the research, this entity has owned these properties since

at least 1961. Block 10164, Lot 103 is currently owned by "Philip H. Gilsten, acting Treasurer of the City of New York". Based on the research, this entity has owned this property since at least 1955. All prior ownership information reviewed is presented in *Appendix J*. The review of current and historical ownership and tax records information did not reveal evidence of RECs or VECs associated with prior use of the Site.

8.3.2 Current Site Operator or Key Site Manager

Name	Title/Company	Years Associated with Site
Mr. Kenneth Lam	Jamaica Bus Depot superintendent	Approx. 16

Detailed information provided during the above-listed interview is documented on Record of Communication forms in *Appendix K*.

8.3.3 Site Occupants

Other than the Owner's representative, Site occupants were not available to interview during this assessment.

8.3.4 Past Owners, Operators and Occupants

Past owners or occupants of the Site were not available to interview during this assessment. STV was unable to obtain contact information from any previous owners or occupants.

8.3.5 Report User

Name	Title/Company	Years Associated with Site
Mr. Emil Dul	NYCT Real Estate Department	<1

According to the ASTM E 1527-13 User Questionnaire provided by Mr. Emil Dul of NYCT's Real Estate Department, NYCT is not aware of any environmental liens, land use limitations, specialized knowledge, or past uses of the Site. Detailed information provided during the above-listed interviews is referenced in applicable sections of this report and a copy of the completed ASTM E1527-13 User Questionnaire is included in *Appendix K*.

8.4 Hazardous Substances and Petroleum Products Storage and Handling

8.4.1 Hazardous Substances

The Site has a chemical drum storage area, infectious waste storage area, hazardous waste storage area, and spent bulb storage area located in the southern half of the depot building. The aboveground tank vault room located in the southwestern portion of the Site contained a 1,000-gallon antifreeze AST and a 1,000-gallon automatic transmission fluid AST. Batteries were stored on wooden pallets in the northern half of the depot building. Several Safety-Kleen® solvent wash tubs were located at various maintenance stations throughout the depot building. Several pallets with 55-gallon drums of transmission fluid and antifreeze or plastic tanks of windshield wiper fluid, diesel exhaust fluid, or degreaser concentrate were stored in the southern half of the depot building. There was no visual or olfactory evidence of leakage or

floor staining in the area where this material was stored. STV concludes that storage and handling of hazardous substances do not represent a REC or VEC for the Site.

8.4.2 Petroleum Products Storage and Handling

The Site has a diesel and heating oil tank farm located in the eastern portion of the Site (Lot 80). There are ten (10) 4,000-gallon diesel USTs and two (2) 15,000-gallon heating oil USTs in a subterranean concrete vault. A pump room is located adjacent to the tank vault and the tank vent pipes are affixed to the exterior of the pump room building. Two (2) fueling lanes with dispensers are located in the northern half of the depot building. Several waste oil drop sites and a 1,000-gallon waste oil AST were also located within the southern half of the depot building. Several plastic 5-gallon buckets of various used oils were staged on top of drip tank in the southern half of the depot building. Multiple hydraulic hoists and synthetic lubricant dispensers were located throughout the depot building. A pallet with 55-gallon drums of motor oil was stored in the southern half of the depot building. A tank vault room was located in the southwestern portion of the building that contained a 2,000-gallon motor oil AST. An oil-water separator is located in the open lot area of the Site. Based on the open spill case (Spill No. 9010039) STV concludes that storage and handling of petroleum products represents a REC or VEC for the Site.

8.5 Solid Waste Generation, Storage and Disposal

A drum for oily rags was located in the maintenance area of the depot building. No containers for solid waste were observed on the Site other than garbage dumpsters. Solid waste generation, storage, and disposal are not considered a REC or a VEC with respect to the Site.

8.6 Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are toxic components of various products including, but not limited to caulking materials, light ballasts, and dielectric and hydraulic fluids that were formerly used in electrical equipment such as transformers and hydraulic elevators/lifts. The manufacture and use of PCBs was banned in the United States in 1978.

STV did not observe any electrical transformers on or adjacent to the Site. Fluorescent lighting fixtures and window caulking were identified throughout the Site. Based on the age of the Site building (circa 1939), there is a potential for the presence of suspect PCB-containing light ballasts and caulking materials. These materials represent an environmental concern with respect to the Site.

8.7 Asbestos-Containing Material (ACM)

STV conducted a limited visual survey (i.e., within accessible areas only) for the presence of suspect ACM within the Site. The intent of the survey was to identify exposed suspect ACM through preliminary non-destructive observations. No sampling of suspect ACM was performed during this investigation. Pursuant to applicable asbestos control regulations and guidelines, STV considered any observed suspect materials to be asbestos-containing.

Potential ACM at the Site consisted of acoustic ceiling tiles, tile grout, tile mortar, pipe insulation, pipe insulation paper, caulking, vinyl floor tiles, mastics, and gypsum board and joint compound. These materials were found to be in generally good condition. The suspect ACM identified at the Site is considered an environmental concern.

8.8 Lead-Based Paint (LBP) Survey

During the Site inspection, a limited visual assessment of all accessible painted surfaces was performed. No sampling or intrusive work was performed as this is outside the scope of work of this assessment. All painted surfaces are assumed to be LBP.

Interior painted surfaces of the Site were generally found to be in good condition. Painted surfaces were observed on the interior brick of the building and window sills. Based on the age of the Site building (circa 1939) LBP is an environmental concern.

8.9 Regulatory Compliance

STV does not consider regulatory compliance to be an environmental concern for the Site.

8.10 Electromagnetic Fields

A visual inspection was performed for the presence of high voltage power lines and or substations located in close proximity to the Site. No such power lines or substations were identified; therefore, STV does not consider electromagnetic fields to be an environmental concern at the Site.

8.11 Other Environmental Concerns (Methane, Mold, etc.)

Based on a review of the historic topographic map and knowledge of the area, the Site was not located in an area of suspected former wetlands, and potential subsurface methane is not considered an environmental concern at the Site.

As part of this assessment, STV conducted a limited assessment for the presence of water damage and odors, indicative of the potential for mold growth, on accessible surfaces within the Site. There was no evidence of water damage or mold noted during the Site inspection.

9.0 SUMMARY OF FINDINGS

The Site is located at 165-18 South Road, Jamaica, Queens, New York 11433 (Block 10164, Lots 46, 80, 84, 97, and 103). The Site is comprised of five (5) contiguous lots that total approximately 171,461 square feet (SF). Lot 46 contains an approximately 58,000 SF single story structure constructed in 1939. Lot 80 contains a diesel and heating oil tank vault and pump room building. Lots 84, 97, and 103 are open lots used for parking of buses.

The Site is bound to the north by South Road followed by a self-storage facility and a parking lot and subsequently Liberty Avenue; to the east by several lots that are each developed with one-story buildings that were formerly occupied by an industrial/manufacturing facility followed by Merrick Boulevard and subsequently various auto repair facilities and a retail gasoline station; to the south by a mixed-use residential/commercial building and an auto collision repair shop followed by 107th Avenue and subsequently a senior residential living center; and to the west by residential dwellings followed by 165th Street.

NYCDCP Zoning Map 14d indicated the Site is designated as zone "M1-1", which designates a manufacturing district that typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale services and storage facilities.

The Site is generally flat and the topography of the surrounding area slopes to the south-southeast. According to the USGS 7.5-Minute Quadrangle Map, Jamaica, NY, dated 2013, and information contained in the regulatory agency database report, the Site elevation is approximately 32 feet amsl.

The nearest surface water body is a pond in Captain Tilly Park, located approximately 4,215 feet north-northwest of the Site. Based on topography, the groundwater flow in the area of the Site is assumed to be south-southwest towards Jamaica Bay. The depth to groundwater is estimated to range from approximately 11-20 feet bgs.

The Phase I ESA identified on-Site RECs pertaining to an open petroleum spill case; potential buried structures from former buildings that could contain underground storage tanks and/or historic fill materials of unknown origin; the historic use of a portion of the Site as a gasoline filling station; and the current and historical use of the Site as bus service station and maintenance garage.

Off-site RECs include three solid waste management facilities; a nearby facility with an open spill; two facilities that currently generate spent halogenated solvents; one facility that historically generated cadmium, lead, and waste oils; an active gas station; several historical and current auto repair facilities; one historic dry cleaner; several nearby properties with E-Designation listings for underground storage tanks testing protocol; and the historical presence of a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, a junk yard, and gasoline filling stations with USTs in close proximity to the Site. The Phase I ESA revealed environmental concerns associated with suspect ACM, LBP, PCB-containing materials.

10.0 CONCLUSIONS AND RECOMMENDATIONS

STV has performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527-13 and the requirements of NYCT. Any additions to, exceptions to, or deletions from this practice are described in Section 2.0 of this report.

The Phase I ESA has revealed the following RECs, CRECs, and/or VECs associated with the Site:

On-Site RECs/CRECs/VECs:

- The Site has an open spill case (Spill No. 9010039) that is currently being remediated via a pump and treat remediation system under a NYSDEC Global Consent Order (CO2-20000101-3341).

- The Site property was previously developed with multiple low-rise structures. Potential buried structures from former buildings on the Site property could contain underground storage tanks (USTs) and/or historic fill materials of unknown origin, and are considered a REC/VEC with respect to the Site.

- The historic use of a portion of the Site as a gasoline filling station is considered a REC/VEC.

- The Site is listed in multiple Federal and State regulatory agency databases. The current and historic use of the Site as a bus service station and maintenance garage is considered a REC/VEC.

Off-Site RECs/CRECs/VECs:

- The surrounding area historically included a blacksmith, a sign painters shop, auto painting shops, iron works, auto and truck repair facilities, carpet cleaners, paint shops, parking lots, a junk yard, and gasoline filling stations with USTs. Facilities where petroleum and/or hazardous materials may have been used in operations are considered RECs/VECs.

- Three (3) solid waste management facilities are located in close proximity to the Site and are considered RECs/VECs.

- Two (2) facilities that generate spent halogenated solvents are located in close proximity to the Site and are considered RECs/VECs.

- One (1) facility that historically generated cadmium, lead, and waste oils and received violations is located in close proximity to the Site and is considered a REC/VEC.

- One (1) active gasoline filling station and several historical gasoline filling stations were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- Several historic and current auto repair facilities were located in areas surrounding the Site. These properties are considered RECs/VECs based on their proximity to the Site.

- One (1) historical dry cleaner is located in close proximity to the Site. This facility is considered a REC/VEC based on the presumed storage and regular use of solvents.

- Several properties on the Site block and on the adjacent and surrounding blocks are listed with E-designations for E-39 or E-175 (Underground Gasoline Storage Tanks Testing Protocol) and are considered RECs/VECs.

This Phase I ESA has revealed the following environmental concerns associated with the Site:

- Suspect ACM consisting of tile grout, tile mortar, pipe insulation, caulking, vinyl floor tiles, mastic, and gypsum board and joint compound exists throughout the Site.
- Based on the age of the Site building (circa 1939), there is the potential for the presence of suspect LBP identified on interior and exterior painted surfaces.
- Fluorescent lighting fixtures and window caulking identified throughout the building may contain PCBs.

Recommendations

STV recommends that the Site continue with the efforts currently being implemented under the NYSDEC Global Consent Order (CO2-20000101-3341). In order to avoid adverse impacts from any contamination, any reconstruction activities involving disturbance of existing soils should be conducted in accordance with a site-specific Construction Health and Safety Plan, which would detail measures to reduce the potential for exposure (e.g., dust control) and to identify and manage known contamination and unexpectedly encountered contamination. Erosion and sediment control measures and storm water management measures should be implemented during any subsurface construction activities to protect nearby storm water drains from contaminants potentially entrained in storm water runoff. To eliminate the potential for exposure of future Site occupants, a minimum of two (2) feet of clean soil underlain by a demarcation liner should be placed on any areas that will not be covered by paved surfaces or permanent structures associated with any new Site construction. Prior to or during construction activities, any underground and aboveground storage tank systems should be removed and disposed of in accordance with applicable Federal, State, and local regulations. If associated contaminated soil and/or groundwater are discovered during the tank removal, they should be remediated according to the requirements of the NYSDEC Spill Response and Remediation program. Post removal endpoint soil samples should be collected to ensure that soil exceeding applicable guidance values/standards is removed. All contaminated materials removed from the Site should be properly transported and disposed of offsite in accordance with all applicable Federal, State, and local regulations. STV further recommends that any ACM, LBP, and/or PCB-containing materials affected by future renovations, repairs or demolition at the Site be identified and properly managed during such activities.

11.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

STV Incorporated (STV) has performed a Phase I ESA of the property located at 165-18 South Road, Jamaica, Queens, New York 11433 (Block 10164, Lots 46, 80, 84, 97, and 103). The scope of the Phase I ESA was consistent with the requirements of ASTM Standard Practice E 1527-13 and of NYCT. Signatures of the Environmental Professionals who participated in conducting this Phase I ESA are provided below. Qualifications for these individuals are provided in *Appendix L*. STV declares that to the best of their professional knowledge and belief, they meet(s) the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. STV has the specific qualifications based on education, training and experience to assess the subject property. STV has developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Prepared By:
Doane E. Cafferty, LEED AP BD+C
Senior Environmental Scientist

Reviewed By:
Christine Vilardi, P.G., LEED Green Associate
Quality Control Officer

Reviewed By:
Peter S. Helseth, P.E.
Senior Project Manager

12.0 REFERENCES

Persons Interviewed:

- Mr. Kenneth Lam, NYCT Jamaica Bus Depot Superintendent., 165-18 South Road, Jamaica, Queens, New York, August 2, 2016.

Resources Consulted:

- EDR – Radius Map™ Report with GeoCheck®, July 15, 2016.
- EDR – Historical Sanborn® Maps: 1891, 1897, 1901, 1912, 1926, 1951, 1981, 1982, 1986, 1988-1993, 1995, 1996, 1999, and 2001-2006.
- EDR – Aerial Photographs: 1951, 1954, 1961, 1966, 1975, 1994, 2006, 2009, and 2011.
- EDR – USGS Historical Topographic Maps: 1897, 1898, 1900, 1947, 1957, 1966, 1979, 1994, and 2013.
- EDR – City Directories: 1922, 1934, 1939, 1945, 1950, 1962, 1967, 1970, 1976, 1983, 1991, 1996, 2000, 2005, 2008, and 2013.
- EDR - Environmental Lien Search dated July 27, 2016.
- NYC Department of Finance – Assessment Roll: 2014-2016.
- NYC Office of Environmental Remediation – SPEED Portal.
- Oasis Website - www.oasisnyc.net/OASISMap.htm.
- FEMA Map Services Center Website - www.msc.fema.gov
- FEMA Preliminary Flood Maps & Data: Region II Coastal Analysis and Mapping – www.region2coastal.com/view-flood-maps-data/view-preliminary-flood-map-data/
- National Wetlands Inventory Website - www.fws.gov/nwi/
- USGS New York Water Science Center: Long Island Depth to Water Viewer 2013 (http://ny.water.usgs.gov/maps/li-dtw13/) and Groundwater Conditions on Long Island, New York in 2013 (http://ny.water.usgs.gov/maps/li-gc13/)

Regulatory Agencies Contacted:

- New York City Department of Buildings, July 19, 2016.
- New York City Fire Department, August 22, 2016.
- New York City Planning and Zoning Department, July 19, 2015.
- New York City Department of Environmental Protection, August 22, 2016.
- New York City Department of Health and Mental Hygiene, August 22, 2016.
- New York State Environmental Conservation August 22, 2016.
- New York State Department of Health, August 22, 2016.
- Unites States Environmental Protection Agency, August 22, 2016.

Documents and Maps:

- ASTM International (ASTM) 2013, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," ASTM Designation E 1527-13.
- ASTM E 2600-10 "Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions."
- STV Potential Property Acquisition Eight Properties Near Jamaica Bus Depot, Jamaica, New York, dated February 17, 2012.

- U.S. Geological Survey, Ground-Water and Geohydrologic Conditions in Queens County, Long Island, New York, Julian Soren, 1971. USGS Water Supply Paper 2001-A.
- U.S. Geological Survey, Ground-Water Resources of Kings and Queens Counties, Long Island, New York by Herbert Buxton and Peter Schernoff. 1999. Water Supply Paper 2498.
- USGS LI Depth-to Water Tool for Long Island (USGS, 2013).

13.0 APPENDICES

Appendix A - Site Location Map
Appendix B - Site Plan
Appendix C - Site Photographs
Appendix D - National Wetlands Inventory Map
Appendix E - FEMA Flood Insurance Rate Map
Appendix F - Historical Topographic Maps
Appendix G - Historical Aerial Photographs
Appendix H - Historical Sanborn Fire Insurance Maps
Appendix I - Regulatory Agency Database Report
Appendix J - Supporting Documents
Appendix K - Records of Communication & Agency Correspondence
Appendix L - Qualifications of Environmental Professionals

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Appendix G: Construction

- Construction Phasing and Duration
- LOS (Level of Service) Tables
- Traffic Network (Existing / No Build / Construction)
- Synchro Analysis (Existing / No Build / Construction)
- Construction Noise Alternative D Calculations
- Air Emission Burden Calculation Sheets

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Construction Phasing and Duration

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RECONSTRUCTION OF JAMAICA BUS DEPOT
DESIGN OPTION A - 42 MONTHS

Item	Task	Peak Crew Size	On-site Equipment	# Trucks per Peak Day	Month																																									
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
PHASE 0 (Design and mobilization)																																														
1	Preliminary design																																													
2	Final design																																													
3	Mobilization	10																																												
PHASE I (Construction of new JBD along Merrick Boulevard)																																														
4	Excavation and site preparation	12	Backhoes, excavators, dump trucks, jack hammers, and compressors	10																																										
5	Remediation (if needed)	10	TBD																																											
6	Spread footings	24	Concrete pump truck and concrete trucks	20																																										
7	Storage Tanks, Utilities (electric, gas, water, telephone services, plumbing)	20	Excavator	2																																										
8	Structural Steel, metal decks	40	1 crane, 4 forklift	15																																										
9	Backfill and slab on grade	20	Backhoes, concrete trucks, compactors, and concrete pump truck	15																																										
10	Floor slabs, ramps, and roof	20	Concrete trucks and concrete pump truck	10																																										
11	Rough-in electrical, mechanical, plumbing, communication	160	Scissor lifts and forklifts	25																																										
12	Precast panels, doors, and windows	40	Scissor lifts, forklifts, and crane	3																																										
13	Complete electrical, mechanical, plumbing, communications	80	Scissor lifts and forklifts	5																																										
14	Finishing and commissioning	80	Scissor lifts and forklifts	3																																										
15	Transition to new facility	20	Forklifts	0																																										
PHASE II (construction in the footprint of exsting building)																																														
16	Demolition	12	Excavators, dump trucks, jack hammers, and compressor	20																																										
17	Excavation and site preparation	12	Backhoes, excavators, dump trucks, jack hammers, and compressors	10																																										
18	Sound barrier & light poles (remediation, if needed)	12	Crane and concrete trucks	15																																										
19	Concrete paving, storm sewer	20	Concrete trucks, backhoes, and compactors	10																																										
			Total Number of Workers				*10*	*10*	*12*	*22*	*46*	*24*	*24*	*24*	*44*	*60*	*60*	*80*	*80*	*80*	***280***	***280***	***280***	*240*	*180*	*260*	*80*	*160*	*160*	*160*	*160*	*160*	*160*	*80*	*80*	*20*	*24*	*24*	*24*	*36*	*36*	*20*	*20*	*20*	*20*	*20*
			Total Number of Truck Trips				*0*	*0*	*10*	*10*	*30*	*20*	*20*	*20*	*22*	*17*	*17*	*32*	*32*	*40*	***68***	***68***	***68***	*53*	*35*	*40*	*5*	*8*	*8*	*8*	*8*	*8*	*8*	*3*	*3*	*0*	*30*	*30*	*30*	*45*	*45*	*10*	*10*	*10*	*10*	*10*

RECONSTRUCTION OF JAMAICA BUS DEPOT
DESIGN OPTION B - 46 MONTHS

Item	Task	Peak Crew Size	On-site Equipment	# Trucks per Peak Day	Month
					1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46
PHASE 0 (Design and mobilization)					
1	Preliminary design				
2	Final design				
3	Mobilization	10			
PHASE I (Construction of new JBD along Merrick Boulevard)					
4	Excavation and site preparation	12	Backhoes, excavators, dump trucks, jack hammers, and compressors	10	
5	Remediation (if needed)	10	TBD		
6	Spread footings	24	Concrete pump truck and concrete trucks	20	
7	Storage Tanks, Utilities (electric, gas, water, telephone services, plumbing)	20	Excavator	2	
8	Structural Steel, metal decks	40	Crane and forklifts	15	
9	Backfill and slab on grade	20	Backhoes, concrete trucks, compactors, and concrete pump truck	15	
10	Floor slabs, ramps, and roof	20	Concrete trucks and concrete pump truck	10	
11	Rough-in electrical, mechanical, plumbing, communication	160	Scissor lifts and forklifts	25	
12	Precast panels, doors, and windows	40	Scissor lifts, forklifts, and crane	3	
13	Complete electrical, mechanical, plumbing, communications	80	Scissor lifts and forklifts	5	
14	Finishing and commissioning	80	Scissor lifts and forklifts	3	
15	Transition to new facility	20	Forklifts	0	
PHASE II (construction in the footprint of the existing building)					
16	Demolition	12	Excavators, dump trucks, jack hammers, and compressor	20	
17	Excavation and site preparation	12	Backhoes, excavators, dump trucks, jack hammers, and compressors	10	
18	Sound barrier & light poles (remediation, if needed)	12	Crane and concrete trucks	15	
19	Spread footings	24	Concrete pump truck and concrete trucks	20	
20	Structural Steel, metal decks	40	Crane and forklifts	15	
21	Storm sewer, backfill and slab on grade	20	Backhoes, concrete trucks, compactors, and concrete pump truck	15	
22	Floor slabs, ramps, and roof	20	Concrete trucks and concrete pump truck	10	
23	Rough-in electrical, mechanical, plumbing, communication	40	Scissor lifts and forklifts	15	
24	Precast panels, doors, and windows	20	Scissor lifts, forklifts, and crane	3	
25	Complete electrical, mechanical, plumbing, communications	40	Scissor lifts and forklifts	5	
26	Finishing and commissioning	40	Scissor lifts and forklifts	3	
	Total Number of Workers				*10 10 12 22 46 24 24 24 44 60 60 80 80 80* ***280 280 280*** *240 180 260 80 160 160 160 160 160 160 80 80 20 24 24 24 36 60 24 24 24 84 80 160 160 120 40*
	Total Number of Truck Trips				*0 0 10 10 30 20 20 20 22 17 17 32 32 40* ***68 68 68*** *53 35 40 5 8 8 8 8 8 8 3 3 0 30 30 30 45 65 20 20 20 50 40 46 36 21 3*

RECONSTRUCTION OF JAMAICA BUS DEPOT
DESIGN OPTION D - 48 MONTHS

Item	Task	Peak Crew Size	On-site Equipment	# Trucks per Peak Day	Month
					1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
PHASE 0 (Design and mobilization)					
1	Preliminary design				
2	Final design				
3	Mobilization	10			
PHASE I (Construction of new JBD along Merrick Boulevard)					
4	Excavation and site preparation	12	Backhoes, excavators, dump trucks, jack hammers, and compressors	10	
5	Remediation (if needed)	10	TBD		
6	Spread footings	24	Concrete pump truck and concrete trucks	20	
7	Storage Tanks, Utilities (electric, gas, water, telephone services, plumbing)	20	Excavator	2	
8	Structural Steel, metal decks	40	Crane and forklifts	15	
9	Backfill and slab on grade	20	Backhoes, concrete trucks, compactors, and concrete pump truck	15	
10	Floor slabs, ramps, and roof	20	Concrete trucks and concrete pump truck	10	
11	Rough-in electrical, mechanical, plumbing, communication	160	Scissor lifts and forklifts	25	
12	Precast panels, doors, and windows	40	Scissor lifts, forklifts, and crane	3	
13	Complete electrical, mechanical, plumbing, communications	80	Scissor lifts and forklifts	5	
14	Finishing and commissioning	80	Scissor lifts and forklifts	3	
15	Transition to new facility	20	Forklifts	0	
PHASE II (Construction in the footprint of the existing building)					
16	Demolition	12	Excavators, dump trucks, jack hammers, and compressor	20	
17	Excavation and site preparation	12	Backhoes, excavators, dump trucks, jack hammers, and compressors	10	
18	Sound barrier (remediation, if needed)	12	Crane and concrete trucks	15	
19	Spread footings	24	Concrete pump truck and concrete trucks	20	
20	Structural Steel, metal decks	40	Crane and forklifts	15	
21	Storm sewer, backfill and slab on grade	20	Backhoes, concrete trucks, compactors, and concrete pump truck	15	
22	Floor slabs, ramps, and roof	20	Concrete trucks and concrete pump truck	10	
23	Rough-in electrical, mechanical, plumbing, communication	40	Scissor lifts and forklifts	15	
24	Precast panels, doors, and windows	20	Scissor lifts, forklifts, and crane	3	
25	Complete electrical, mechanical, plumbing, communications	40	Scissor lifts and forklifts	5	
26	Finishing and commissioning	40	Scissor lifts and forklifts	3	
	Total Number of Workers				*10 10 12 22 46 24 24 24 44 60 60 80 80 80* ***280 280 280*** *240 180 260 80 160 160 160 160 160 160 80 80 20 24 24 24 36 60 24 24 24 84 80 80 160 160 160 80 40*
	Total Number of Truck Trips				*0 0 10 10 30 20 20 20 22 17 17 32 32 40* ***68 68 68*** *53 35 40 5 8 8 8 8 8 8 3 3 0 30 30 30 45 65 20 20 20 50 40 40 48 48 48 8 3*

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LOS (Level of Service) Tables

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2018 Existing Conditions (Construction Scenario)

INTERSECTION & APPROACH		Mvt.	AM Peak Hour			PM Peak Hour		
			V/C	Control Delay	LOS	V/C	Control Delay	LOS
Signalized								
165th Street and Archer Avenue								
Archer Avenue	EB	L	0.03	13.7	B	0.10	14.6	B
		TR	0.45	19.0	B	0.89	38.4	D
	WB	LTR	0.33	36.4	D	0.45	20.4	C
165th Street	NB	LTR	0.56	23.0	C	0.41	19.6	B
	SB	LTR	0.07	15.1	B	0.22	16.8	B
Overall Intersection		**-**		**26.7**	**C**		**27.6**	**C**
165th Street and Liberty Avenue								
Liberty Avenue	EB	L	0.19	10.8	B	0.25	22.2	C
		TR	0.33	9.3	A	0.68	23.6	C
	WB	L	0.06	12.0	B	0.48	24.3	C
		TR	0.61	16.7	B	0.54	15.7	B
165th Street	NB	LT	0.36	12.3	B	0.22	10.8	B
		R	0.14	10.1	B	0.25	11.1	B
	SB	LTR	0.15	10.3	B	0.30	11.5	B
Overall Intersection		**-**		**13.8**	**B**		**17.7**	**B**
168th Street and Archer Avenue/93rd Avenue								
Archer Avenue/93rd Avenue	EB	LT	0.23	11.3	B	0.50	14.2	B
	WB	TR	0.09	10.2	B	0.15	10.6	B
168th Street	NB	L	0.62	21.0	C	0.45	17.1	B
		TR	0.46	14.5	B	0.35	13.3	B
	SB	LR	0.12	11.8	B	0.42	15.3	B
Overall Intersection		**-**		**14.8**	**B**		**13.9**	**B**
168th Street and Liberty Avenue								
Liberty Avenue	EB	L	0.39	42.3	D	0.53	9.8	A
		T	0.19	34.8	C	0.44	2.3	A
	WB	TR	0.52	19.5	B	0.55	19.8	B
168th Street	NB	LTR	0.84	29.0	C	0.56	20.4	C
Overall Intersection		**-**		**27.1**	**C**		**14.1**	**B**
Merrick Boulevard and 107th Avenue								
107th Avenue	EB	LR	0.36	27.0	C	0.09	21.6	C
Merrick Boulevard	NB	L	0.23	10.9	B	0.25	13.9	B
		T	0.54	13.4	B	0.39	11.6	B
	SB	TR	0.26	10.3	B	0.67	15.8	B
Overall Intersection		**-**		**13.3**	**B**		**14.4**	**B**

INTERSECTION & APPROACH		Mvt.	AM Peak Hour			PM Peak Hour		
			V/C	Control Delay	LOS	V/C	Control Delay	LOS
Merrick Boulevard and Archer Avenue								
Archer Avenue	EB	TR	0.28	20.0	C	0.55	31.7	C
	WB	LT	0.39	17.8	B	0.66	24.1	C
Merrick Boulevard	SB	LTR	0.19	15.6	B	0.49	19.1	B
Overall Intersection		**-**		**18.1**	**B**		**25.3**	**C**
Merrick Boulevard and Liberty Avenue								
Liberty Avenue	EB	T	0.38	24.0	C	0.73	30.8	C
		R	0.25	23.2	C	0.58	29.8	C
	WB	L	0.17	22.4	C	0.61	24.0	C
		T	0.62	26.5	C	0.55	8.9	A
Merrick Boulevard	SB	LTR	0.32	17.5	B	0.75	25.5	C
Overall Intersection		**-**		**23.8**	**C**		**22.6**	**C**
Unsignalized								
165th Street and Tuskegee Airmen Way								
Tuskegee Airmen Way	EB	L	0.24	13.3	B	0.42	14.7	B
	WB	TR	0.07	11.8	B	0.14	11.9	B
165th Street	NB	LT	0.02	1.2	A	0.01	1.6	A
	SB	R	0.03	0.0	A	0.11	0.0	A
Overall Intersection		**-**		**5.7**	**A**		**8.4**	**A**

1 "Mvt." refers to the specific intersection approach lane(s) and how the lane(s) operate and/or specific pavement striping. TR is a combined through- right turn lane(s), R or L refers to exclusive right- or left-turn movement lane(s), and LTR is a mixed lane(s) that allows for all movement types.

2 V/C is the volume-to-capacity ratio for the Mvt. listed in the first column. Values above 1.0 indicate an excess of demand over capacity.

3 Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group listed in the Mvt. Column as noted in the 2000 HCM - TRB.

4 The delay calculations for signalized intersections represent the average control delay experienced by all vehicles that arrive in the analysis period, including delays incurred beyond the analysis period when the lane group is saturated.

5 LOS for unsignalized intersections is based upon total average delay per vehicle (sec/veh) for each lane group listed in the Mvt. column as noted in the 2000 HCM -TRB.

2022 No Build Conditions (Construction Scenario)

INTERSECTION & APPROACH		Mvt.	AM Peak Hour			PM Peak Hour		
			V/C	Control Delay	LOS	V/C	Control Delay	LOS
Signalized								
165th Street and Archer Avenue								
Archer Avenue	EB	L	0.03	13.7	B	0.11	14.7	B
		TR	0.48	19.6	B	0.93	44.0	D
	WB	LTR	0.35	36.7	D	0.50	20.7	C
165th Street	NB	LTR	0.58	23.6	C	0.43	19.9	B
	SB	LTR	0.07	15.1	B	0.22	16.9	B
Overall Intersection		**-**		**27.2**	**C**		**30.2**	**C**
165th Street and Liberty Avenue								
Liberty Avenue	EB	L	0.21	11.4	B	0.27	22.7	C
		TR	0.33	9.4	A	0.69	24.0	C
	WB	L	0.06	12.0	B	0.51	26.1	C
		TR	0.63	17.1	B	0.55	15.8	B
165th Street	NB	LT	0.37	12.5	B	0.23	10.8	B
		R	0.15	10.2	B	0.26	11.2	B
	SB	LTR	0.16	10.3	B	0.31	11.6	B
Overall Intersection		**-**		**14.0**	**B**		**18.0**	**B**
168th Street and Archer Avenue/93rd Avenue								
Archer Avenue/93rd Avenue	EB	LT	0.25	11.5	B	0.54	14.8	B
	WB	TR	0.10	10.2	B	0.16	10.6	B
168th Street	NB	L	0.66	22.5	C	0.49	18.1	B
		TR	0.48	14.7	B	0.38	13.7	B
	SB	LR	0.14	11.9	B	0.47	16.0	B
Overall Intersection		**-**		**15.2**	**B**		**14.4**	**B**
168th Street and Liberty Avenue								
Liberty Avenue	EB	L	0.41	43.1	D	0.56	11.2	B
		T	0.20	34.7	C	0.45	2.3	A
	WB	TR	0.53	19.7	B	0.56	20.0	B
168th Street	NB	LTR	0.88	31.6	C	0.60	21.1	C
Overall Intersection		**-**		**28.4**	**C**		**14.6**	**B**
Merrick Boulevard and 107th Avenue								
107th Avenue	EB	LR	0.37	27.3	C	0.10	21.7	C
Merrick Boulevard	NB	L	0.24	11.0	B	0.27	14.4	B
		T	0.57	13.8	B	0.42	11.9	B
	SB	TR	0.27	10.4	B	0.69	16.2	B
Overall Intersection		**-**		**13.6**	**B**		**14.7**	**B**

INTERSECTION & APPROACH		Mvt.	AM Peak Hour			PM Peak Hour		
			V/C	Control Delay	LOS	V/C	Control Delay	LOS
Merrick Boulevard and Archer Avenue								
Archer Avenue	EB	TR	0.30	20.2	C	0.57	31.9	C
	WB	LT	0.42	18.2	B	0.72	25.9	C
Merrick Boulevard	SB	LTR	0.20	15.6	B	0.50	19.3	B
Overall Intersection		**-**		**18.3**	**B**		**26.0**	**C**
Merrick Boulevard and Liberty Avenue								
Liberty Avenue	EB	T	0.39	24.1	C	0.74	31.3	C
		R	0.26	23.3	C	0.59	30.1	C
	WB	L	0.17	22.7	C	0.64	25.2	C
		T	0.64	26.8	C	0.56	8.9	A
Merrick Boulevard	SB	LTR	0.33	17.6	B	0.77	26.1	C
Overall Intersection		**-**		**24.0**	**C**		**23.0**	**C**
Unsignalized								
165th Street and Tuskegee Airmen Way								
Tuskegee Airmen Way	EB	L	0.25	13.5	B	0.44	15.1	C
	WB	TR	0.07	11.9	B	0.14	12.0	B
165th Street	NB	LT	0.02	1.2	A	0.01	1.7	A
	SB	R	0.03	0.0	A	0.11	0.0	A
Overall Intersection		**-**		**5.8**	**A**		**8.6**	**A**

2022 Build Conditions (Construction Scenario)

INTERSECTION & APPROACH		Mvt.	AM Peak Hour			PM Peak Hour		
			V/C	Control Delay	LOS	V/C	Control Delay	LOS
Signalized								
165th Street and Archer Avenue								
Archer Avenue	EB	L	0.03	13.7	B	0.11	14.6	B
		TR	0.51	20.2	C	0.93	44.2	D
	WB	LTR	0.32	36.1	D	0.48	20.5	C
165th Street	NB	LTR	0.58	23.6	C	0.43	19.9	B
	SB	LTR	0.07	15.1	B	0.22	16.9	B
Overall Intersection		**-**		**26.7**	**C**		**30.4**	**C**
165th Street and Liberty Avenue								
Liberty Avenue	EB	L	0.21	11.7	B	0.28	22.9	C
		TR	0.36	10.0	A	0.69	24.0	C
	WB	L	0.06	12.1	B	0.51	26.4	C
		TR	0.63	17.1	B	0.56	15.9	B
165th Street	NB	LT	0.37	12.5	B	0.23	10.9	B
		R	0.15	10.2	B	0.27	11.3	B
	SB	LTR	0.16	10.3	B	0.31	11.6	B
Overall Intersection		**-**		**14.0**	**B**		**18.0**	**B**
168th Street and Archer Avenue/93rd Avenue								
Archer Avenue/93rd Avenue	EB	LT	0.25	11.5	B	0.54	14.8	B
	WB	TR	0.10	10.2	B	0.16	10.6	B
168th Street	NB	L	0.58	19.9	B	0.44	17.0	B
		TR	0.49	14.8	B	0.39	13.7	B
	SB	LR	0.14	11.9	B	0.47	16.0	B
Overall Intersection		**-**		**14.6**	**B**		**14.3**	**B**
168th Street and Liberty Avenue								
Liberty Avenue	EB	L	0.45	44.9	D	0.57	11.3	B
		T	0.20	34.7	C	0.45	2.3	A
	WB	TR	0.57	20.3	C	0.56	20.1	C
168th Street	NB	LTR	0.86	30.5	C	0.64	22.0	C
Overall Intersection		**-**		**28.0**	**C**		**15.0**	**B**
Merrick Boulevard and 107th Avenue								
107th Avenue	EB	LR	0.05	21.4	C	0.08	21.6	C
Merrick Boulevard	NB	L	0.23	11.0	B	0.18	12.4	B
		T	0.61	14.5	B	0.42	11.9	B
	SB	TR	0.28	10.5	B	0.72	17.0	B
Overall Intersection		**-**		**13.3**	**B**		**15.2**	**B**

INTERSECTION & APPROACH		Mvt.	AM Peak Hour			PM Peak Hour		
			V/C	Control Delay	LOS	V/C	Control Delay	LOS
Merrick Boulevard and Archer Avenue								
Archer Avenue	EB	TR	0.32	20.5	C	0.57	32.0	C
	WB	LT	0.39	17.9	B	0.70	25.2	C
Merrick Boulevard	SB	LTR	0.21	15.7	B	0.50	19.3	B
Overall Intersection		**-**		**18.3**	**B**		**25.8**	**C**
Merrick Boulevard and Liberty Avenue								
Liberty Avenue	EB	T	0.39	24.1	C	0.75	31.4	C
		R	0.32	24.3	C	0.60	30.5	C
	WB	L	0.31	24.9	C	0.67	27.1	C
		T	0.64	26.9	C	0.57	9.2	A
Merrick Boulevard	SB	LTR	0.36	18.0	B	0.77	26.2	C
Overall Intersection		**-**		**24.1**	**C**		**23.3**	**C**
Unsignalized								
165th Street and Tuskegee Airmen Way								
Tuskegee Airmen Way	EB	L	0.25	13.5	B	0.45	15.8	C
	WB	TR	0.07	11.9	B	0.14	12.0	B
165th Street	NB	LT	0.02	1.2	A	0.01	1.7	A
	SB	R	0.03	0.0	A	0.11	0.0	A
Overall Intersection		**-**		**5.8**	**A**		**8.8**	**A**

2018 Existing Condition Traffic Network

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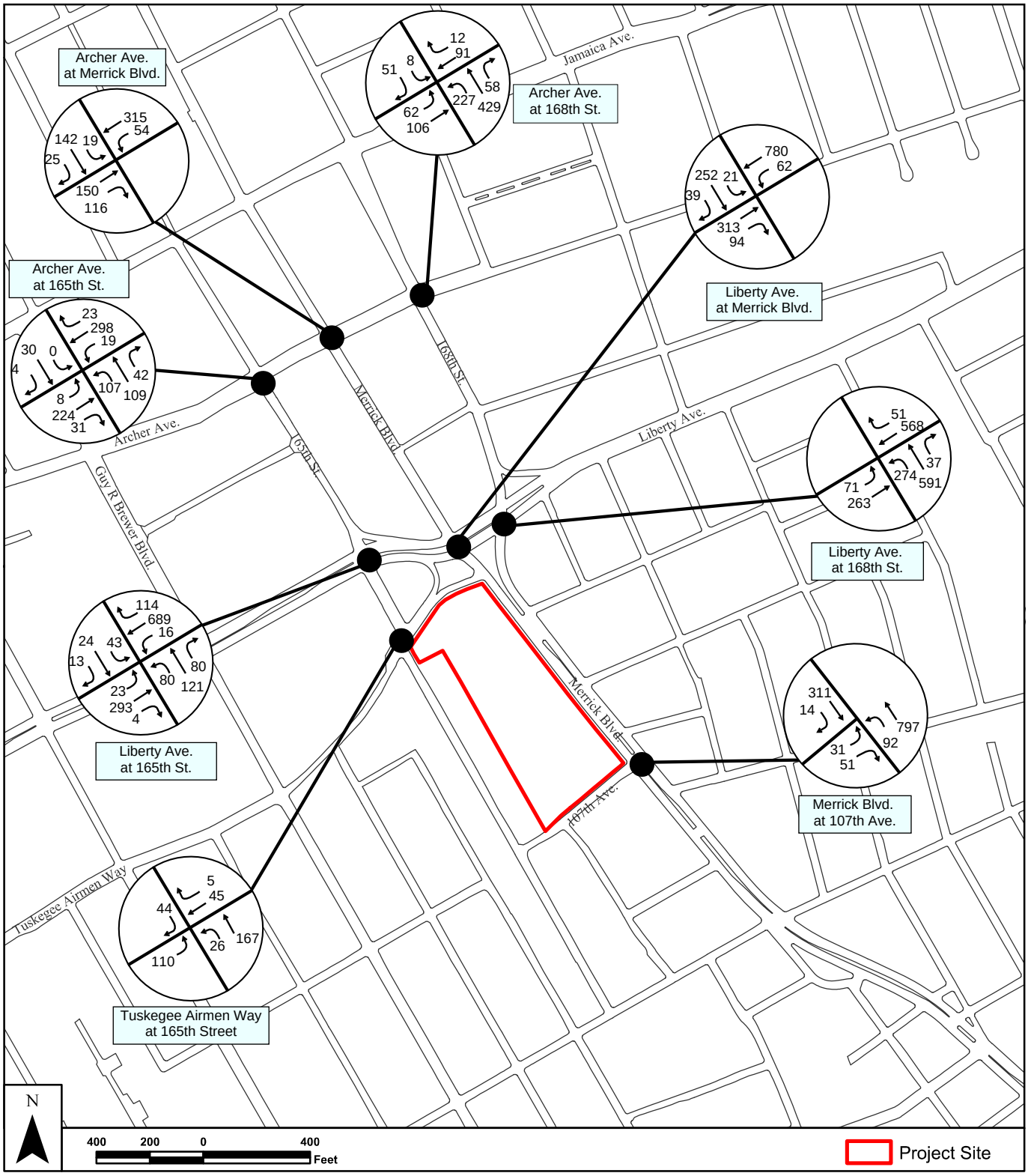
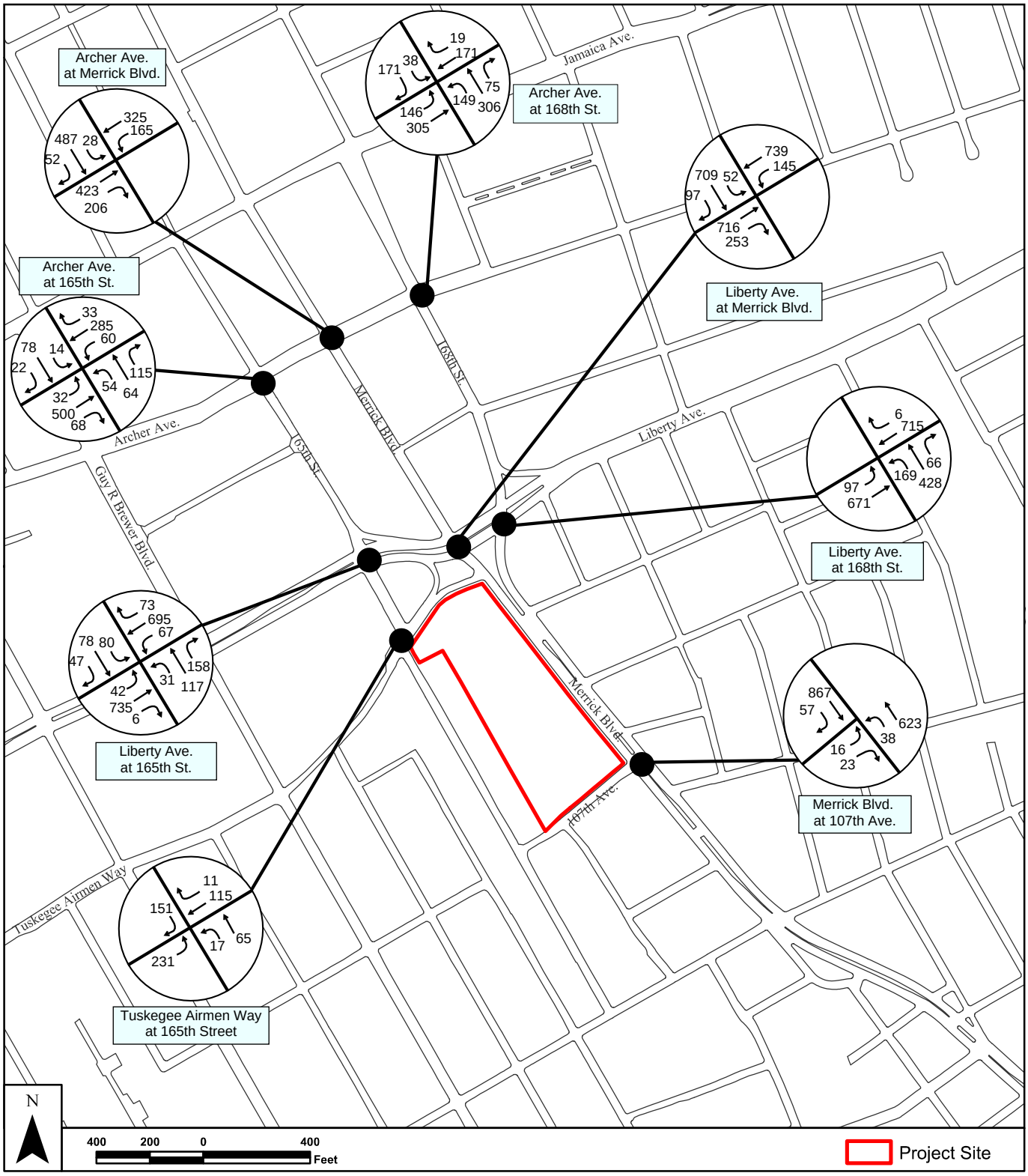


Source: STV Incorporated, 2019.

Figure G-1

EXISTING CONDITION TRAFFIC VOLUME
CONSTRUCTION AM PEAK HOUR



Source: STV Incorporated, 2019.

Figure G-2

EXISTING CONDITION TRAFFIC VOLUME
CONSTRUCTION PM PEAK HOUR

2022 No-Build Condition Traffic Network

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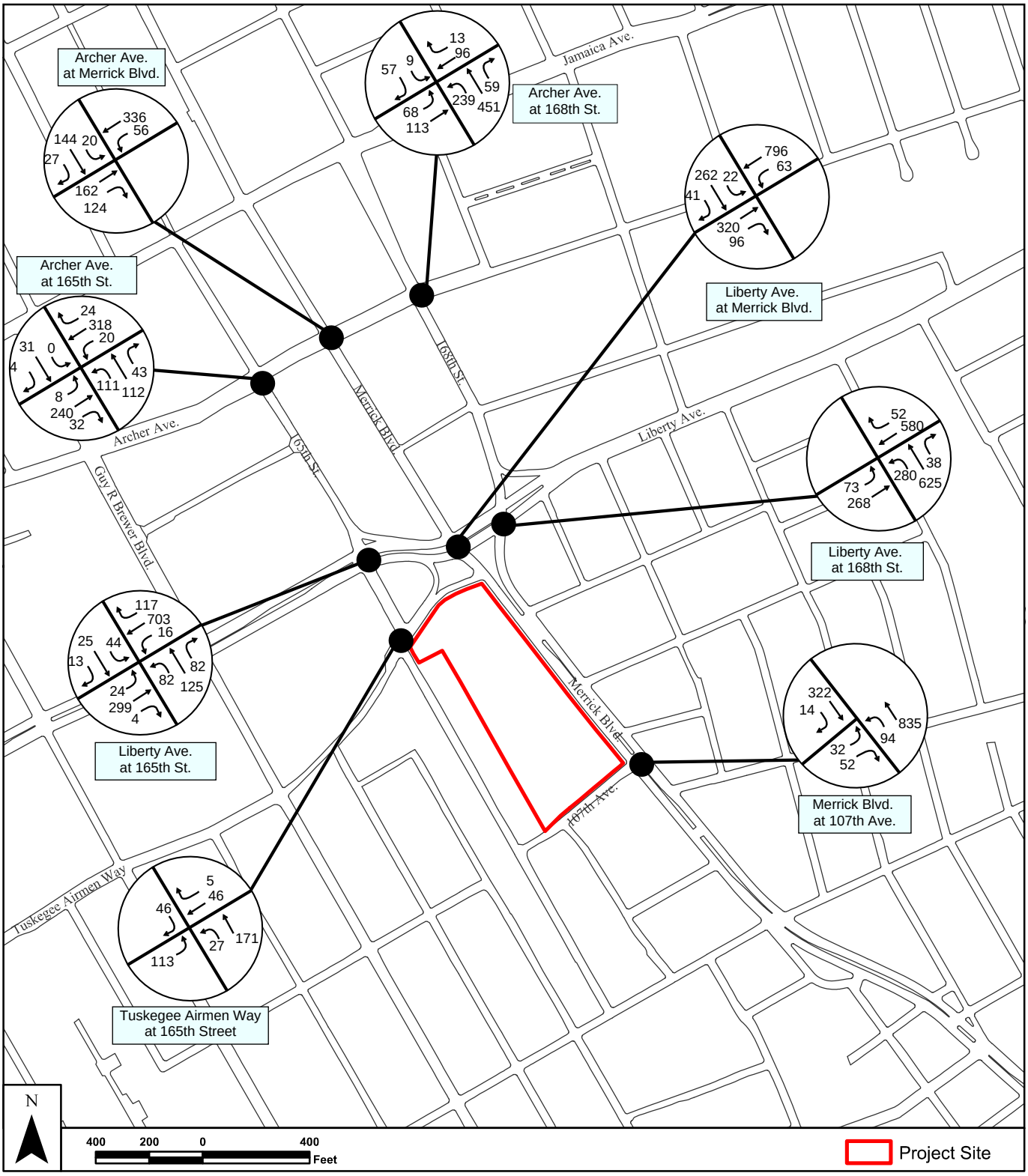
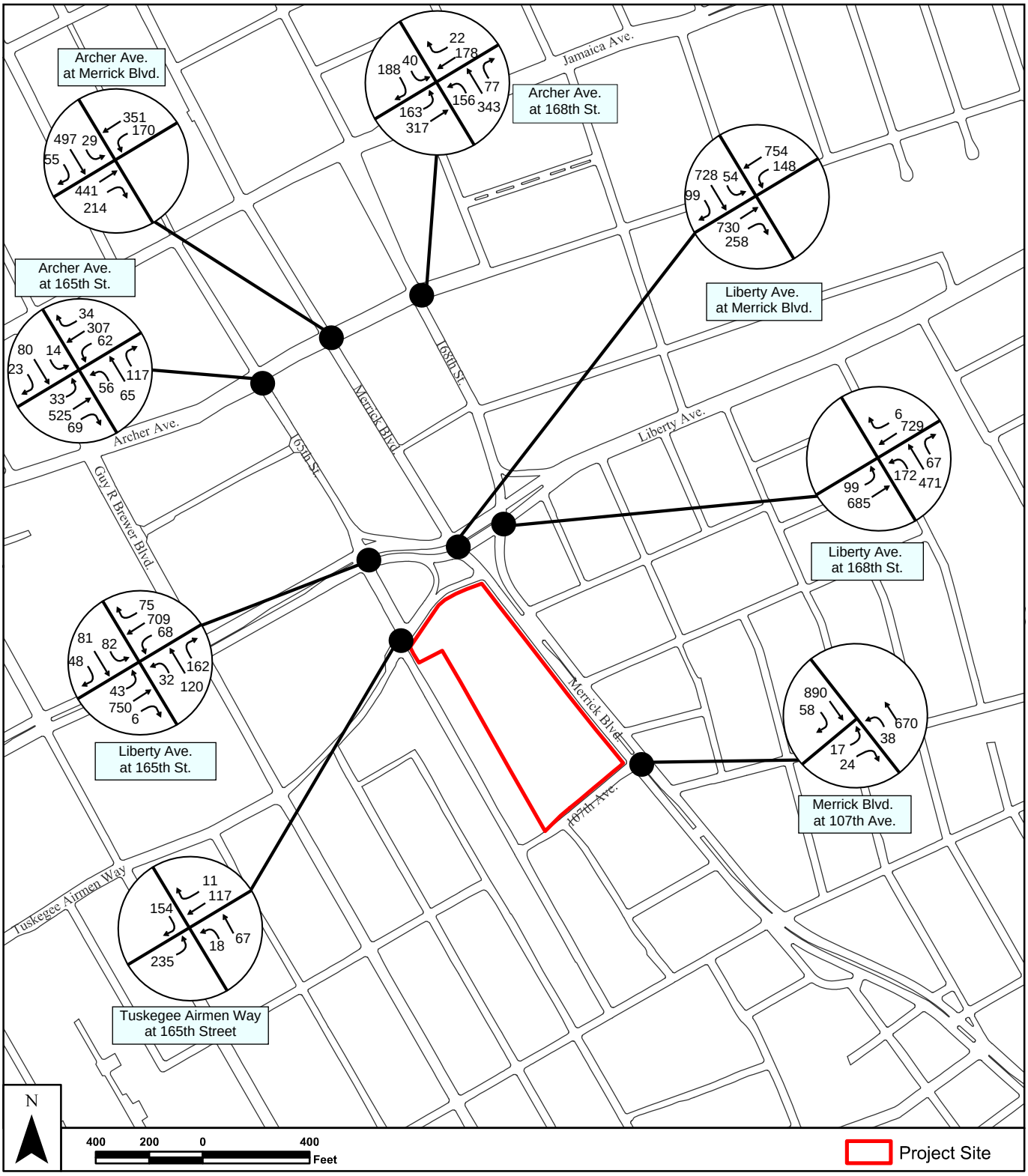


Source: STV Incorporated, 2019.

Figure G-3

NO-BUILD CONDITION TRAFFIC VOLUME
CONSTRUCTION AM PEAK HOUR

Reconstruction and Expansion of Jamaica Bus Depot



Source: STV Incorporated

Figure G-4

NO-BUILD CONDITION TRAFFIC VOLUME
CONSTRUCTION PM PEAK HOUR

2022 Construction Condition Traffic Network

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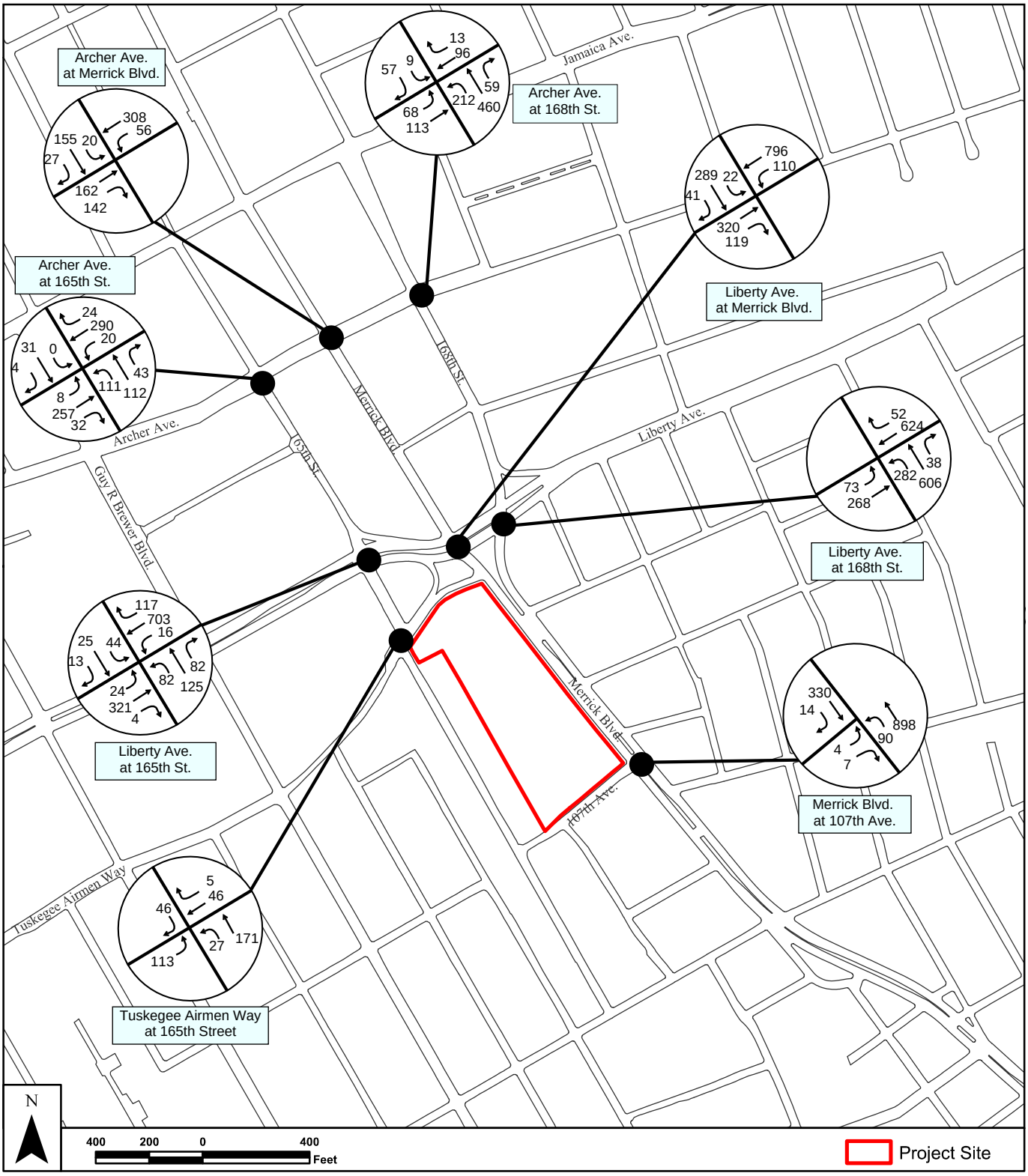
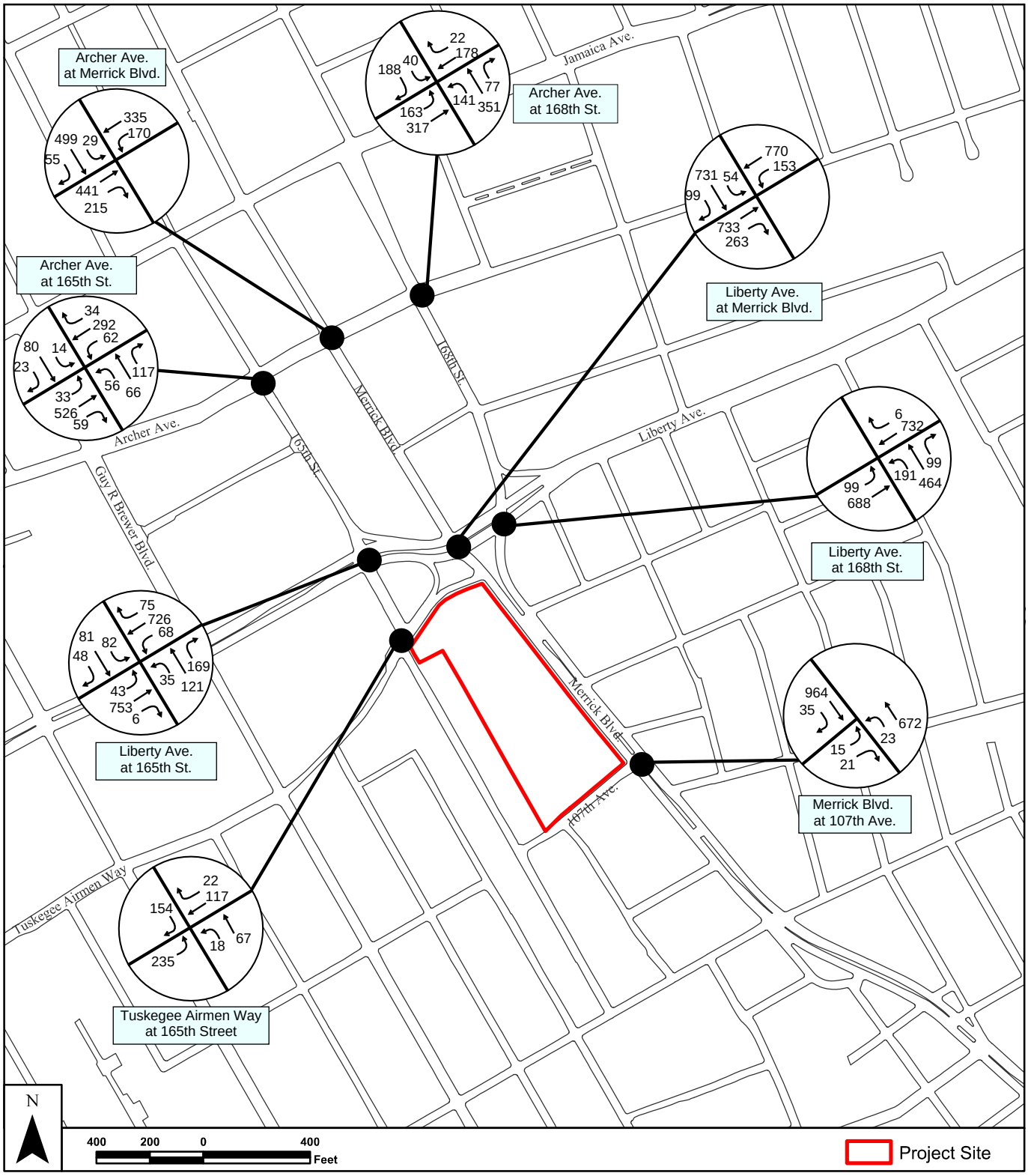


Source: STV Incorporated, 2019.

Figure G-5

FUTURE WITH THE PROPOSED ACTION CONDITION TRAFFIC VOLUME CONSTRUCTION AM PEAK HOUR



Source: STV Incorporated, 2019.

Figure G-5

FUTURE WITH THE PROPOSED ACTION CONDITION TRAFFIC VOLUME
CONSTRUCTION PM PEAK HOUR

Synchro Analysis

AM Existing 2018

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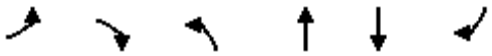
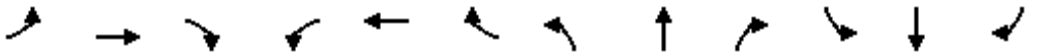


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	31	51	92	797	311	14
Future Volume (vph)	31	51	92	797	311	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.92		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	867		1490	3025	2651	
Flt Permitted	0.98		0.52	1.00	1.00	
Satd. Flow (perm)	867		816	3025	2651	
Peak-hour factor, PHF	0.81	0.81	0.86	0.86	0.83	0.83
Adj. Flow (vph)	38	63	107	927	375	17
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	101	0	107	927	392	0
Heavy Vehicles (%)	86%	86%	9%	9%	19%	19%
Parking (#/hr)	3	3		2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	279		462	1714	1502	
v/s Ratio Prot	c0.12			c0.31	0.15	
v/s Ratio Perm			0.13			
v/c Ratio	0.36		0.23	0.54	0.26	
Uniform Delay, d1	23.4		9.7	12.2	9.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.6		1.2	1.2	0.4	
Delay (s)	27.0		10.9	13.4	10.3	
Level of Service	C		B	B	B	
Approach Delay (s)	27.0			13.2	10.3	
Approach LOS	C			B	B	

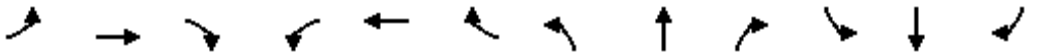
Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	109.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



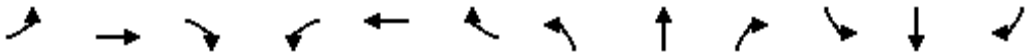
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	313	94	62	780	0	0	0	0	21	252	39
Future Volume (vph)	0	313	94	62	780	0	0	0	0	21	252	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.98	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		2983	1334	1583	3192						2754	
Flt Permitted		1.00	1.00	0.49	1.00						1.00	
Satd. Flow (perm)		2983	1334	819	3192						2754	
Peak-hour factor, PHF	0.83	0.83	0.83	0.86	0.86	0.86	0.92	0.92	0.92	0.82	0.82	0.82
Adj. Flow (vph)	0	377	113	72	907	0	0	0	0	26	307	48
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	377	113	72	907	0	0	0	0	0	381	0
Heavy Vehicles (%)	17%	17%	17%	14%	14%	14%	2%	2%	2%	15%	15%	15%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2					3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		994	444	424	1454						1193	
v/s Ratio Prot		0.13		0.01	c0.28							
v/s Ratio Perm			0.08	0.07							0.14	
v/c Ratio		0.38	0.25	0.17	0.62						0.32	
Uniform Delay, d1		22.9	21.9	16.0	18.6						16.8	
Progression Factor		1.00	1.00	1.36	1.33						1.00	
Incremental Delay, d2		1.1	1.4	0.7	1.6						0.7	
Delay (s)		24.0	23.2	22.4	26.5						17.5	
Level of Service		C	C	C	C						B	
Approach Delay (s)		23.8			26.2			0.0			17.5	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



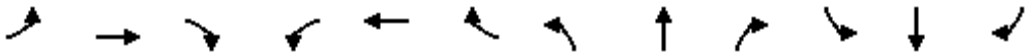
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	293	4	16	689	106	80	121	80	43	24	13
Future Volume (vph)	23	293	4	16	689	106	80	121	80	43	24	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.98			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.97	
Satd. Flow (prot)	1466	2853		1465	3947			1748	1516		1768	
Flt Permitted	0.25	1.00		0.54	1.00			0.85	1.00		0.78	
Satd. Flow (perm)	387	2853		829	3947			1512	1516		1423	
Peak-hour factor, PHF	0.83	0.83	0.83	0.86	0.86	0.86	0.82	0.82	0.82	0.81	0.81	0.81
Adj. Flow (vph)	28	353	5	19	801	123	98	148	98	53	30	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	28	358	0	19	924	0	0	246	98	0	99	0
Heavy Vehicles (%)	19%	19%	19%	15%	15%	15%	3%	3%	3%	16%	16%	16%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	148	1093		317	1513			680	682		640	
v/s Ratio Prot		0.13			c0.23							
v/s Ratio Perm	0.07			0.02				c0.16	0.06		0.07	
v/c Ratio	0.19	0.33		0.06	0.61			0.36	0.14		0.15	
Uniform Delay, d1	12.3	13.0		11.7	14.9			10.8	9.7		9.8	
Progression Factor	0.66	0.66		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	2.7	0.8		0.4	1.8			1.5	0.4		0.5	
Delay (s)	10.8	9.3		12.0	16.7			12.3	10.1		10.3	
Level of Service	B	A		B	B			B	B		B	
Approach Delay (s)		9.5			16.6			11.7			10.3	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



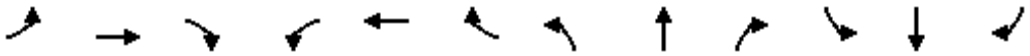
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	263	0	0	568	51	274	591	37	0	0	0
Future Volume (vph)	71	263	0	0	568	51	274	591	37	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			0.99			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1504	3438			3137			2785				
Flt Permitted	0.30	1.00			1.00			0.99				
Satd. Flow (perm)	467	3438			3137			2785				
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	80	296	0	0	668	60	315	679	43	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	80	296	0	0	728	0	0	1037	0	0	0	0
Heavy Vehicles (%)	12%	12%	12%	11%	11%	11%	12%	12%	12%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	207	1528			1394			1237				
v/s Ratio Prot		0.09			c0.23							
v/s Ratio Perm	0.17							0.37				
v/c Ratio	0.39	0.19			0.52			0.84				
Uniform Delay, d1	16.8	15.2			18.1			22.1				
Progression Factor	2.22	2.27			1.00			1.00				
Incremental Delay, d2	5.1	0.3			1.4			6.9				
Delay (s)	42.3	34.8			19.5			29.0				
Level of Service	D	C			B			C				
Approach Delay (s)		36.4			19.5			29.0			0.0	
Approach LOS		D			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



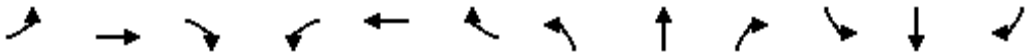
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	224	31	19	298	23	107	109	42	0	30	4
Future Volume (vph)	8	224	31	19	298	23	107	109	42	0	30	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.98			0.99			0.98			0.98	
Flt Protected	0.95	1.00			1.00			0.98			1.00	
Satd. Flow (prot)	1374	1420			2944			1491			1388	
Flt Permitted	0.49	1.00			0.93			0.85			1.00	
Satd. Flow (perm)	709	1420			2739			1297			1388	
Peak-hour factor, PHF	0.88	0.88	0.88	0.83	0.83	0.83	0.82	0.82	0.82	0.81	0.81	0.81
Adj. Flow (vph)	9	255	35	23	359	28	130	133	51	0	37	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	9	290	0	0	410	0	0	314	0	0	42	0
Heavy Vehicles (%)	27%	27%	27%	17%	17%	17%	18%	18%	18%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)											3	3
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	322	646			1247			562			601	
v/s Ratio Prot		c0.20									0.03	
v/s Ratio Perm	0.01				0.15			c0.24				
v/c Ratio	0.03	0.45			0.33			0.56			0.07	
Uniform Delay, d1	13.5	16.8			15.7			19.1			14.9	
Progression Factor	1.00	1.00			2.28			1.00			1.00	
Incremental Delay, d2	0.2	2.2			0.7			4.0			0.2	
Delay (s)	13.7	19.0			36.4			23.0			15.1	
Level of Service	B	B			D			C			B	
Approach Delay (s)		18.9			36.4			23.0			15.1	
Approach LOS		B			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	106	0	0	91	12	227	429	58	8	0	51
Future Volume (vph)	62	106	0	0	91	12	227	429	58	8	0	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.98			0.88	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2364			3182		1439	3111			1588	
Flt Permitted		0.82			1.00		0.71	1.00			0.92	
Satd. Flow (perm)		1983			3182		1075	3111			1473	
Peak-hour factor, PHF	0.86	0.86	0.86	0.81	0.81	0.81	0.85	0.85	0.85	0.81	0.81	0.81
Adj. Flow (vph)	72	123	0	0	112	15	267	505	68	10	0	63
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	195	0	0	127	0	267	573	0	0	73	0
Heavy Vehicles (%)	31%	31%	31%	4%	4%	4%	11%	11%	11%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		859			1378		430	1244			589	
v/s Ratio Prot					0.04			0.18				
v/s Ratio Perm		c0.10					c0.25				0.05	
v/c Ratio		0.23			0.09		0.62	0.46			0.12	
Uniform Delay, d1		10.7			10.0		14.4	13.2			11.4	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.6			0.1		6.6	1.2			0.4	
Delay (s)		11.3			10.2		21.0	14.5			11.8	
Level of Service		B			B		C	B			B	
Approach Delay (s)		11.3			10.2			16.5			11.8	
Approach LOS		B			B			B			B	

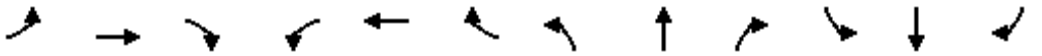
Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	150	116	54	315	0	0	0	0	19	142	25
Future Volume (vph)	0	150	116	54	315	0	0	0	0	19	142	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.93			1.00						0.98	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		2519			2987						2444	
Flt Permitted		1.00			0.85						1.00	
Satd. Flow (perm)		2519			2559						2444	
Peak-hour factor, PHF	0.85	0.85	0.85	0.83	0.83	0.83	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	0	176	136	65	380	0	0	0	0	21	160	28
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	312	0	0	445	0	0	0	0	0	209	0
Heavy Vehicles (%)	25%	25%	25%	12%	12%	12%	2%	2%	2%	27%	27%	27%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1119			1137						1086	
v/s Ratio Prot		0.12										
v/s Ratio Perm					c0.17						0.09	
v/c Ratio		0.28			0.39						0.19	
Uniform Delay, d1		15.9			16.8						15.2	
Progression Factor		1.23			1.00						1.00	
Incremental Delay, d2		0.6			1.0						0.4	
Delay (s)		20.0			17.8						15.6	
Level of Service		C			B						B	
Approach Delay (s)		20.0			17.8			0.0			15.6	
Approach LOS		C			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	0	0	0	45	5	26	167	0	0	0	44
Future Volume (Veh/h)	110	0	0	0	45	5	26	167	0	0	0	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.82	0.82	0.82	0.81	0.81	0.81
Hourly flow rate (vph)	136	0	0	0	56	6	32	204	0	0	0	54
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	302	268	0	295	322	204	54			204		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302	268	0	295	322	204	54			204		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.2			2.2		
p0 queue free %	76	100	100	100	90	99	98			100		
cM capacity (veh/h)	572	610	1059	626	566	810	1545			1380		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	136	37	25	236	54
Volume Left	136	0	0	32	0
Volume Right	0	0	6	0	54
cSH	572	566	610	1545	1700
Volume to Capacity	0.24	0.07	0.04	0.02	0.03
Queue Length 95th (ft)	23	5	3	2	0
Control Delay (s)	13.3	11.8	11.1	1.2	0.0
Lane LOS	B	B	B	A	
Approach Delay (s)	13.3	11.5		1.2	0.0
Approach LOS	B	B			

Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	29.7%	ICU Level of Service		A
Analysis Period (min)	15			

Synchro Analysis

PM Existing 2018

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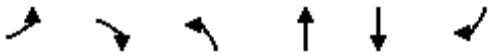
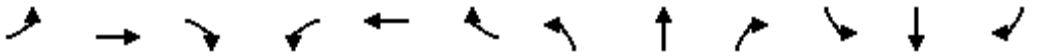


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	16	23	38	623	867	57
Future Volume (vph)	16	23	38	623	867	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.92		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1663		1268	2893	2809	
Flt Permitted	0.98		0.20	1.00	1.00	
Satd. Flow (perm)	1663		271	2893	2809	
Peak-hour factor, PHF	0.81	0.81	0.97	0.97	0.87	0.87
Adj. Flow (vph)	20	28	39	642	997	66
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	48	0	39	642	1063	0
Heavy Vehicles (%)	10%	10%	14%	14%	12%	12%
Parking (#/hr)		3	2	2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	535		153	1639	1591	
v/s Ratio Prot	c0.03			0.22	c0.38	
v/s Ratio Perm			0.14			
v/c Ratio	0.09		0.25	0.39	0.67	
Uniform Delay, d1	21.3		9.9	10.9	13.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		4.0	0.7	2.2	
Delay (s)	21.6		13.9	11.6	15.8	
Level of Service	C		B	B	B	
Approach Delay (s)	21.6			11.7	15.8	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

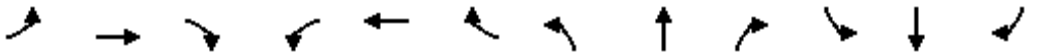
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	716	253	145	739	0	0	0	0	52	709	97
Future Volume (vph)	0	716	253	145	739	0	0	0	0	52	709	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.98	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3202	1432	1641	3308						2912	
Flt Permitted		1.00	1.00	0.23	1.00						1.00	
Satd. Flow (perm)		3202	1432	393	3308						2912	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	0	778	275	161	821	0	0	0	0	57	779	107
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	778	275	161	821	0	0	0	0	0	943	0
Heavy Vehicles (%)	9%	9%	9%	10%	10%	10%	2%	2%	2%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2	2				3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1067	477	262	1506						1261	
v/s Ratio Prot		c0.24		0.04	c0.25							
v/s Ratio Perm			0.19	0.24							0.32	
v/c Ratio		0.73	0.58	0.61	0.55						0.75	
Uniform Delay, d1		26.4	24.8	28.6	17.7						21.4	
Progression Factor		1.00	1.00	0.53	0.43						1.00	
Incremental Delay, d2		4.4	5.0	8.9	1.2						4.1	
Delay (s)		30.8	29.8	24.0	8.9						25.5	
Level of Service		C	C	C	A						C	
Approach Delay (s)		30.5			11.4			0.0			25.5	
Approach LOS		C			B			A			C	

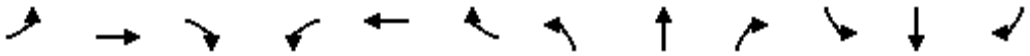
Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	735	6	67	695	73	31	117	158	80	78	47
Future Volume (vph)	42	735	6	67	695	73	31	117	158	80	78	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1601	3117		1532	4151			1782	1531		1913	
Flt Permitted	0.28	1.00		0.25	1.00			0.92	1.00		0.83	
Satd. Flow (perm)	473	3117		404	4151			1649	1531		1624	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.91	0.91	0.91	0.94	0.94	0.94
Adj. Flow (vph)	46	799	7	74	772	81	34	129	174	85	83	50
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	46	806	0	74	853	0	0	163	174	0	218	0
Heavy Vehicles (%)	9%	9%	9%	10%	10%	10%	2%	2%	2%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	181	1194		154	1591			742	688		730	
v/s Ratio Prot		c0.26			0.21							
v/s Ratio Perm	0.10			0.18				0.10	0.11		c0.13	
v/c Ratio	0.25	0.68		0.48	0.54			0.22	0.25		0.30	
Uniform Delay, d1	12.6	15.4		14.0	14.4			10.1	10.2		10.5	
Progression Factor	1.55	1.37		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	2.7	2.5		10.4	1.3			0.7	0.9		1.0	
Delay (s)	22.2	23.6		24.3	15.7			10.8	11.1		11.5	
Level of Service	C	C		C	B			B	B		B	
Approach Delay (s)		23.5			16.4			10.9			11.5	
Approach LOS		C			B			B			B	

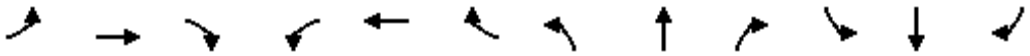
Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	671	0	0	715	6	169	428	66	0	0	0
Future Volume (vph)	97	671	0	0	715	6	169	428	66	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			1.00			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1574	3599			3290			2743				
Flt Permitted	0.26	1.00			1.00			0.99				
Satd. Flow (perm)	430	3599			3290			2743				
Peak-hour factor, PHF	0.95	0.95	0.95	0.90	0.90	0.90	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	102	706	0	0	794	7	174	441	68	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	102	706	0	0	801	0	0	683	0	0	0	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	13%	13%	13%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	191	1599			1462			1219				
v/s Ratio Prot		0.20			c0.24							
v/s Ratio Perm	0.24							0.25				
v/c Ratio	0.53	0.44			0.55			0.56				
Uniform Delay, d1	18.2	17.3			18.4			18.5				
Progression Factor	0.16	0.10			1.00			1.00				
Incremental Delay, d2	7.0	0.6			1.5			1.9				
Delay (s)	9.8	2.3			19.8			20.4				
Level of Service	A	A			B			C				
Approach Delay (s)		3.2			19.8			20.4			0.0	
Approach LOS		A			B			C			A	

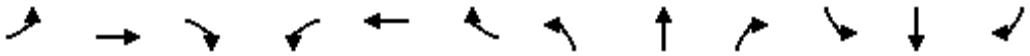
Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



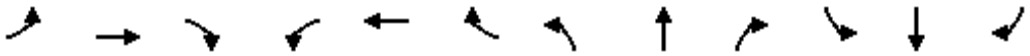
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	500	68	60	285	33	54	64	115	14	78	22
Future Volume (vph)	32	500	68	60	285	33	54	64	115	14	78	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.98			0.99			0.93			0.97	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1504	1555			2946			1555			1379	
Flt Permitted	0.49	1.00			0.67			0.91			0.96	
Satd. Flow (perm)	781	1555			1980			1427			1326	
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	36	556	76	65	306	35	59	70	126	15	85	24
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	36	632	0	0	406	0	0	255	0	0	124	0
Heavy Vehicles (%)	16%	16%	16%	16%	16%	16%	9%	9%	9%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)										3	3	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	355	708			902			618			574	
v/s Ratio Prot		c0.41										
v/s Ratio Perm	0.05				0.21			c0.18			0.09	
v/c Ratio	0.10	0.89			0.45			0.41			0.22	
Uniform Delay, d1	14.0	22.5			16.8			17.6			15.9	
Progression Factor	1.00	1.00			1.14			1.00			1.00	
Incremental Delay, d2	0.6	15.9			1.2			2.0			0.9	
Delay (s)	14.6	38.4			20.4			19.6			16.8	
Level of Service	B	D			C			B			B	
Approach Delay (s)		37.1			20.4			19.6			16.8	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	305	0	0	171	19	149	306	75	38	0	171
Future Volume (vph)	146	305	0	0	171	19	149	306	75	38	0	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.89	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2723			3286		1426	3047			1611	
Flt Permitted		0.77			1.00		0.61	1.00			0.87	
Satd. Flow (perm)		2137			3286		922	3047			1420	
Peak-hour factor, PHF	0.98	0.98	0.98	0.87	0.87	0.87	0.90	0.90	0.90	0.87	0.87	0.87
Adj. Flow (vph)	149	311	0	0	197	22	166	340	83	44	0	197
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	460	0	0	219	0	166	423	0	0	241	0
Heavy Vehicles (%)	14%	14%	14%	1%	1%	1%	12%	12%	12%	4%	4%	4%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		926			1423		368	1218			568	
v/s Ratio Prot					0.07			0.14				
v/s Ratio Perm		c0.22					c0.18				0.17	
v/c Ratio		0.50			0.15		0.45	0.35			0.42	
Uniform Delay, d1		12.3			10.3		13.2	12.5			13.0	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		1.9			0.2		4.0	0.8			2.3	
Delay (s)		14.2			10.6		17.1	13.3			15.3	
Level of Service		B			B		B	B			B	
Approach Delay (s)		14.2			10.6			14.4			15.3	
Approach LOS		B			B			B			B	

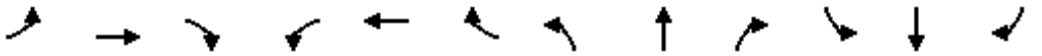
Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	423	206	165	325	0	0	0	0	28	487	52
Future Volume (vph)	0	423	206	165	325	0	0	0	0	28	487	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		2810			3012						2797	
Flt Permitted		1.00			0.58						1.00	
Satd. Flow (perm)		2810			1780						2797	
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	460	224	177	349	0	0	0	0	30	518	55
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	684	0	0	526	0	0	0	0	0	603	0
Heavy Vehicles (%)	14%	14%	14%	10%	10%	10%	2%	2%	2%	12%	12%	12%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1248			791						1243	
v/s Ratio Prot		0.24										
v/s Ratio Perm					c0.30						0.22	
v/c Ratio		0.55			0.66						0.49	
Uniform Delay, d1		18.4			19.7						17.7	
Progression Factor		1.67			1.00						1.00	
Incremental Delay, d2		1.0			4.4						1.4	
Delay (s)		31.7			24.1						19.1	
Level of Service		C			C						B	
Approach Delay (s)		31.7			24.1			0.0			19.1	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	231	0	0	0	115	11	17	65	0	0	0	151
Future Volume (Veh/h)	231	0	0	0	115	11	17	65	0	0	0	151
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.90	0.90	0.90	0.92	0.92	0.92	0.83	0.83	0.83
Hourly flow rate (vph)	269	0	0	0	128	12	18	71	0	0	0	182
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	183	107	0	198	289	71	182			71		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	183	107	0	198	289	71	182			71		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	58	100	100	100	79	99	99			100		
cM capacity (veh/h)	638	773	1085	747	608	983	1369			1504		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	269	85	55	89	182
Volume Left	269	0	0	18	0
Volume Right	0	0	12	0	182
cSH	638	608	664	1369	1700
Volume to Capacity	0.42	0.14	0.08	0.01	0.11
Queue Length 95th (ft)	52	12	7	1	0
Control Delay (s)	14.7	11.9	10.9	1.6	0.0
Lane LOS	B	B	B	A	
Approach Delay (s)	14.7	11.5		1.6	0.0
Approach LOS	B	B			

Intersection Summary				
Average Delay	8.4			
Intersection Capacity Utilization	30.7%	ICU Level of Service		A
Analysis Period (min)	15			

Synchro Analysis

AM No-Build 2022

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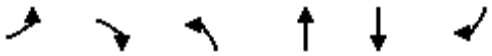
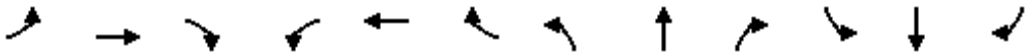


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	32	52	94	835	322	14
Future Volume (vph)	32	52	94	835	322	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.92		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	868		1490	3025	2652	
Flt Permitted	0.98		0.51	1.00	1.00	
Satd. Flow (perm)	868		802	3025	2652	
Peak-hour factor, PHF	0.81	0.81	0.86	0.86	0.83	0.83
Adj. Flow (vph)	40	64	109	971	388	17
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	104	0	109	971	405	0
Heavy Vehicles (%)	86%	86%	9%	9%	19%	19%
Parking (#/hr)	3	3		2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	279		454	1714	1502	
v/s Ratio Prot	c0.12			c0.32	0.15	
v/s Ratio Perm			0.14			
v/c Ratio	0.37		0.24	0.57	0.27	
Uniform Delay, d1	23.5		9.8	12.4	10.0	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.8		1.2	1.4	0.4	
Delay (s)	27.3		11.0	13.8	10.4	
Level of Service	C		B	B	B	
Approach Delay (s)	27.3			13.5	10.4	
Approach LOS	C			B	B	

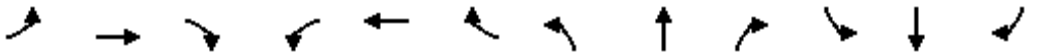
Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	110.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



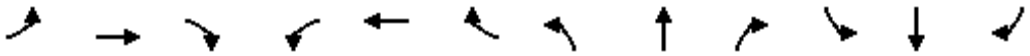
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	320	96	63	796	0	0	0	0	22	262	41
Future Volume (vph)	0	320	96	63	796	0	0	0	0	22	262	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.98	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		2983	1334	1583	3192						2754	
Flt Permitted		1.00	1.00	0.48	1.00						1.00	
Satd. Flow (perm)		2983	1334	807	3192						2754	
Peak-hour factor, PHF	0.83	0.83	0.83	0.86	0.86	0.86	0.92	0.92	0.92	0.82	0.82	0.82
Adj. Flow (vph)	0	386	116	73	926	0	0	0	0	27	320	50
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	386	116	73	926	0	0	0	0	0	397	0
Heavy Vehicles (%)	17%	17%	17%	14%	14%	14%	2%	2%	2%	15%	15%	15%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2					3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		994	444	419	1454						1193	
v/s Ratio Prot		0.13		0.01	c0.29							
v/s Ratio Perm			0.09	0.07							0.14	
v/c Ratio		0.39	0.26	0.17	0.64						0.33	
Uniform Delay, d1		23.0	21.9	16.2	18.8						16.9	
Progression Factor		1.00	1.00	1.36	1.34						1.00	
Incremental Delay, d2		1.1	1.4	0.7	1.6						0.8	
Delay (s)		24.1	23.3	22.7	26.8						17.6	
Level of Service		C	C	C	C						B	
Approach Delay (s)		23.9			26.5			0.0			17.6	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



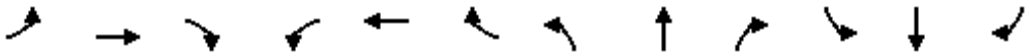
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	299	4	16	703	117	82	125	82	44	25	13
Future Volume (vph)	24	299	4	16	703	117	82	125	82	44	25	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.98			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.97	
Satd. Flow (prot)	1466	2853		1465	3941			1748	1516		1769	
Flt Permitted	0.24	1.00		0.53	1.00			0.85	1.00		0.78	
Satd. Flow (perm)	369	2853		824	3941			1510	1516		1418	
Peak-hour factor, PHF	0.83	0.83	0.83	0.86	0.86	0.86	0.82	0.82	0.82	0.81	0.81	0.81
Adj. Flow (vph)	29	360	5	19	817	136	100	152	100	54	31	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	29	365	0	19	953	0	0	252	100	0	101	0
Heavy Vehicles (%)	19%	19%	19%	15%	15%	15%	3%	3%	3%	16%	16%	16%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	141	1093		315	1510			679	682		638	
v/s Ratio Prot		0.13			c0.24							
v/s Ratio Perm	0.08			0.02				c0.17	0.07		0.07	
v/c Ratio	0.21	0.33		0.06	0.63			0.37	0.15		0.16	
Uniform Delay, d1	12.4	13.1		11.7	15.0			10.9	9.7		9.8	
Progression Factor	0.67	0.66		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	3.1	0.8		0.4	2.0			1.6	0.5		0.5	
Delay (s)	11.4	9.4		12.0	17.1			12.5	10.2		10.3	
Level of Service	B	A		B	B			B	B		B	
Approach Delay (s)		9.6			17.0			11.8			10.3	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	268	0	0	580	52	280	625	38	0	0	0
Future Volume (vph)	73	268	0	0	580	52	280	625	38	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			0.99			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1504	3438			3137			2786				
Flt Permitted	0.29	1.00			1.00			0.99				
Satd. Flow (perm)	455	3438			3137			2786				
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	82	301	0	0	682	61	322	718	44	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	82	301	0	0	743	0	0	1084	0	0	0	0
Heavy Vehicles (%)	12%	12%	12%	11%	11%	11%	12%	12%	12%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	202	1528			1394			1238				
v/s Ratio Prot		0.09			c0.24							
v/s Ratio Perm	0.18							0.39				
v/c Ratio	0.41	0.20			0.53			0.88				
Uniform Delay, d1	16.9	15.2			18.2			22.7				
Progression Factor	2.21	2.26			1.00			1.00				
Incremental Delay, d2	5.6	0.3			1.5			8.8				
Delay (s)	43.1	34.7			19.7			31.6				
Level of Service	D	C			B			C				
Approach Delay (s)		36.5			19.7			31.6			0.0	
Approach LOS		D			B			C			A	

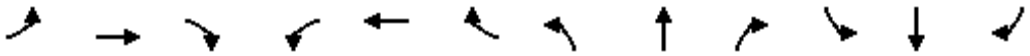
Intersection Summary			
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	240	32	20	318	24	111	112	43	0	31	4
Future Volume (vph)	8	240	32	20	318	24	111	112	43	0	31	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.98			0.99			0.98			0.98	
Flt Protected	0.95	1.00			1.00			0.98			1.00	
Satd. Flow (prot)	1374	1421			2945			1492			1388	
Flt Permitted	0.47	1.00			0.93			0.85			1.00	
Satd. Flow (perm)	683	1421			2736			1294			1388	
Peak-hour factor, PHF	0.88	0.88	0.88	0.83	0.83	0.83	0.82	0.82	0.82	0.81	0.81	0.81
Adj. Flow (vph)	9	273	36	24	383	29	135	137	52	0	38	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	9	309	0	0	436	0	0	324	0	0	43	0
Heavy Vehicles (%)	27%	27%	27%	17%	17%	17%	18%	18%	18%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)											3	3
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	311	647			1246			560			601	
v/s Ratio Prot		c0.22									0.03	
v/s Ratio Perm	0.01				0.16			c0.25				
v/c Ratio	0.03	0.48			0.35			0.58			0.07	
Uniform Delay, d1	13.5	17.0			15.9			19.3			14.9	
Progression Factor	1.00	1.00			2.26			1.00			1.00	
Incremental Delay, d2	0.2	2.5			0.7			4.3			0.2	
Delay (s)	13.7	19.6			36.7			23.6			15.1	
Level of Service	B	B			D			C			B	
Approach Delay (s)		19.4			36.7			23.6			15.1	
Approach LOS		B			D			C			B	

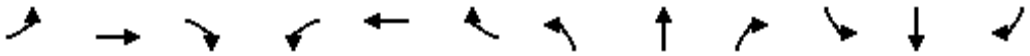
Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	113	0	0	96	13	239	451	59	9	0	57
Future Volume (vph)	68	113	0	0	96	13	239	451	59	9	0	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.98			0.88	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2364			3182		1439	3113			1588	
Flt Permitted		0.81			1.00		0.70	1.00			0.92	
Satd. Flow (perm)		1962			3182		1067	3113			1465	
Peak-hour factor, PHF	0.86	0.86	0.86	0.81	0.81	0.81	0.85	0.85	0.85	0.81	0.81	0.81
Adj. Flow (vph)	79	131	0	0	119	16	281	531	69	11	0	70
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	210	0	0	135	0	281	600	0	0	81	0
Heavy Vehicles (%)	31%	31%	31%	4%	4%	4%	11%	11%	11%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		850			1378		426	1245			586	
v/s Ratio Prot					0.04			0.19				
v/s Ratio Perm		c0.11					c0.26				0.06	
v/c Ratio		0.25			0.10		0.66	0.48			0.14	
Uniform Delay, d1		10.8			10.1		14.7	13.4			11.4	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.7			0.1		7.8	1.3			0.5	
Delay (s)		11.5			10.2		22.5	14.7			11.9	
Level of Service		B			B		C	B			B	
Approach Delay (s)		11.5			10.2			17.2			11.9	
Approach LOS		B			B			B			B	

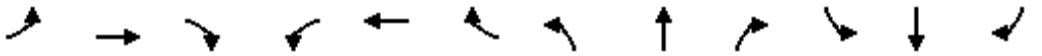
Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	162	124	56	336	0	0	0	0	20	144	27
Future Volume (vph)	0	162	124	56	336	0	0	0	0	20	144	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.94			1.00						0.98	
Flt Protected		1.00			0.99						0.99	
Satd. Flow (prot)		2520			2987						2442	
Flt Permitted		1.00			0.85						0.99	
Satd. Flow (perm)		2520			2546						2442	
Peak-hour factor, PHF	0.85	0.85	0.85	0.83	0.83	0.83	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	0	191	146	67	405	0	0	0	0	22	162	30
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	337	0	0	472	0	0	0	0	0	214	0
Heavy Vehicles (%)	25%	25%	25%	12%	12%	12%	2%	2%	2%	27%	27%	27%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1120			1131						1085	
v/s Ratio Prot		0.13										
v/s Ratio Perm					c0.19						0.09	
v/c Ratio		0.30			0.42						0.20	
Uniform Delay, d1		16.0			17.1						15.2	
Progression Factor		1.22			1.00						1.00	
Incremental Delay, d2		0.6			1.1						0.4	
Delay (s)		20.2			18.2						15.6	
Level of Service		C			B						B	
Approach Delay (s)		20.2			18.2			0.0			15.6	
Approach LOS		C			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	0	0	0	46	5	27	171	0	0	0	46
Future Volume (Veh/h)	113	0	0	0	46	5	27	171	0	0	0	46
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.82	0.82	0.82	0.81	0.81	0.81
Hourly flow rate (vph)	140	0	0	0	57	6	33	209	0	0	0	57
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	310	275	0	304	332	209	57			209		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	310	275	0	304	332	209	57			209		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.2			2.2		
p0 queue free %	75	100	100	100	90	99	98			100		
cM capacity (veh/h)	563	604	1059	617	558	804	1541			1374		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	140	38	25	242	57
Volume Left	140	0	0	33	0
Volume Right	0	0	6	0	57
cSH	563	558	602	1541	1700
Volume to Capacity	0.25	0.07	0.04	0.02	0.03
Queue Length 95th (ft)	24	5	3	2	0
Control Delay (s)	13.5	11.9	11.2	1.2	0.0
Lane LOS	B	B	B	A	
Approach Delay (s)	13.5	11.7		1.2	0.0
Approach LOS	B	B			

Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	30.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Synchro Analysis

PM No-Build 2022

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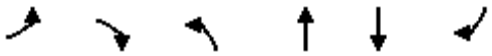
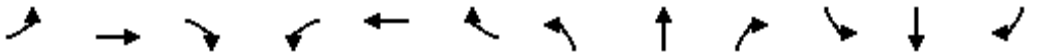


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	17	24	38	670	890	58
Future Volume (vph)	17	24	38	670	890	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.92		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1662		1268	2893	2809	
Flt Permitted	0.98		0.19	1.00	1.00	
Satd. Flow (perm)	1662		259	2893	2809	
Peak-hour factor, PHF	0.81	0.81	0.97	0.97	0.87	0.87
Adj. Flow (vph)	21	30	39	691	1023	67
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	51	0	39	691	1090	0
Heavy Vehicles (%)	10%	10%	14%	14%	12%	12%
Parking (#/hr)		3	2	2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	535		146	1639	1591	
v/s Ratio Prot	c0.03			0.24	c0.39	
v/s Ratio Perm			0.15			
v/c Ratio	0.10		0.27	0.42	0.69	
Uniform Delay, d1	21.3		10.0	11.1	13.8	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.4		4.4	0.8	2.4	
Delay (s)	21.7		14.4	11.9	16.2	
Level of Service	C		B	B	B	
Approach Delay (s)	21.7			12.0	16.2	
Approach LOS	C			B	B	

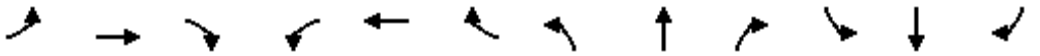
Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	730	258	148	754	0	0	0	0	54	728	99
Future Volume (vph)	0	730	258	148	754	0	0	0	0	54	728	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.98	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3202	1432	1641	3308						2913	
Flt Permitted		1.00	1.00	0.22	1.00						1.00	
Satd. Flow (perm)		3202	1432	380	3308						2913	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	0	793	280	164	838	0	0	0	0	59	800	109
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	793	280	164	838	0	0	0	0	0	968	0
Heavy Vehicles (%)	9%	9%	9%	10%	10%	10%	2%	2%	2%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2	2				3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1067	477	257	1506						1262	
v/s Ratio Prot		c0.25		0.04	c0.25							
v/s Ratio Perm			0.20	0.25							0.33	
v/c Ratio		0.74	0.59	0.64	0.56						0.77	
Uniform Delay, d1		26.6	24.9	29.1	17.9						21.6	
Progression Factor		1.00	1.00	0.53	0.43						1.00	
Incremental Delay, d2		4.7	5.2	9.8	1.2						4.5	
Delay (s)		31.3	30.1	25.2	8.9						26.1	
Level of Service		C	C	C	A						C	
Approach Delay (s)		31.0			11.6			0.0			26.1	
Approach LOS		C			B			A			C	

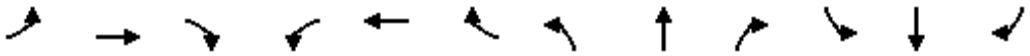
Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	750	6	68	709	75	32	120	162	82	81	48
Future Volume (vph)	43	750	6	68	709	75	32	120	162	82	81	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1601	3118		1532	4150			1782	1531		1913	
Flt Permitted	0.27	1.00		0.24	1.00			0.91	1.00		0.83	
Satd. Flow (perm)	460	3118		390	4150			1645	1531		1621	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.91	0.91	0.91	0.94	0.94	0.94
Adj. Flow (vph)	47	815	7	76	788	83	35	132	178	87	86	51
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	47	822	0	76	871	0	0	167	178	0	224	0
Heavy Vehicles (%)	9%	9%	9%	10%	10%	10%	2%	2%	2%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	176	1195		149	1590			740	688		729	
v/s Ratio Prot		c0.26			0.21							
v/s Ratio Perm	0.10			0.19				0.10	0.12		c0.14	
v/c Ratio	0.27	0.69		0.51	0.55			0.23	0.26		0.31	
Uniform Delay, d1	12.7	15.5		14.2	14.4			10.1	10.3		10.5	
Progression Factor	1.55	1.38		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	2.9	2.6		11.9	1.4			0.7	0.9		1.1	
Delay (s)	22.7	24.0		26.1	15.8			10.8	11.2		11.6	
Level of Service	C	C		C	B			B	B		B	
Approach Delay (s)		23.9			16.6			11.0			11.6	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

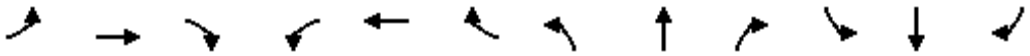
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	685	0	0	729	6	172	471	67	0	0	0
Future Volume (vph)	99	685	0	0	729	6	172	471	67	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			1.00			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1574	3599			3290			2747				
Flt Permitted	0.25	1.00			1.00			0.99				
Satd. Flow (perm)	417	3599			3290			2747				
Peak-hour factor, PHF	0.95	0.95	0.95	0.90	0.90	0.90	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	104	721	0	0	810	7	177	486	69	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	104	721	0	0	817	0	0	732	0	0	0	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	13%	13%	13%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	185	1599			1462			1220				
v/s Ratio Prot		0.20			0.25							
v/s Ratio Perm	c0.25							0.27				
v/c Ratio	0.56	0.45			0.56			0.60				
Uniform Delay, d1	18.5	17.4			18.5			18.9				
Progression Factor	0.18	0.10			1.00			1.00				
Incremental Delay, d2	7.8	0.6			1.5			2.2				
Delay (s)	11.2	2.3			20.0			21.1				
Level of Service	B	A			C			C				
Approach Delay (s)		3.4			20.0			21.1			0.0	
Approach LOS		A			C			C			A	

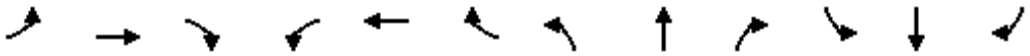
Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



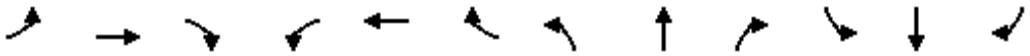
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	525	69	62	307	34	56	65	117	14	80	23
Future Volume (vph)	33	525	69	62	307	34	56	65	117	14	80	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.98			0.99			0.93			0.97	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1504	1556			2947			1555			1378	
Flt Permitted	0.47	1.00			0.65			0.90			0.96	
Satd. Flow (perm)	750	1556			1924			1421			1326	
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	37	583	77	67	330	37	62	71	129	15	87	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	37	660	0	0	434	0	0	262	0	0	127	0
Heavy Vehicles (%)	16%	16%	16%	16%	16%	16%	9%	9%	9%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)										3	3	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	341	708			876			615			574	
v/s Ratio Prot		c0.42										
v/s Ratio Perm	0.05				0.23			c0.18			0.10	
v/c Ratio	0.11	0.93			0.50			0.43			0.22	
Uniform Delay, d1	14.0	23.2			17.2			17.7			16.0	
Progression Factor	1.00	1.00			1.12			1.00			1.00	
Incremental Delay, d2	0.6	20.8			1.4			2.2			0.9	
Delay (s)	14.7	44.0			20.7			19.9			16.9	
Level of Service	B	D			C			B			B	
Approach Delay (s)		42.4			20.7			19.9			16.9	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	317	0	0	178	22	156	343	77	40	0	188
Future Volume (vph)	163	317	0	0	178	22	156	343	77	40	0	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.89	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2721			3282		1426	3052			1609	
Flt Permitted		0.76			1.00		0.59	1.00			0.87	
Satd. Flow (perm)		2111			3282		890	3052			1407	
Peak-hour factor, PHF	0.98	0.98	0.98	0.87	0.87	0.87	0.90	0.90	0.90	0.87	0.87	0.87
Adj. Flow (vph)	166	323	0	0	205	25	173	381	86	46	0	216
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	489	0	0	230	0	173	467	0	0	262	0
Heavy Vehicles (%)	14%	14%	14%	1%	1%	1%	12%	12%	12%	4%	4%	4%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		914			1422		356	1220			562	
v/s Ratio Prot					0.07			0.15				
v/s Ratio Perm		c0.23					c0.19				0.19	
v/c Ratio		0.54			0.16		0.49	0.38			0.47	
Uniform Delay, d1		12.5			10.4		13.4	12.8			13.3	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		2.2			0.2		4.7	0.9			2.8	
Delay (s)		14.8			10.6		18.1	13.7			16.0	
Level of Service		B			B		B	B			B	
Approach Delay (s)		14.8			10.6			14.9			16.0	
Approach LOS		B			B			B			B	

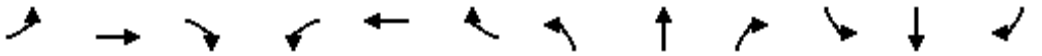
Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	441	214	170	351	0	0	0	0	29	497	55
Future Volume (vph)	0	441	214	170	351	0	0	0	0	29	497	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		2810			3014						2795	
Flt Permitted		1.00			0.58						1.00	
Satd. Flow (perm)		2810			1762						2795	
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	479	233	183	377	0	0	0	0	31	529	59
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	712	0	0	560	0	0	0	0	0	619	0
Heavy Vehicles (%)	14%	14%	14%	10%	10%	10%	2%	2%	2%	12%	12%	12%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1248			783						1242	
v/s Ratio Prot		0.25										
v/s Ratio Perm					c0.32						0.22	
v/c Ratio		0.57			0.72						0.50	
Uniform Delay, d1		18.6			20.4						17.8	
Progression Factor		1.66			1.00						1.00	
Incremental Delay, d2		1.0			5.5						1.4	
Delay (s)		31.9			25.9						19.3	
Level of Service		C			C						B	
Approach Delay (s)		31.9			25.9			0.0			19.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	235	0	0	0	117	11	18	67	0	0	0	154
Future Volume (Veh/h)	235	0	0	0	117	11	18	67	0	0	0	154
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.90	0.90	0.90	0.92	0.92	0.92	0.83	0.83	0.83
Hourly flow rate (vph)	273	0	0	0	130	12	20	73	0	0	0	186
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	190	113	0	206	299	73	186			73		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	190	113	0	206	299	73	186			73		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	56	100	100	100	78	99	99			100		
cM capacity (veh/h)	627	766	1085	737	599	981	1365			1502		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	273	87	55	93	186
Volume Left	273	0	0	20	0
Volume Right	0	0	12	0	186
cSH	627	599	654	1365	1700
Volume to Capacity	0.44	0.14	0.08	0.01	0.11
Queue Length 95th (ft)	55	13	7	1	0
Control Delay (s)	15.1	12.0	11.0	1.7	0.0
Lane LOS	C	B	B	A	
Approach Delay (s)	15.1	11.6		1.7	0.0
Approach LOS	C	B			

Intersection Summary				
Average Delay	8.6			
Intersection Capacity Utilization	31.1%	ICU Level of Service		A
Analysis Period (min)	15			

Synchro Analysis

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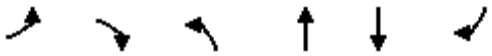
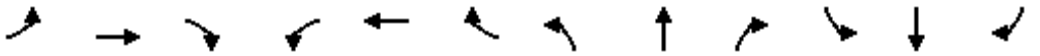


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	4	7	90	897	330	14
Future Volume (vph)	4	7	90	897	330	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.91		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	865		1490	3025	2652	
Flt Permitted	0.98		0.51	1.00	1.00	
Satd. Flow (perm)	865		792	3025	2652	
Peak-hour factor, PHF	0.81	0.81	0.86	0.86	0.83	0.83
Adj. Flow (vph)	5	9	105	1043	398	17
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	14	0	105	1043	415	0
Heavy Vehicles (%)	86%	86%	9%	9%	19%	19%
Parking (#/hr)	3	3		2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	278		448	1714	1502	
v/s Ratio Prot	c0.02			c0.34	0.16	
v/s Ratio Perm			0.13			
v/c Ratio	0.05		0.23	0.61	0.28	
Uniform Delay, d1	21.0		9.7	12.9	10.0	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		1.2	1.6	0.5	
Delay (s)	21.4		11.0	14.5	10.5	
Level of Service	C		B	B	B	
Approach Delay (s)	21.4			14.2	10.5	
Approach LOS	C			B	B	

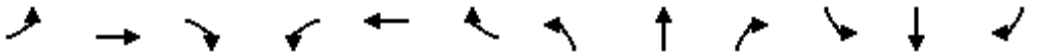
Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	107.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



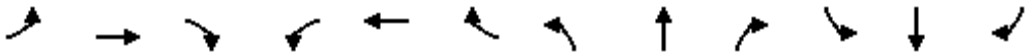
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	320	118	110	796	0	0	0	0	22	289	41
Future Volume (vph)	0	320	118	110	796	0	0	0	0	22	289	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.98	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		2983	1334	1583	3192						2759	
Flt Permitted		1.00	1.00	0.48	1.00						1.00	
Satd. Flow (perm)		2983	1334	807	3192						2759	
Peak-hour factor, PHF	0.83	0.83	0.83	0.86	0.86	0.86	0.92	0.92	0.92	0.82	0.82	0.82
Adj. Flow (vph)	0	386	142	128	926	0	0	0	0	27	352	50
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	386	142	128	926	0	0	0	0	0	429	0
Heavy Vehicles (%)	17%	17%	17%	14%	14%	14%	2%	2%	2%	15%	15%	15%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2					3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		994	444	419	1454						1195	
v/s Ratio Prot		0.13		0.02	c0.29							
v/s Ratio Perm			0.11	0.12							0.16	
v/c Ratio		0.39	0.32	0.31	0.64						0.36	
Uniform Delay, d1		23.0	22.4	17.4	18.8						17.1	
Progression Factor		1.00	1.00	1.36	1.34						1.00	
Incremental Delay, d2		1.1	1.9	1.4	1.6						0.8	
Delay (s)		24.1	24.3	24.9	26.9						18.0	
Level of Service		C	C	C	C						B	
Approach Delay (s)		24.2			26.6			0.0			18.0	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



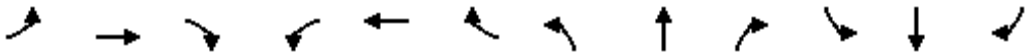
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	321	4	16	703	117	82	125	82	44	25	13
Future Volume (vph)	24	321	4	16	703	117	82	125	82	44	25	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.98			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.97	
Satd. Flow (prot)	1466	2854		1465	3941			1748	1516		1769	
Flt Permitted	0.24	1.00		0.52	1.00			0.85	1.00		0.78	
Satd. Flow (perm)	369	2854		802	3941			1510	1516		1418	
Peak-hour factor, PHF	0.83	0.83	0.83	0.86	0.86	0.86	0.82	0.82	0.82	0.81	0.81	0.81
Adj. Flow (vph)	29	387	5	19	817	136	100	152	100	54	31	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	29	392	0	19	953	0	0	252	100	0	101	0
Heavy Vehicles (%)	19%	19%	19%	15%	15%	15%	3%	3%	3%	16%	16%	16%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	141	1094		307	1510			679	682		638	
v/s Ratio Prot		0.14			c0.24							
v/s Ratio Perm	0.08			0.02				c0.17	0.07		0.07	
v/c Ratio	0.21	0.36		0.06	0.63			0.37	0.15		0.16	
Uniform Delay, d1	12.4	13.2		11.7	15.0			10.9	9.7		9.8	
Progression Factor	0.69	0.69		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	3.2	0.9		0.4	2.0			1.6	0.5		0.5	
Delay (s)	11.7	10.0		12.1	17.1			12.5	10.2		10.3	
Level of Service	B	A		B	B			B	B		B	
Approach Delay (s)		10.1			17.0			11.8			10.3	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



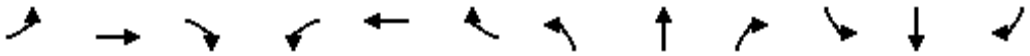
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	268	0	0	624	52	282	606	38	0	0	0
Future Volume (vph)	73	268	0	0	624	52	282	606	38	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			0.99			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1504	3438			3139			2785				
Flt Permitted	0.26	1.00			1.00			0.99				
Satd. Flow (perm)	415	3438			3139			2785				
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	82	301	0	0	734	61	324	697	44	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	82	301	0	0	795	0	0	1065	0	0	0	0
Heavy Vehicles (%)	12%	12%	12%	11%	11%	11%	12%	12%	12%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	184	1528			1395			1237				
v/s Ratio Prot		0.09			c0.25							
v/s Ratio Perm	0.20							0.38				
v/c Ratio	0.45	0.20			0.57			0.86				
Uniform Delay, d1	17.3	15.2			18.6			22.5				
Progression Factor	2.18	2.26			1.00			1.00				
Incremental Delay, d2	7.2	0.3			1.7			8.0				
Delay (s)	44.9	34.7			20.3			30.5				
Level of Service	D	C			C			C				
Approach Delay (s)		36.9			20.3			30.5			0.0	
Approach LOS		D			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



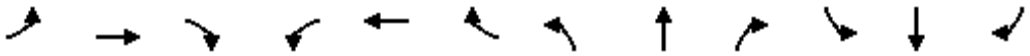
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	257	32	20	290	24	111	112	43	0	31	4
Future Volume (vph)	8	257	32	20	290	24	111	112	43	0	31	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.98			0.99			0.98			0.98	
Flt Protected	0.95	1.00			1.00			0.98			1.00	
Satd. Flow (prot)	1374	1422			2942			1492			1388	
Flt Permitted	0.50	1.00			0.92			0.85			1.00	
Satd. Flow (perm)	718	1422			2723			1294			1388	
Peak-hour factor, PHF	0.88	0.88	0.88	0.83	0.83	0.83	0.82	0.82	0.82	0.81	0.81	0.81
Adj. Flow (vph)	9	292	36	24	349	29	135	137	52	0	38	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	9	328	0	0	402	0	0	324	0	0	43	0
Heavy Vehicles (%)	27%	27%	27%	17%	17%	17%	18%	18%	18%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)											3	3
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	327	647			1240			560			601	
v/s Ratio Prot		c0.23									0.03	
v/s Ratio Perm	0.01				0.15			c0.25				
v/c Ratio	0.03	0.51			0.32			0.58			0.07	
Uniform Delay, d1	13.5	17.3			15.7			19.3			14.9	
Progression Factor	1.00	1.00			2.27			1.00			1.00	
Incremental Delay, d2	0.2	2.8			0.7			4.3			0.2	
Delay (s)	13.7	20.2			36.1			23.6			15.1	
Level of Service	B	C			D			C			B	
Approach Delay (s)		20.0			36.1			23.6			15.1	
Approach LOS		B			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	113	0	0	96	13	212	460	59	9	0	57
Future Volume (vph)	68	113	0	0	96	13	212	460	59	9	0	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.98			0.88	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2364			3182		1439	3114			1588	
Flt Permitted		0.81			1.00		0.70	1.00			0.92	
Satd. Flow (perm)		1962			3182		1067	3114			1463	
Peak-hour factor, PHF	0.86	0.86	0.86	0.81	0.81	0.81	0.85	0.85	0.85	0.81	0.81	0.81
Adj. Flow (vph)	79	131	0	0	119	16	249	541	69	11	0	70
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	210	0	0	135	0	249	610	0	0	81	0
Heavy Vehicles (%)	31%	31%	31%	4%	4%	4%	11%	11%	11%	5%	5%	5%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		850			1378		426	1245			585	
v/s Ratio Prot					0.04			0.20				
v/s Ratio Perm		c0.11					c0.23				0.06	
v/c Ratio		0.25			0.10		0.58	0.49			0.14	
Uniform Delay, d1		10.8			10.1		14.1	13.4			11.4	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.7			0.1		5.8	1.4			0.5	
Delay (s)		11.5			10.2		19.9	14.8			11.9	
Level of Service		B			B		B	B			B	
Approach Delay (s)		11.5			10.2			16.3			11.9	
Approach LOS		B			B			B			B	

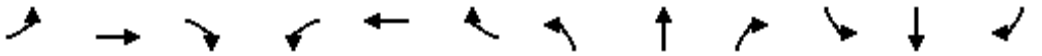
Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	162	141	56	308	0	0	0	0	20	154	27
Future Volume (vph)	0	162	141	56	308	0	0	0	0	20	154	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.93			1.00						0.98	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		2507			2985						2445	
Flt Permitted		1.00			0.84						1.00	
Satd. Flow (perm)		2507			2515						2445	
Peak-hour factor, PHF	0.85	0.85	0.85	0.83	0.83	0.83	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	0	191	166	67	371	0	0	0	0	22	173	30
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	357	0	0	438	0	0	0	0	0	225	0
Heavy Vehicles (%)	25%	25%	25%	12%	12%	12%	2%	2%	2%	27%	27%	27%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1114			1117						1086	
v/s Ratio Prot		0.14										
v/s Ratio Perm					c0.17						0.09	
v/c Ratio		0.32			0.39						0.21	
Uniform Delay, d1		16.2			16.8						15.3	
Progression Factor		1.22			1.00						1.00	
Incremental Delay, d2		0.7			1.0						0.4	
Delay (s)		20.5			17.9						15.7	
Level of Service		C			B						B	
Approach Delay (s)		20.5			17.9			0.0			15.7	
Approach LOS		C			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	0	0	0	46	5	27	171	0	0	0	46
Future Volume (Veh/h)	113	0	0	0	46	5	27	171	0	0	0	46
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.82	0.82	0.82	0.81	0.81	0.81
Hourly flow rate (vph)	140	0	0	0	57	6	33	209	0	0	0	57
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	310	275	0	304	332	209	57			209		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	310	275	0	304	332	209	57			209		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.2			2.2		
p0 queue free %	75	100	100	100	90	99	98			100		
cM capacity (veh/h)	563	604	1059	617	558	804	1541			1374		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	140	38	25	242	57
Volume Left	140	0	0	33	0
Volume Right	0	0	6	0	57
cSH	563	558	602	1541	1700
Volume to Capacity	0.25	0.07	0.04	0.02	0.03
Queue Length 95th (ft)	24	5	3	2	0
Control Delay (s)	13.5	11.9	11.2	1.2	0.0
Lane LOS	B	B	B	A	
Approach Delay (s)	13.5	11.7		1.2	0.0
Approach LOS	B	B			

Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	30.1%	ICU Level of Service		A
Analysis Period (min)	15			

Synchro Analysis

PM Construction 2022

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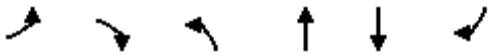
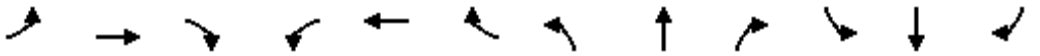


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	15	21	23	672	963	35
Future Volume (vph)	15	21	23	672	963	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	12	9	11	10	12
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.92		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1664		1268	2893	2821	
Flt Permitted	0.98		0.18	1.00	1.00	
Satd. Flow (perm)	1664		235	2893	2821	
Peak-hour factor, PHF	0.81	0.81	0.97	0.97	0.87	0.87
Adj. Flow (vph)	19	26	24	693	1107	40
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	45	0	24	693	1147	0
Heavy Vehicles (%)	10%	10%	14%	14%	12%	12%
Parking (#/hr)		3	2	2	3	3
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0		51.0	51.0	51.0	
Effective Green, g (s)	29.0		51.0	51.0	51.0	
Actuated g/C Ratio	0.32		0.57	0.57	0.57	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)	536		133	1639	1598	
v/s Ratio Prot	c0.03			0.24	c0.41	
v/s Ratio Perm			0.10			
v/c Ratio	0.08		0.18	0.42	0.72	
Uniform Delay, d1	21.2		9.4	11.1	14.2	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		3.0	0.8	2.8	
Delay (s)	21.6		12.4	11.9	17.0	
Level of Service	C		B	B	B	
Approach Delay (s)	21.6			11.9	17.0	
Approach LOS	C			B	B	

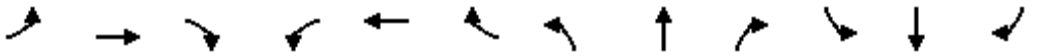
Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



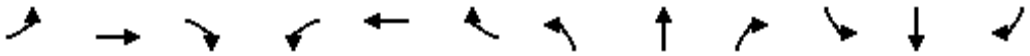
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	733	263	153	770	0	0	0	0	54	731	99
Future Volume (vph)	0	733	263	153	770	0	0	0	0	54	731	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	14	12	12	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95						0.95	
Frt		1.00	0.85	1.00	1.00						0.98	
Flt Protected		1.00	1.00	0.95	1.00						1.00	
Satd. Flow (prot)		3202	1432	1641	3308						2913	
Flt Permitted		1.00	1.00	0.22	1.00						1.00	
Satd. Flow (perm)		3202	1432	376	3308						2913	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	0	797	286	170	856	0	0	0	0	59	803	109
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	797	286	170	856	0	0	0	0	0	971	0
Heavy Vehicles (%)	9%	9%	9%	10%	10%	10%	2%	2%	2%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	24	0
Parking (#/hr)					2	2				3	3	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Actuated Green, G (s)		30.0	30.0	41.0	41.0						39.0	
Effective Green, g (s)		30.0	30.0	41.0	41.0						39.0	
Actuated g/C Ratio		0.33	0.33	0.46	0.46						0.43	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Grp Cap (vph)		1067	477	255	1506						1262	
v/s Ratio Prot		c0.25		0.04	c0.26							
v/s Ratio Perm			0.20	0.26							0.33	
v/c Ratio		0.75	0.60	0.67	0.57						0.77	
Uniform Delay, d1		26.6	25.0	29.2	18.0						21.7	
Progression Factor		1.00	1.00	0.55	0.44						1.00	
Incremental Delay, d2		4.8	5.5	10.9	1.3						4.6	
Delay (s)		31.4	30.5	27.1	9.2						26.2	
Level of Service		C	C	C	A						C	
Approach Delay (s)		31.2			12.2			0.0			26.2	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



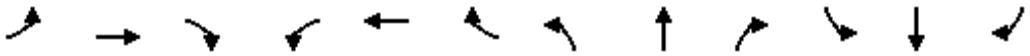
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	753	6	68	726	75	34	121	171	82	81	48
Future Volume (vph)	43	753	6	68	726	75	34	121	171	82	81	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	12	14	12	11	11	12	16	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	
Satd. Flow (prot)	1601	3118		1532	4152			1781	1531		1913	
Flt Permitted	0.26	1.00		0.24	1.00			0.91	1.00		0.83	
Satd. Flow (perm)	446	3118		388	4152			1637	1531		1619	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.91	0.91	0.91	0.94	0.94	0.94
Adj. Flow (vph)	47	818	7	76	807	83	37	133	188	87	86	51
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	47	825	0	76	890	0	0	170	188	0	224	0
Heavy Vehicles (%)	9%	9%	9%	10%	10%	10%	2%	2%	2%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	56	0	0	0	0	0	0	0
Parking (#/hr)		3	3		1	1						
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			27.0	27.0		27.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.45	0.45		0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Grp Cap (vph)	170	1195		148	1591			736	688		728	
v/s Ratio Prot		c0.26			0.21							
v/s Ratio Perm	0.11			0.20				0.10	0.12		c0.14	
v/c Ratio	0.28	0.69		0.51	0.56			0.23	0.27		0.31	
Uniform Delay, d1	12.8	15.5		14.2	14.5			10.1	10.3		10.5	
Progression Factor	1.55	1.38		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	3.2	2.6		12.2	1.4			0.7	1.0		1.1	
Delay (s)	22.9	24.0		26.4	15.9			10.9	11.3		11.6	
Level of Service	C	C		C	B			B	B		B	
Approach Delay (s)		23.9			16.8			11.1			11.6	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



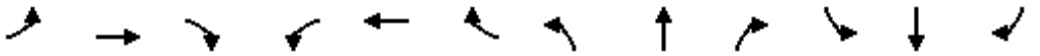
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	688	0	0	732	6	191	464	99	0	0	0
Future Volume (vph)	99	688	0	0	732	6	191	464	99	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	14	12	12	13	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frt	1.00	1.00			1.00			0.98				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1574	3599			3290			2730				
Flt Permitted	0.25	1.00			1.00			0.99				
Satd. Flow (perm)	415	3599			3290			2730				
Peak-hour factor, PHF	0.95	0.95	0.95	0.90	0.90	0.90	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	104	724	0	0	813	7	197	478	102	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	104	724	0	0	820	0	0	777	0	0	0	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	13%	13%	13%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	33	0	0	0	0
Parking (#/hr)					2	2		2	2			
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	40.0	40.0			40.0			40.0				
Effective Green, g (s)	40.0	40.0			40.0			40.0				
Actuated g/C Ratio	0.44	0.44			0.44			0.44				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Lane Grp Cap (vph)	184	1599			1462			1213				
v/s Ratio Prot		0.20			0.25							
v/s Ratio Perm	c0.25							0.28				
v/c Ratio	0.57	0.45			0.56			0.64				
Uniform Delay, d1	18.5	17.4			18.5			19.4				
Progression Factor	0.19	0.10			1.00			1.00				
Incremental Delay, d2	7.9	0.6			1.6			2.6				
Delay (s)	11.3	2.3			20.1			22.0				
Level of Service	B	A			C			C				
Approach Delay (s)		3.4			20.1			22.0			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



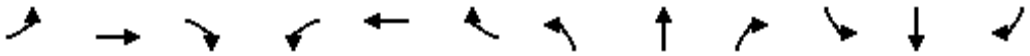
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	526	69	62	291	34	56	66	117	14	80	23
Future Volume (vph)	33	526	69	62	291	34	56	66	117	14	80	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	12	12	11	12	12	9	12
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00			0.95			1.00			1.00	
Frt	1.00	0.98			0.99			0.93			0.97	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1504	1556			2945			1556			1378	
Flt Permitted	0.49	1.00			0.65			0.90			0.96	
Satd. Flow (perm)	769	1556			1915			1423			1326	
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	37	584	77	67	313	37	62	73	129	15	87	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	37	661	0	0	417	0	0	264	0	0	127	0
Heavy Vehicles (%)	16%	16%	16%	16%	16%	16%	9%	9%	9%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	10	0
Parking (#/hr)										3	3	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0			41.0			39.0			39.0	
Effective Green, g (s)	41.0	41.0			41.0			39.0			39.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.43			0.43	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	350	708			872			616			574	
v/s Ratio Prot		c0.42										
v/s Ratio Perm	0.05				0.22			c0.19			0.10	
v/c Ratio	0.11	0.93			0.48			0.43			0.22	
Uniform Delay, d1	14.0	23.2			17.1			17.7			16.0	
Progression Factor	1.00	1.00			1.12			1.00			1.00	
Incremental Delay, d2	0.6	21.0			1.4			2.2			0.9	
Delay (s)	14.6	44.2			20.5			19.9			16.9	
Level of Service	B	D			C			B			B	
Approach Delay (s)		42.6			20.5			19.9			16.9	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	317	0	0	178	22	141	350	77	40	0	188
Future Volume (vph)	163	317	0	0	178	22	141	350	77	40	0	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	10	12	12	13	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95			1.00	
Frt		1.00			0.98		1.00	0.97			0.89	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2721			3282		1426	3054			1609	
Flt Permitted		0.76			1.00		0.59	1.00			0.87	
Satd. Flow (perm)		2111			3282		890	3054			1405	
Peak-hour factor, PHF	0.98	0.98	0.98	0.87	0.87	0.87	0.90	0.90	0.90	0.87	0.87	0.87
Adj. Flow (vph)	166	323	0	0	205	25	157	389	86	46	0	216
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	489	0	0	230	0	157	475	0	0	262	0
Heavy Vehicles (%)	14%	14%	14%	1%	1%	1%	12%	12%	12%	4%	4%	4%
Bus Blockages (#/hr)	0	48	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)							3	3				
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0			26.0		24.0	24.0			24.0	
Effective Green, g (s)		26.0			26.0		24.0	24.0			24.0	
Actuated g/C Ratio		0.43			0.43		0.40	0.40			0.40	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)		914			1422		356	1221			562	
v/s Ratio Prot					0.07			0.16				
v/s Ratio Perm		c0.23					0.18				c0.19	
v/c Ratio		0.54			0.16		0.44	0.39			0.47	
Uniform Delay, d1		12.5			10.4		13.1	12.8			13.3	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		2.2			0.2		3.9	0.9			2.8	
Delay (s)		14.8			10.6		17.0	13.7			16.0	
Level of Service		B			B		B	B			B	
Approach Delay (s)		14.8			10.6			14.5			16.0	
Approach LOS		B			B			B			B	

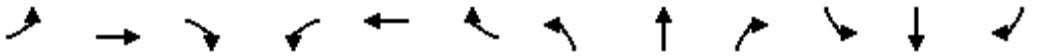
Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	441	215	170	335	0	0	0	0	29	499	55
Future Volume (vph)	0	441	215	170	335	0	0	0	0	29	499	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	10	12
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		2810			3012						2795	
Flt Permitted		1.00			0.57						1.00	
Satd. Flow (perm)		2810			1754						2795	
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	479	234	183	360	0	0	0	0	31	531	59
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	713	0	0	543	0	0	0	0	0	621	0
Heavy Vehicles (%)	14%	14%	14%	10%	10%	10%	2%	2%	2%	12%	12%	12%
Parking (#/hr)										2	2	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0			40.0						40.0	
Effective Green, g (s)		40.0			40.0						40.0	
Actuated g/C Ratio		0.44			0.44						0.44	
Clearance Time (s)		5.0			5.0						5.0	
Lane Grp Cap (vph)		1248			779						1242	
v/s Ratio Prot		0.25										
v/s Ratio Perm					c0.31						0.22	
v/c Ratio		0.57			0.70						0.50	
Uniform Delay, d1		18.6			20.1						17.9	
Progression Factor		1.66			1.00						1.00	
Incremental Delay, d2		1.0			5.1						1.4	
Delay (s)		32.0			25.2						19.3	
Level of Service		C			C						B	
Approach Delay (s)		32.0			25.2			0.0			19.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	235	0	0	0	117	23	18	67	0	0	0	154
Future Volume (Veh/h)	235	0	0	0	117	23	18	67	0	0	0	154
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.90	0.90	0.90	0.92	0.92	0.92	0.83	0.83	0.83
Hourly flow rate (vph)	273	0	0	0	130	26	20	73	0	0	0	186
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											331	
pX, platoon unblocked												
vC, conflicting volume	204	113	0	206	299	73	186			73		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	204	113	0	206	299	73	186			73		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	55	100	100	100	78	97	99			100		
cM capacity (veh/h)	605	766	1085	737	599	981	1365			1502		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	273	87	69	93	186
Volume Left	273	0	0	20	0
Volume Right	0	0	26	0	186
cSH	605	599	702	1365	1700
Volume to Capacity	0.45	0.14	0.10	0.01	0.11
Queue Length 95th (ft)	58	13	8	1	0
Control Delay (s)	15.8	12.0	10.7	1.7	0.0
Lane LOS	C	B	B	A	
Approach Delay (s)	15.8	11.4		1.7	0.0
Approach LOS	C	B			

Intersection Summary				
Average Delay	8.8			
Intersection Capacity Utilization	31.5%	ICU Level of Service		A
Analysis Period (min)	15			

Construction Noise Alternative D Calculations

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Construction Noise Alt D Calculations

		UTILIZED MAX DURATION			Stages (# pieces)																											
					2021						2022							2023					2024									
Equipment (> 50 hp)	**#Hrs/ day**	**Duration 1**	**Duration 2**	**Duration 3**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**l Noise (Lmax)**	**hour Acoustical Usag**
Back Hoe	7	75%	25%			6	6				2	2	2	2							4	4	4		2	2					80	40%
Dump Truck	7	75%	75%	75%		6	10														8	8	8								84	40%
Excavator	7	75%	75%	75%		6	10		1	1	1										8	8	8								85	40%
Compressor	7	75%	75%	75%		4	4														4	4	4								80	40%
Concrete Pump Truck	7	50%	50%	50%			1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1			82	20%
Concreter Truck	7	50%	25%				20	20	20		3	3	3	3	3	3						1	20	20	20	3	3	3			85	40%
Crane	7	50%	75%	25%						1	1	1	1	1								1	1		1	1	1	1			85	16%
Compactor	7	25%	25%	25%							3	3	3	3											3	3					80	20%
Scissor / Man Lift	7	20%	20%	20%									14	14	10	20	10	14	4								12	16	8	4	63	20%
Jack Hammer	7	75%	75%	75%		4	4														4	4	4								73	20%
Fork Lift	7	25%	25%	25%						1			8	8	4	8	4	6	2						1		12	16	8	4	64	40%
Duration (Days)						40	20	60	20	40	40	20	60	20	20	20	20	120	40	20	60	20	20	60	20	40	20	40	20	20		

107th Avenue

	INITIAL LEQ PREDICTION																											
	2021						2022							2023					2024									
Equipment (> 50 hp)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
Back Hoe	18.8	44.6	44.6	18.8	18.8	18.8	44.6	44.6	44.6	44.6	18.8	18.8	18.8	18.8	18.8	18.8	44.7	44.7	44.7	18.8	44.7	44.7	18.8	18.8	18.8	18.8
Dump Truck	22.8	48.6	48.6	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	48.7	48.7	48.7	22.8	22.8	22.8	22.8	22.8	22.8	22.8
Excavator	23.8	49.6	49.6	23.8	49.6	49.6	49.6	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	49.7	49.7	49.7	23.8	23.8	23.8	23.8	23.8	23.8	23.8
Compressor	18.8	18.8	44.6	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	44.7	44.7	44.7	18.8	18.8	18.8	18.8	18.8	18.8	18.8
Concrete Pump Truck	16.0	16.0	41.8	41.8	41.8	41.8	41.8	41.8	41.8	41.8	41.8	41.8	16.0	16.0	16.0	16.0	16.0	16.0	41.9	41.9	41.9	41.9	41.9	41.9	16.0	16.0
Concreter Truck	22.0	22.0	47.9	47.9	47.9	22.0	47.9	47.9	47.9	47.9	47.9	47.9	22.0	22.0	22.0	22.0	22.0	47.9	47.9	47.9	47.9	47.9	47.9	47.9	22.0	22.0
Crane	19.8	19.8	19.8	19.8	19.8	45.6	45.6	45.6	45.6	45.6	19.8	19.8	19.8	19.8	19.8	19.8	19.8	45.7	45.7	19.8	45.7	45.7	45.7	45.7	19.8	19.8
Compactor	11.0	11.0	11.0	11.0	11.0	11.0	36.8	36.8	36.8	36.8	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	36.9	36.9	11.0	11.0	11.0	11.0
Scissor / Man Lift	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	18.9	18.9	18.9	18.9	18.9	18.9	18.9	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	19.0	19.0	19.0	19.0
Jack Hammer	8.7	34.6	34.6	34.6	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	34.7	34.7	34.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
Fork Lift	-2.0	-2.0	-2.0	-2.0	-2.0	23.8	-2.0	-2.0	23.8	23.8	23.8	23.8	23.8	23.8	23.8	-2.0	-2.0	-2.0	-2.0	-2.0	23.9	-2.0	23.9	23.9	23.9	23.9
8HR LEQ	**#####**	**61**	**65**	**61**	**61**	**52**	**56**	**55**	**55**	**55**	**53**	**53**	**32**	**34**	**29**	**#####**	**62**	**62**	**65**	**61**	**61**	**55**	**54**	**54**	**34**	**31**

** All Phase I noise levels are conservative since the existing Depot structure would serve as a barrier for most residents along 165th Street*

Phase	Leq (dBA)
Phase I Max	65
Phase II Max	65

156th Street

	INITIAL LEQ PREDICTION																									
	2021						2022							2023					2024							
Equipment (> 50 hp)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
Back Hoe	18.8	50.3	50.3	18.8	18.8	18.8	50.3	50.3	50.3	50.3	18.8	18.8	18.8	18.8	18.8	18.8	58.5	58.5	58.5	18.8	58.5	58.5	18.8	18.8	18.8	18.8
Dump Truck	22.8	54.3	54.3	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	62.5	62.5	62.5	22.8	22.8	22.8	22.8	22.8	22.8	22.8
Excavator	23.8	55.3	55.3	23.8	55.3	55.3	55.3	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	63.5	63.5	63.5	23.8	23.8	23.8	23.8	23.8	23.8	23.8
Compressor	18.8	18.8	50.3	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	58.5	58.5	58.5	18.8	18.8	18.8	18.8	18.8	18.8	18.8
Concrete Pump Truck	16.0	16.0	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	16.0	16.0	16.0	16.0	16.0	16.0	55.7	55.7	55.7	55.7	55.7	55.7	16.0	16.0
Concreter Truck	22.0	22.0	53.5	53.5	53.5	22.0	53.5	53.5	53.5	53.5	53.5	53.5	22.0	22.0	22.0	22.0	22.0	61.7	61.7	61.7	61.7	61.7	61.7	61.7	22.0	22.0
Crane	19.8	19.8	19.8	19.8	19.8	51.3	51.3	51.3	51.3	51.3	19.8	19.8	19.8	19.8	19.8	19.8	19.8	59.5	59.5	19.8	59.5	59.5	59.5	59.5	19.8	19.8
Compactor	11.0	11.0	11.0	11.0	11.0	11.0	42.5	42.5	42.5	42.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	50.7	50.7	11.0	11.0	11.0	11.0
Scissor / Man Lift	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	24.5	24.5	24.5	24.5	24.5	24.5	24.5	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	32.7	32.7	32.7	32.7
Jack Hammer	8.7	40.3	40.3	40.3	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	48.5	48.5	48.5	8.7	8.7	8.7	8.7	8.7	8.7	8.7
Fork Lift	-2.0	-2.0	-2.0	-2.0	-2.0	29.5	-2.0	-2.0	29.5	29.5	29.5	29.5	29.5	29.5	29.5	-2.0	-2.0	-2.0	-2.0	-2.0	37.7	-2.0	37.7	37.7	37.7	37.7
	#####	**66**	**71**	**67**	**67**	**57**	**62**	**61**	**61**	**61**	**59**	**59**	**38**	**40**	**35**	**#####**	**76**	**76**	**78**	**75**	**75**	**69**	**68**	**68**	**48**	**45**

** All Phase I noise levels are conservative since the existing Depot structure would serve as a barrier for most residents along 165th Street*

Phase	Leq (dBA)
Phase I Max	71
Phase II Max	78

Merrick Boulevard

	INITIAL LEQ PREDICTION																									
	2021						2022							2023					2024							
Equipment (> 50 hp)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
Back Hoe	18.8	47.1	47.1	18.8	18.8	18.8	47.1	47.1	47.1	47.1	18.8	18.8	18.8	18.8	18.8	18.8	44.9	44.9	44.9	18.8	44.9	44.9	18.8	18.8	18.8	18.8
Dump Truck	22.8	51.1	51.1	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	48.9	48.9	48.9	22.8	22.8	22.8	22.8	22.8	22.8	22.8
Excavator	23.8	52.1	52.1	23.8	52.1	52.1	52.1	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	49.9	49.9	49.9	23.8	23.8	23.8	23.8	23.8	23.8	23.8
Compressor	18.8	18.8	47.1	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	44.9	44.9	44.9	18.8	18.8	18.8	18.8	18.8	18.8	18.8
Concrete Pump Truck	16.0	16.0	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	16.0	16.0	16.0	16.0	16.0	16.0	42.1	42.1	42.1	42.1	42.1	42.1	16.0	16.0
Concreter Truck	22.0	22.0	50.3	50.3	50.3	22.0	50.3	50.3	50.3	50.3	50.3	50.3	22.0	22.0	22.0	22.0	22.0	48.1	48.1	48.1	48.1	48.1	48.1	48.1	22.0	22.0
Crane	19.8	19.8	19.8	19.8	19.8	48.1	48.1	48.1	48.1	48.1	19.8	19.8	19.8	19.8	19.8	19.8	19.8	45.9	45.9	19.8	45.9	45.9	45.9	45.9	19.8	19.8
Compactor	11.0	11.0	11.0	11.0	11.0	11.0	39.3	39.3	39.3	39.3	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	37.1	37.1	11.0	11.0	11.0	11.0
Scissor / Man Lift	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	21.3	21.3	21.3	21.3	21.3	21.3	21.3	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	19.1	19.1	19.1	19.1
Jack Hammer	8.7	37.1	37.1	37.1	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	34.9	34.9	34.9	8.7	8.7	8.7	8.7	8.7	8.7	8.7
Fork Lift	-2.0	-2.0	-2.0	-2.0	-2.0	26.3	-2.0	-2.0	26.3	26.3	26.3	26.3	26.3	26.3	26.3	-2.0	-2.0	-2.0	-2.0	-2.0	24.1	-2.0	24.1	24.1	24.1	24.1
	#####	**63**	**67**	**63**	**64**	**54**	**58**	**57**	**57**	**57**	**55**	**55**	**35**	**36**	**31**	**#####**	**62**	**62**	**65**	**61**	**62**	**55**	**54**	**54**	**34**	**31**

** All Phase I noise levels are conservative since the existing Depot structure would serve as a barrier for most residents along 165th Street*

Phase	Leq (dBA)
Phase I Max	67
Phase II Max	65

Air Emission Burden Calculation Sheets

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CO Emission Burden Calculations

Equipment (> 50 hp)	#Hrs/day	Duration 1	Duration 2	Duration 3	Year: 2021 Stage 1	2	3	4	5	6	2022 Stage 7	8	9	10	11	12	13	2023 Stage 14	15	16	17	18	2024 Stage 19	20	21	22	23	24	25	26	HP	Emission Controls	2021 CO g/hp-hr	2022 CO g/hp-hr	2023 CO g/hp-hr	2024 CO g/hp-hr	2021 1	2	3	4	5	6
Backhoe	7	75%	25%			6	6				2	2	2	2							4	4	4		2	2					100	0.35	2.73134	2.54206	2.349988	2.16104	0.00000	0.13277	0.06639	0.00000	0.00000	0.00000
Dump Truck	7	75%	75%	75%		6	10														8	8	8								*300*	0.35	4.10713	3.773639	3.470259	3.20372	0.00000	0.59896	0.49913	0.00000	0.00000	0.00000
Excavator	7	75%	75%	75%		6	10		1	1	1										8	8	8								160	0.35	0.20964	0.17235	0.13121	0.10336	0.00000	0.01631	0.01359	0.00000	0.00136	0.00272
Concrete Pump Truck	7	50%	50%	50%			1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1			300	0.35	0.94864	0.857923	0.77398	0.698962	0.00000	0.00000	0.00769	0.02306	0.00769	0.01537
Concreter Truck	7	50%	25%				20	20	20		3	3	3	3	3	3						1	20	20	20	3	3	3			300	0.35	0.20545	0.17088	0.13452	0.10454	0.00000	0.00000	0.03329	0.09987	0.03329	0.00000
Crane	7	50%	75%	25%						1	1	1	1	1								1	1		1	1	1	1			240	0.35	0.35735	0.29967	0.24320	0.19334	0.00000	0.00000	0.00000	0.00000	0.00000	0.00695
Compactor	7	25%	25%	25%							3	3	3	3											3	3					50	0.35	2.32246	2.277043	2.244704	2.221296	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pile Driver	7	25%	25%	25%																											50	0.35	1.08735	0.978196	0.874919	0.790507	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Duration (Days)					40	20	60	20	40	40	20	60	20	20	20	20	120	40	20	60	20	20	60	20	40	20	40	20	20		260		**Stage Emissions Total (tons)**				0.00000	0.74804	0.62009	0.12293	0.04234	0.02504

Yearly Emissions Total (tons) **1.55843**

2022 7	8	9	10	11	12	13	2023 14	15	16	17	18	2024 19	20	21	22	23	24	25	26	*Worst Case Year (tons)*	*Daily Basis (g/s)*	*Yearly Basis (g/s)*	*Areawide Monthly Basis (g/s/m2)*	*Areawide Yearly Basis (g/s/m2)*
0.04119	0.02060	0.06179	0.02060	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.11424	0.03808	0.03502	0.00000	0.01751	0.03502	0.00000	0.00000	0.00000	0.00000					
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	1.01217	0.33739	0.31147	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000					
0.00223	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.02041	0.00680	0.00536	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000					
0.01390	0.00695	0.02085	0.00695	0.00695	0.00695	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00566	0.01699	0.00566	0.01133	0.00566	0.01133	0.00000	0.00000					
0.00831	0.00415	0.01246	0.00415	0.00415	0.00415	0.00000	0.00000	0.00000	0.00000	0.00000	0.00109	0.01694	0.05082	0.01694	0.00508	0.00254	0.00508	0.00000	0.00000					
0.00583	0.00291	0.00874	0.00291	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00236	0.00188	0.00000	0.00188	0.00376	0.00188	0.00376	0.00000	0.00000					
0.00922	0.00461	0.01384	0.00461	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00450	0.00900	0.00000	0.00000	0.00000	0.00000					
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000					
0.08068	0.03923	0.11768	0.03923	0.01110	0.01110	0.00000	0.00000	0.00000	0.00000	1.14681	0.38573	0.37633	0.06781	0.04649	0.06418	0.01008	0.02017	0.00000	0.00000	**1.558**	**0.6882**	**0.2160**	6.22E-05	1.52E-05
0.29902							**1.53254**					**0.58506**												

NOx Emission Burden Calculations

					Year																													
					2021						2022							2023						2024											
					Stage																														
Equipment (> 50 hp)	#Hrs/day	Duration 1	Duration 2	Duration 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	HP	Emission Controls	2021 NOx g/hp-hr	2022 NOx g/hp-hr	2023 NOx g/hp-hr	2024 NOx g/hp-hr
Backhoe	7	75%	25%			6	6				2	2	2	2							4	4	4		2	2					100	0.25	3.09678	2.917475	2.737857	2.563247
Dump Truck	7	75%	75%	75%		6	10														8	8	8								*300*	0.25	4.39358	4.156534	3.933639	3.734156
Excavator	7	75%	75%	75%		6	10		1	1	1										8	8	8								160	0.25	0.65385	0.56307	0.48456	0.42832
Concrete Pump Truck	7	50%	50%	50%			1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1			300	0.25	1.92191	1.751947	1.593989	1.44907
Concreter Truck	7	50%	25%				20	20	20		3	3	3	3	3	3						1	20	20	20	3	3	3			300	0.25	1.59678	1.54209	1.48765	1.44485
Crane	7	50%	75%	25%						1	1	1	1	1								1	1		1	1	1	1			240	0.25	1.24386	1.03006	0.85084	0.70094
Compactor	7	25%	25%	25%							3	3	3	3											3	3					50	0.25	4.14449	4.112352	4.091574	4.079072
Pile Driver	7	25%	25%	25%																											50	0.25	3.27316	2.964133	2.669085	2.44141
Duration (Days)						40	20	60	20	40	40	20	60	20	20	20	20	120	40	20	60	20	20	60	20	40	20	40	20	20	260					
						360												260																	

2021						
1	2	3	4	5	6	
0.00000	0.10753	0.05376	0.00000	0.00000	0.00000	
0.00000	0.45767	0.38139	0.00000	0.00000	0.00000	
0.00000	0.03632	0.03027	0.00000	0.00303	0.00605	
0.00000	0.00000	0.01112	0.03337	0.01112	0.02224	
0.00000	0.00000	0.18481	0.55444	0.18481	0.00000	
0.00000	0.00000	0.00000	0.00000	0.00000	0.01728	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
Stage Emissions Total (tons)	0.00000	0.60152	0.66136	0.58781	0.19896	0.04557
Yearly Emissions Total (tons)	**2.09523**					

2022							2023					2024											
7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	*Worst Case Year (tons)*	*Daily Basis (g/s)*	*Yearly Basis (g/s)*	*Areawide Monthly Basis (g/s/m2)*	*Areawide Yearly Basis (g/s/m2)*
0.03377	0.01688	0.05065	0.01688	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.09507	0.03169	0.02967	0.00000	0.01483	0.02967	0.00000	0.00000	0.00000	0.00000					
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.81951	0.27317	0.25932	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000					
0.00521	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.05384	0.01795	0.01586	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000					
0.02028	0.01014	0.03042	0.01014	0.01014	0.01014	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00839	0.02516	0.00839	0.01677	0.00839	0.01677	0.00000	0.00000					
0.05354	0.02677	0.08032	0.02677	0.02677	0.02677	0.00000	0.00000	0.00000	0.00000	0.00000	0.00861	0.16723	0.50169	0.16723	0.05017	0.02508	0.05017	0.00000	0.00000					
0.01431	0.00715	0.02146	0.00715	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00591	0.00487	0.00000	0.00487	0.00974	0.00487	0.00974	0.00000	0.00000					
0.01190	0.00595	0.01785	0.00595	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00590	0.01180	0.00000	0.00000	0.00000	0.00000					
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000					
0.13901	0.06690	0.20069	0.06690	0.03691	0.03691	0.00000	0.00000	0.00000	0.00000	0.96842	0.33732	0.48533	0.52685	0.20122	0.11815	0.03834	0.07668	0.00000	0.00000	**2.095**	**0.5819**	**0.2903**	5.26E-05	2.04E-05
0.54732							**1.30574**					**1.44656**												

PM_{10} Emission Burden Calculations

Equipment (> 50 hp)	#Hrs/day	Duration 1	Duration 2	Duration 3	1 (2021)	2 (2021)	3 (2021)	4 (2021)	5 (2021)	6 (2021)	7 (2022)	8 (2022)	9 (2022)	10 (2022)	11 (2022)	12 (2022)	13 (2022)	14 (2023)	15 (2023)	16 (2023)	17 (2023)	18 (2023)	19 (2024)	20 (2024)	21 (2024)	22 (2024)	23 (2024)	24 (2024)	25 (2024)	26 (2024)	HP	Emission Controls
Backhoe	7	75%	25%			6	6				2	2	2	2							4	4	4		2	2					100	0.15
Dump Truck	7	75%	75%	75%		6	10														8	8	8								*300*	0.15
Excavator	7	75%	75%	75%		6	10		1	1	1										8	8	8								160	0.15
Concrete Pump Truck	7	50%	50%	50%			1	1	1	1	1	1	1	1	1	1							1	1	1	1	1	1			300	0.15
Concreter Truck	7	50%	25%				20	20	20		3	3	3	3	3	3						1	20	20	20	3	3	3			300	0.15
Crane	7	50%	75%	25%						1	1	1	1	1								1	1		1	1	1	1			240	0.15
Compactor	7	25%	25%	25%							3	3	3	3											3	3					50	0.15
Pile Driver	7	25%	25%	25%																											50	0.15
Duration (Days)						40	20	60	20	40	40	20	60	20	20	20	20	120	40	20	60	20	20	60	20	40	20	40	20	20	260	

Equipment (> 50 hp)	2021 PM10 g/hp-hr	2022 PM10 g/hp-hr	2023 PM10 g/hp-hr	2024 PM10 g/hp-hr	2021: 1	2021: 2	2021: 3	2021: 4	2021: 5	2021: 6
Backhoe	0.41007	0.381572	0.353253	0.32569	0.00000	0.00854	0.00427	0.00000	0.00000	0.00000
Dump Truck	0.64756	0.590015	0.536916	0.490453	0.00000	0.04047	0.03373	0.00000	0.00000	0.00000
Excavator	0.04165	0.03479	0.02642	0.02084	0.00000	0.00139	0.00116	0.00000	0.00012	0.00023
Concrete Pump Truck	0.14109	0.127683	0.115575	0.105182	0.00000	0.00000	0.00049	0.00147	0.00049	0.00098
Concreter Truck	0.03637	0.03232	0.02770	0.02385	0.00000	0.00000	0.00253	0.00758	0.00253	0.00000
Crane	0.06282	0.05359	0.04425	0.03591	0.00000	0.00000	0.00000	0.00000	0.00000	0.00052
Compactor	0.25465	0.244128	0.237122	0.232332	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pile Driver	0.19868	0.177599	0.157725	0.142547	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Stage Emissions Total (tons)					0.00000	0.05040	0.04217	0.00905	0.00313	0.00173
Yearly Emissions Total (tons)					**0.10649**					

7 (2022)	8 (2022)	9 (2022)	10 (2022)	11 (2022)	12 (2022)	13 (2022)	14 (2023)	15 (2023)	16 (2023)	17 (2023)	18 (2023)	19 (2024)	20 (2024)	21 (2024)	22 (2024)	23 (2024)	24 (2024)	25 (2024)	26 (2024)	*Worst Case Year (tons)*	*Daily Basis (g/s)*	*Yearly Basis (g/s)*	*Areawide Monthly Basis (g/s/m2)*	*Areawide Yearly Basis (g/s/m2)*
0.00265	0.00132	0.00397	0.00132	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00736	0.00245	0.00226	0.00000	0.00113	0.00226	0.00000	0.00000	0.00000	0.00000					
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.06711	0.02237	0.02044	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000					
0.00019	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00176	0.00059	0.00046	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000					
0.00089	0.00044	0.00133	0.00044	0.00044	0.00044	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00037	0.00110	0.00037	0.00073	0.00037	0.00073	0.00000	0.00000					
0.00067	0.00034	0.00101	0.00034	0.00034	0.00034	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00166	0.00497	0.00166	0.00050	0.00025	0.00050	0.00000	0.00000					
0.00045	0.00022	0.00067	0.00022	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00018	0.00015	0.00000	0.00015	0.00030	0.00015	0.00030	0.00000	0.00000					
0.00042	0.00021	0.00064	0.00021	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00020	0.00040	0.00000	0.00000	0.00000	0.00000					
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000					
0.00527	0.00254	0.00762	0.00254	0.00078	0.00078	0.00000	0.00000	0.00000	0.00000	0.07624	0.02569	0.02533	0.00606	0.00350	0.00419	0.00076	0.00153	0.00000	0.00000	**0.106**	**0.0465**	**0.0150**	4.20E-06	1.05E-06
0.01953							**0.10193**					**0.04138**												

$PM_{2.5}$ Emission Burden Calculations

Equipment (> 50 hp)	#Hrs/day	Duration 1	Duration 2	Duration 3	Year: 2021 Stage 1	2	3	4	5	6	2022 Stage 7	8	9	10	11	12	13	2023 Stage 14	15	16	17	18	2024 Stage 19	20	21	22	23	24	25	##	HP	Emission Controls	2021 PM2.5 g/hp-hr	2022 PM2.5 g/hp-hr	2023 PM2.5 g/hp-hr	2024 PM2.5 g/hp-hr	2021 Stage 1	2	3	4	5	6
Backhoe	7	75%	25%			6	6				2	2	2	2							4	4	4		2	2					100	0.15	0.39777	0.370125	0.342656	0.315919	0.00000	0.00829	0.00414	0.00000	0.00000	0.00000
Dump Truck	7	75%	75%	75%		6	10														8	8	8								*300*	0.15	0.62813	0.572315	0.520808	0.475739	0.00000	0.03926	0.03272	0.00000	0.00000	0.00000
Excavator	7	75%	75%	75%		6	10		1	1	1										8	8	8								160	0.15	0.04040	0.03375	0.02562	0.02022	0.00000	0.00135	0.00112	0.00000	0.00011	0.00022
Concrete Pump Truck	7	50%	50%	50%			1	1	1	1	1	1	1	1	1	1							1	1	1	1	1				300	0.15	0.13686	0.123853	0.112107	0.102027	0.00000	0.00000	0.00048	0.00143	0.00048	0.00095
Concreter Truck	7	50%	25%				20	20	20		3	3	3	3	3							1	20	20	20	3	3	3			300	0.15	0.03527	0.03135	0.02687	0.02313	0.00000	0.00000	0.00245	0.00735	0.00245	0.00000
Crane	7	50%	75%	25%						1	1	1	1	1								1	1		1	1	1	1			240	0.15	0.06094	0.05198	0.04293	0.03484	0.00000	0.00000	0.00000	0.00000	0.00000	0.00051
Compactor	7	25%	25%	25%							3	3	3	3											3	3					50	0.15	0.24701	0.236804	0.230009	0.225362	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pile Driver	7	25%	25%	25%																											50	0.15	0.19272	0.172271	0.152994	0.13827	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Duration (Days)						40	20	60	20	40	40	20	60	20	20	20	20	120	40	20	60	20	20	60	20	40	20	40	20	##	260		**Stage Emissions Total (tons)**					0.00000	0.04889	0.04091	0.00877	0.00304	0.00168
						360												260															**Yearly Emissions Total (tons)**					**0.10329**					

2022							2023					2024								Worst Case Year (tons)	Daily Basis (g/s)	Yearly Basis (g/s)	Areawide Monthly Basis (g/s/m2)	Areawide Yearly Basis (g/s/m2)
7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26					
0.00257	0.00129	0.00386	0.00129	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00714	0.00238	0.00219	0.00000	0.00110	0.00219	0.00000	0.00000	0.00000	0.00000					
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.06510	0.02170	0.01982	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000					
0.00019	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00171	0.00057	0.00045	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000					
0.00086	0.00043	0.00129	0.00043	0.00043	0.00043	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00035	0.00106	0.00035	0.00071	0.00035	0.00071	0.00000	0.00000					
0.00065	0.00033	0.00098	0.00033	0.00033	0.00033	0.00000	0.00000	0.00000	0.00000	0.00000	0.00009	0.00161	0.00482	0.00161	0.00048	0.00024	0.00048	0.00000	0.00000					
0.00043	0.00022	0.00065	0.00022	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00018	0.00015	0.00000	0.00015	0.00029	0.00015	0.00029	0.00000	0.00000					
0.00041	0.00021	0.00062	0.00021	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00020	0.00039	0.00000	0.00000	0.00000	0.00000					
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000					
0.00512	0.00246	0.00739	0.00246	0.00076	0.00076	0.00000	0.00000	0.00000	0.00000	0.07395	0.02492	0.02457	0.00588	0.00340	0.00407	0.00074	0.00148	0.00000	0.00000	**0.103**	**0.0445**	**0.0145**	4.03E-06	1.02E-06
0.01895							**0.09887**					**0.04014**												

Appendix H: Public Hearing Notices

- ***New York Post*** Advertisement
- ***El Diario*** Advertisement
- ***Queens Chronicle*** Advertisement
- Poster Announcement for Subway Stations and Bus Stops

NEW YORK POST

State of New York
COUNTY OF NEW YORK

SS:

0000141017-01

Rubicela Gonzalez being duly sworn,

says that he/she is the principal Clerk of the Publisher of the

New York Post

a daily newspaper of general circulation printed and published in the English language, in the County of New York, State of New York; that advertisement hereto annexed has been regularly published in the said "New York Post" once,

on the 5th of June, 2019

Rubicela Gonzalez

Sworn to before me on this 5 day of June, 2019

Notary Public

RICHARD C SAVIN
NOTARY PUBLIC - STATE OF NEW YORK
No. 01SA6304152
Qualified in Dutchess County
My Commission Expires May 27, 2022

EMPLOYMENT

PROFESSIONAL

Senior Covenant Analyst wanted by Covenant Review LLC, a research firm in New York City, NY, to review, analyze, and provide expert legal commentary on complex legal contracts and disclosure documents; including offering documents, indentures, and credit agreements; Write research reports summarizing and providing expert legal commentary on, contractual covenant terms and other provisions in complex legal contracts and disclosure documents governing high yield bonds; Write event-driven reports describing and providing expert legal analysis on the documentary implications of special situations, such as M&A transactions; Address client questions on high yield bond covenants and other high yield provisions. Requirements: Juris Doctor degree (or equivalent), currently licensed and in good standing with the New York State Bar Association, and six years of experience as a transactional lawyer working primarily on high yield bond and/or leveraged loan deals and documentation. Please send resume to Jennifer Dunbar, Office Manager, 25 W 45th Street, New York, NY 10036

Senior Logistics Specialist needed by tableware distrib co in New York, NY to lead price negotiations. Required: Bachelor's & 2 yrs exp & Japanese fluency. Resume to: HR Coord/Job Ref CK. Korin, Inc., 57 Warren Street, New York, NY 10007

Senior Program Associate (NY, NY). Manage & lead the organization of the National Chinese Language Conference. Telecommuting permitted. Must possess a Master's deg in Int'l Affairs, Public Admin, Communication, Education, or a rltd field & 2 yrs of conference program dvlpmt exp for Chinese lang or Chinese cultural events. Exp must incl the following skills/tools/technologies: communication mgmt, budget mgmt, organization training; event planing & mgmt; fundraising communication; Content Mgmt System (CMS) such as Drupal 8; website prgrmg lang such as HTML5; mobile App production process; & email mktg automation platform such as Mailchimp. Must also be fluent in Mandarin. Send resume to Attn: HR, Job Ref #: SPA2019, The Asia Society, 725 Park Ave, NY, NY 10021

Veterinary Radiologist (Brooklyn, NY) Interpret, report, and at times perform diagnostic imaging exams for radiography, ultrasound, CT, Fluoro and MRI; Requires DVM or equiv + rltd exp. Must have NY lic and BC. CV, Attn: Dr. Levitzke, Brooklyn Veterinary Emergency Svcs, 196 4th Ave, Brooklyn, NY 11217.

SALES

Sales: Oliver Wyman, Inc. Business Development Partner – FS/Insurance– New York, NY. Oversee & manage major sr client relationships & account planning. Req's Mast deg in Econ, Eng'g, Business Admin, Math, or rel quantitative field + 4 yrs of industry exp. Alternatively, Bach deg in Econ, Eng'g, Business Admin, Math, or rel quantitative field + 6 yrs of industry exp will qualify. Up to 50% domestic and international travel req'd for business meetings. Send resume identifying position to: Attn: AN (Business Development Partner – FS/Insurance), Oliver Wyman, Inc., 1166 Avenue of the Americas, 29th Fl, New York, NY 10036.

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nyc rentals 212-210-9206

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Kitchenette & Studio Rentals
Bklyn, Queens, Bronx, Manhattan
Single $800mo+ Couple $900mo+
nyc rentals 212-210-9206

All real estate advertising in this newspaper is subject to the Federal Fair Housing Act of 1968 as amended in 1988 which makes it illegal to advertise "any preference, limitation or discrimination based on race, color, religion, sex, handicapped, familial status, or national origin, or intention to make such preference, limitation or discrimination." To complain of discrimination, call HUD toll free at 1-800-669-9777. The toll free telephone for the hearing impaired is 1-800-927-9275. Or, call the Anti Discrimination of New York (the Fair Housing Agency for the 5 Boros of New York) at 718-422-0066, or The New York City Commission of Human Rights hotline at 212-306-7500.

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NOTICES

LEGAL NOTICES

Notice of formation of AKITA, LLC. Arts. of Org. filed with NY Secy. of State (SSNY) 04/24/2019. Location: Nassau County. SSNY designated for service of process and shall mail copy of process served against the LLC to Registered Agent: c/o AKITA, LLC, 624 Wayne Avenue, NHP, NY 11040. Purpose: any lawful purpose.

Notice is hereby given that a license, serial number pending for Beer and Wine Only has been applied for by the undersigned to sell Beer and Wine Only at retail in a restaurant under the Alcoholic Beverage Control Law at 270 Bleecker Street, the first floor, New York, NY 10014, for on-premises consumption:
Claypot 270, Inc.

NOTICES

LEGAL NOTICES

Notice is hereby given that a license, serial number 1318272 for Beer and Wine Only has been applied for by the undersigned to sell Beer and Wine Only at retail in a Bar/Tavern under the Alcoholic Beverage Control Law at 1720 Sheepshead Bay Road, Brooklyn, NY 11235 on-premises consumption:
Poke Stop Inc

PUBLIC NOTICE IS HEREBY GIVEN THAT ON MARCH 27, 2019 beginning at 11:00AM and continuing until all goods are sold, NYC Self Storage, Inc. will sell at public auction, under New York lien law for cash only, and on such succeeding days and times as may be necessary at 1053 Metropolitan Avenue, Brooklyn, NY 11211, the following goods: Wares, belongings and merchandise belongings to: SCOTT SHEPARD 9107, DANA POWELL 2203/2205, ANDREA RIVERA-CORONA 9013, EKPO EKPO 7508, 2003, 9355, ALEXIS HERNANDEZ 14108, CLARENCE VANTERPOOL 2308, DANIEL CIPRIANI 6704, NELSON ROCKEFELLER 6601, EUNIKA SIMMONS 2202/2224, KIMBERLY HORVATH 2019/1103
AUCTIONEER #097645

NOTICE OF PUBLIC AUCTION SALE OF COOPERATIVE APARTMENT COLLATERAL

PLEASE TAKE NOTICE: BY VIRTUE OF A DEFAULT UNDER A CERTAIN PROPRIETARY LEASE (THE "LEASE") BY AND BETWEEN ALBERTA L. THOMPSON (THE "LESSEE") AND MARK TERRACE OWNERS CORP. (THE "LESSOR"), COVERING APARTMENT 11I (THE "APARTMENT") LOCATED AT 3410 DEREIMER AVENUE, BRONX, NEW YORK, WHICH DEFAULT RESULTED IN THE TERMINATION OF THE LEASE, **WILLIAM MANNION, LICENSED AUCTIONEER (DCA# 796322) OR MATTHEW MANNION, LICENSED AUCTIONEER (DCA# 1434494)** WILL SELL THE 140 SHARES OF STOCK OF THE LESSOR (THE "SHARES") APPURTENANT TO THE APARTMENT AND ALL THE RIGHT, TITLE AND INTEREST IN AND TO THE LEASE AT PUBLIC AUCTION BEGINNING AT 12:00 P.M. ON JUNE 13, 2019 AT THE BRONX COUNTY COURTHOUSE, FRONT STEPS FACING GRAND CONCOURSE, 851 GRAND CONCOURSE, BRONX, NEW YORK 10451.

Apartment 11I, 3410 DeReimer Avenue Bronx NY 10475 and monthly maintenance $716.12.

THIS SALE IS HELD TO ENFORCE THE RIGHTS OF THE LESSOR AS A HOLDER OF A SECURITY INTEREST IN THE SHARES AND LEASE HEREIN DESCRIBED BASED UPON THE NON-PAYMENT OF MAINTENANCE, LATE CHARGES, ADMINISTRATIVE AND LEGAL FEES. THE LESSOR RESERVES THE RIGHT TO BID/PURCHASE AND REJECT ALL BIDS TO THE EXTENT THAT THE AMOUNT BID FOR THE APARTMENT IS NOT GREATER THAN THE AMOUNT OF THE PAST DUE SUM OWING ON THE APARTMENT. THIS SALE IS SUBJECT TO THE APPROVAL OF THE SUCCESSFUL BIDDER BY THE BOARD OF DIRECTORS OF THE LESSOR. A BANK OR CERTIFIED CHECK OR MONEY ORDER, PAYABLE TO SPOLZINO, SMITH, BUSS & JACOBS, LLP, ESCROW AGENT, (NO ENDORSED CHECKS OR ENDORSED MONEY ORDERS WILL BE ACCEPTED) IN AN AMOUNT EQUAL TO TEN PERCENT(10%) OF THE SUCCESSFUL BID, IS REQUIRED AT KNOCKDOWN TO PURCHASE THE APARTMENT. NO CASH WILL BE ACCEPTED. ALL FUNDS MUST BE EXHIBITED TO THE AUCTIONEER PRIOR TO THE COMMENCEMENT OF BIDDING, UNLESS PROPER FUNDS HAVE BEEN VERIFIED YOU WILL NOT BE PERMITTED TO BID. THE BALANCE OF THE SUCCESSFUL BID IS PAYABLE AT CLOSING WHICH SHALL BE HELD WITHIN FORTY-FIVE (45) DAYS OF THE AUCTION DATE, TIME BEING OF THE ESSENCE. FOR TERMS AND CONDITIONS CALL SPOLZINO, SMITH, BUSS & JACOBS, LLP AT (914) 476-0600 BETWEEN 3:00 - 5:00 P.M.

Public Hearing

Notice of Draft Environmental Impact Statement for the Proposed Reconstruction and Expansion of the Jamaica Bus Depot

The Metropolitan Transportation Authority/New York City Transit (MTA NYCT) has completed a Draft Environmental Impact Statement (DEIS) pursuant to New York State Environmental Quality Review Act (SEQRA) Article 8 of the New York State Environmental Conservation Law (ECL), and will be holding a Public Hearing on the proposed Reconstruction and Expansion of the Jamaica Bus Depot. The Proposed Action is located at 165-18 Tuskegee Airmen Way, Jamaica, New York 11433.

Description of Alternatives

The Proposed Action considered fifteen (15) design concepts which were originally identified in the Draft Scoping Document issued to the public in May 2016. The design concepts considered the potential bus flow and circulation configurations (e.g., bus wash, maintenance and fueling) and resulted in identifying seven (7) Potential Alternatives that met the future requirements for depot maintenance, operations and bus storage capacity. These Potential Alternatives were further evaluated in the Final Scoping Document issued in March 2019 and narrowed down to three (3) Candidate Alternatives. These Candidate Alternatives are further evaluated in the DEIS.

The distinguishing aspects among the three (3) Candidate Alternatives are as follows:

- CANDIDATE ALTERNATIVE A is referenced in the DEIS as PRINCIPALLY OPEN PARKING (all bus parking would be outdoors on the roof and in an unenclosed paved area);
- CANDIDATE ALTERNATIVE B is referenced in the DEIS as PARTIALLY OPEN PARKING (some bus parking would be outdoors on the roof, with the remainder of the bus parking indoors within an enclosed and climate-controlled area of the depot); and,
- CANDIDATE ALTERNATIVE D is referenced in the DEIS as PRINCIPALLY ENCLOSED PARKING (all bus parking would be indoors within an enclosed and climate-controlled area of the depot facility).

The three (3) Candidate Alternatives allow for a reasonable range of proposed alternatives to be considered for comparative engineering, economic, and environmental evaluation in the DEIS. Specifically, a range of bus storage capacity, capital and annual operational energy costs, and potential environmental effects are preliminarily represented by the extent of indoor/outdoor bus parking among the Candidate Alternatives.

The Draft Environmental Impact Statement is available on the MTA website at http://www.mta.info/ and hard copies of the DEIS document are available for public viewing at the following repositories:

- Queens Community Board 12 - 9028 161st Street, Jamaica, NY 11432
- Queens Central Library - 89-11 Merrick Boulevard, Jamaica, NY 11432
- South Jamaica Library - 10841 Guy R. Brewer Boulevard, Jamaica, NY 11433

A Public Hearing will be held to allow the public to comment on the DEIS.

Date, Time and Place of the Hearing

Thursday, June 27, 2019
Hearing begins at 6:30 p.m.
Registration is from 5:30 p.m. to 8:30 p.m.
Jamaica Center for Arts and Learning
161-04 Jamaica Avenue, Jamaica, NY 11432

Directions

By Subway: Ⓔ or ❶❷ train to Jamaica Center-Parsons Blvd./Archer Avenue. Walk ½ block North to Jamaica Avenue and one block east on Jamaica Ave.

Ⓕ train to Parsons Blvd: On Hillside Avenue, walk approximately three blocks south on Parsons Blvd. to Jamaica Ave., then turn left on Jamaica Ave. The Arts Center is one block to the east of Parsons Blvd. & Jamaica Ave.

By Bus: Q1, Q2, Q3, Q4, Q5, Q6, Q8, Q9, Q20A, Q20B, Q24, Q25, Q30 Q31, Q34, Q36, Q41, Q42, Q44SBS, Q54, Q56, Q65, Q76, Q77, Q83, Q84, Q85, Q110, Q111, Q112, Q113, Q114, N4, N4X, N6, N22, N24

Use ~~TripPlanner~~ at www.mta.info for specific directions.

For More Information, to Pre-Register to Speak, or to Submit Comments

Those wishing to be heard at the Public Hearing must register in advance either by calling 646-252-6777, on the MTA website, or in person at the hearing. Verbal presentations will be limited to three (3) minutes. You may present verbal testimony or submit written statements in lieu of, or to supplement, oral testimony concerning the Proposed Reconstruction and Expansion of the Jamaica Bus Depot. E-mail comments will be accepted online. Comments may also be submitted via postal mail to:

MTA Government & Community Relations
Attn: DEIS Proposed Reconstruction and Expansion of the Jamaica Bus Depot Public Hearing
2 Broadway, B20.81, New York, NY 10004

All written and online comments must be received by 5:00 PM, Friday, July 19, 2019. Comments received after this date and time will not be considered.

Accessibility and Interpreter Services

This Public Hearing has been scheduled at a location that is accessible to people with physical disabilities.

Interpreter and American Sign Language services will be available upon request in advance of registration no later than June 14, 2019, by calling the **Public Hearing Hotline at 646-252-6777. Representatives are available from 6 a.m. to 10 p.m. daily.** Customers who are hard of hearing or have speech disabilities should dial 711 for relay services and then ask to be connected to the Public Hearing Hotline to communicate with an agent to request a sign language interpreter.

Metropolitan Transportation Authority www.mta.info

AFFIDAVIT OF PUBLICATION

STATE OF NEW YORK

COUNTY OF NEW YORK

Ambika Mohan, being duly sworn, hereby declares and says, that she is the Advertising Account Executive responsible for the placing of advertisement for publication in the **El Diario** newspaper for Miller Advertising Agency Inc., located in New York, NY, and that the **Public Hearing for Jamaica Bus Depot** Legal Advertisement of which the annexed is a true copy, has been published in the said publication on the following issue date(s): **June 5, 2019**

Ambika Mohan

Subscribed to and Sworn before me

This **24th** day of **June, 2019**

Notary Public

DONNA PEREZ
NOTARY PUBLIC, STATE OF NY
01PE6151365
QUALIFIED IN NEW YORK COUNTY
MY COMMISSION EXPIRES AUGUST 14, 20 22

Audiencia pública

Aviso sobre el borrador del informe de impacto ambiental de la propuesta de reconstrucción y expansión de la terminal de autobuses de Jamaica

La Autoridad Metropolitana del Transporte/Autoridad de Tránsito de Nueva York (The Metropolitan Transportation Authority/New York City Transit, MTA NYCT) elaboró un Borrador del Informe de Impacto Ambiental (Draft Environmental Impact Statement, DEIS), conforme a la Ley Estatal de Revisión de la Calidad Ambiental (State Environmental Quality Review Act, SEQRA) de Nueva York, y al Artículo 8 de la Ley de Conservación Ambiental (Environmental Conservation Law, ECL) del Estado de Nueva York, y llevará a cabo una audiencia pública sobre la propuesta de reconstrucción y expansión del terminal de autobuses de Jamaica. La acción propuesta se encuentra en 165-18 Tuskegee Airmen Way, Jamaica, New York 11433.

Descripción de las alternativas

La acción propuesta consideró quince (15) conceptos de diseño que se identificaron originalmente en el Borrador del Documento de Especificaciones emitido al público en mayo de 2016. Los conceptos de diseño consideraron las posibles configuraciones de flujo y circulación de los autobuses (por ejemplo, lavado de autobuses, mantenimiento y abastecimiento de combustible) y resultaron en la identificación de siete (7) posibles alternativas que cumplían con los requisitos a futuro para el mantenimiento del terminal, las operaciones y la capacidad de almacenamiento de autobuses. Estas posibles alternativas se evaluaron con mayor detalle en el Documento de Especificaciones Final emitido en marzo de 2019 y se redujeron a tres (3) alternativas candidatas. Estas alternativas candidatas se evalúan con mayor detalle en el DEIS.

Los aspectos distintivos entre las tres (3) alternativas candidatas son los siguientes:

- La ALTERNATIVA CANDIDATA A se menciona en el DEIS como ESTACIONAMIENTO PRINCIPALMENTE ABIERTO (todos los estacionamientos de autobuses que se encuentran en el exterior, cubiertos y en un área pavimentada abierta);
- La ALTERNATIVA CANDIDATA B se menciona en el DEIS como ESTACIONAMIENTO PARCIALMENTE ABIERTO (algunos estacionamientos de autobuses que se encuentran en el exterior, cubiertos, con parte del mismo dentro de un área cerrada y climatizada del terminal); y,
- La ALTERNATIVA CANDIDATA D se menciona en el DEIS como ESTACIONAMIENTO PRINCIPALMENTE CERRADO (todos los estacionamiento de autobuses que se encuentran dentro de un área cerrada y climatizada del terminal).

Las tres (3) alternativas candidatas permiten considerar una variedad razonable de alternativas propuestas para la evaluación comparativa de ingeniería, económica y ambiental en el DEIS. En especial, una variedad de la capacidad de almacenamiento de autobuses, costos de capital, operativos y de energía al año y los posibles efectos ambientales se representan de manera preliminar por la extensión del estacionamiento interior o exterior de los autobuses entre las alternativas candidatas.

El borrador del informe de impacto ambiental está disponible en el sitio web de la MTA en: http://www.mta.info/ y las copias impresas del documento del DEIS están disponibles para visualización pública en los siguientes garajes:

- Queens Community Board 12 - 9028 161st Street, Jamaica, NY 11432
- Queens Central Library - 89-11 Merrick Boulevard, Jamaica, NY 11432
- South Jamaica Library - 10841 Guy R. Brewer Boulevard, Jamaica, NY 11433

Se llevará a cabo una audiencia pública para permitir que el público comente sobre el DEIS.

Día, hora y lugar de la audiencia
Jueves, 27 de junio de 2019
La audiencia inicia a las 6:30 p. m.
El registro comienza desde las 5:30 p. m. hasta las 8:30 p. m.
Jamaica Center for Arts and Learning
161-04 Jamaica Avenue, Jamaica, NY 11432

Indicaciones
En subterráneo: Línea E o J Z hacia Jamaica Center-Parsons Blvd./Archer Avenue. Camine ½ cuadra hacia el norte hasta Jamaica Avenue y una cuadra hacia el oeste en Jamaica Avenue.
Tren de la línea F hacia Parsons Blvd: En Hillside Avenue, camine aproximadamente tres cuadras hacia el sur en Parsons Blvd. hacia Jamaica Ave., luego gire hacia Jamaica Ave. The Arts Center está a una cuadra hacia el este de Parsons Blvd. & Jamaica Ave.
En autobús: líneas Q1, Q2, Q3, Q4, Q5, Q6, Q8, Q9, Q20A, Q20B, Q24, Q25, Q30 Q31, Q34, Q36, Q41, Q42, Q44SBS, Q54, Q56, Q65, Q76, Q77, Q83, Q84, Q85, Q110, Q111, Q112, Q113, Q114, N4, N4X, N6, N22, N24
Use TripPlanner+ en www.mta.info para obtener las indicaciones específicas.

Para obtener más información, para registrarse previamente como orador o para presentar comentarios
Aquellos que deseen ser escuchados en la audiencia pública deben registrarse con anticipación ya sea al llamar al 646-252-6777, en el sitio web de la MTA o en persona en la audiencia. Las presentaciones orales se limitarán a tres (3) minutos. Puede presentar testimonio oral o consignar declaraciones por escrito que puedan tomar el lugar, o complementar, cualquier testimonio oral relacionado con la propuesta de reconstrucción y expansión del terminal de autobuses de Jamaica. Los comentarios por correo electrónico se aceptarán en línea. También se pueden presentar los comentarios por correo a:

MTA Government & Community Relations
Attn: DEIS Proposed Reconstruction and Expansion of the Jamaica Bus Depot Public Hearing
2 Broadway, B20.81, New York, NY 10004

Todos los comentarios por escrito y en línea deben presentarse antes de las 5:00 p.m. del viernes 19 de julio de 2019. Los comentarios recibidos después de esta fecha y hora no serán considerados.

Accesibilidad y servicios de intérprete
Esta audiencia pública se ha programado en un lugar accesible para personas con discapacidades físicas.
Tendrá a su disposición los servicios de intérpretes y de lenguaje de señas americano si lo solicita antes del registro, es decir, antes del 14 de junio de 2019, llamando a la Línea de Asistencia para Audiencias Públicas al **Public Hearing Hotline at 646-252-6777. Línea de Asistencia para Audiencias Públicas al 646-252-6777. Los representantes están disponibles todos los días, de 6 a.m. a 10 p.m.** Los clientes con problemas de audición o discapacidades del habla deben marcar al 711 para obtener servicios de retransmisión y luego pedir que se les conecte a la línea directa de la Audiencia Pública para comunicarse con un agente y solicitar un intérprete de lenguaje de señas.

MTA Metropolitan Transportation Authority www.mta.info

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Ambika Mohan

Subscribed to and Sworn before me

This **24th** day of **June, 2019**

Notary Public

DONNA PEREZ
NOTARY PUBLIC, STATE OF NY
01PE6151365
QUALIFIED IN NEW YORK COUNTY
MY COMMISSION EXPIRES AUGUST 14, 2022

Public Hearing

Notice of Draft Environmental Impact Statement for the Proposed Reconstruction and Expansion of the Jamaica Bus Depot

The Metropolitan Transportation Authority/New York City Transit (MTA NYCT) has completed a Draft Environmental Impact Statement (DEIS) pursuant to New York State Environmental Quality Review Act (SEQRA) Article 8 of the New York State Environmental Conservation Law (ECL), and will be holding a Public Hearing on the proposed Reconstruction and Expansion of the Jamaica Bus Depot. The Proposed Action is located at 165-18 Tuskegee Airmen Way, Jamaica, New York 11433.

Description of Alternatives

The Proposed Action considered fifteen (15) design concepts which were originally identified in the Draft Scoping Document issued to the public in May 2016. The design concepts considered the potential bus flow and circulation configurations (e.g., bus wash, maintenance and fueling) and resulted in identifying seven (7) Potential Alternatives that met the future requirements for depot maintenance, operations and bus storage capacity. These Potential Alternatives were further evaluated in the Final Scoping Document issued in March 2019 and narrowed down to three (3) Candidate Alternatives. These Candidate Alternatives are further evaluated in the DEIS.

The distinguishing aspects among the three (3) Candidate Alternatives are as follows:

- CANDIDATE ALTERNATIVE A is referenced in the DEIS as PRINCIPALLY OPEN PARKING (all bus parking would be outdoors on the roof and in an unenclosed paved area);
- CANDIDATE ALTERNATIVE B is referenced in the DEIS as PARTIALLY OPEN PARKING (some bus parking would be outdoors on the roof, with the remainder of the bus parking indoors within an enclosed and climate-controlled area of the depot); and,
- CANDIDATE ALTERNATIVE D is referenced in the DEIS as PRINCIPALLY ENCLOSED PARKING (all bus parking would be indoors within an enclosed and climate-controlled area of the depot facility).

The three (3) Candidate Alternatives allow for a reasonable range of proposed alternatives to be considered for comparative engineering, economic, and environmental evaluation in the DEIS. Specifically, a range of bus storage capacity; capital and annual operational energy costs; and potential environmental effects are preliminarily represented by the extent of indoor/outdoor bus parking among the Candidate Alternatives.

The Draft Environmental Impact Statement is available on the MTA website at http://www.mta.info/ and hard copies of the DEIS document are available for public viewing at the following repositories:

- Queens Community Board 12 - 9028 161st Street, Jamaica, NY 11432
- Queens Central Library - 89-11 Merrick Boulevard, Jamaica, NY 11432
- South Jamaica Library - 10841 Guy R. Brewer Boulevard, Jamaica, NY 11433

A Public Hearing will be held to allow the public to comment on the DEIS.

Date, Time and Place of the Hearing
Thursday, June 27, 2019 *(REVISED DATE)*
Hearing begins at 6:30 p.m.
Registration is from 5:30 p.m. to 8:30 p.m.
Jamaica Center for Arts and Learning
161-04 Jamaica Avenue, Jamaica, NY 11432

Directions
By Subway: E or J Z train to Jamaica Center-Parsons Blvd /Archer Avenue. Walk ½ block North to Jamaica Avenue and one block east on Jamaica Ave

F train to Parsons Blvd: On Hillside Avenue, walk approximately three blocks south on Parsons Blvd. to Jamaica Ave., then turn left on Jamaica Ave. The Arts Center is one block to the east of Parsons Blvd & Jamaica Ave

By Bus: Q1, Q2, Q3, Q4, Q5, Q6, Q8, Q9, Q20A, Q20B, Q24, Q25, Q30 Q31, Q34, Q36, Q41, Q42, Q44SBS, Q54, Q56, Q65, Q76, Q77, Q83, Q84, Q85, Q110, Q111, Q112, Q113, Q114, N4, N4X, N6, N22, N24

Use **TripPlanner** at www.mta.info for specific directions.

For More Information, to Pre-Register to Speak, or to Submit Comments
Those wishing to be heard at the Public Hearing must register in advance either by calling 646-252-6777, on the MTA website, or in person at the hearing. Verbal presentations will be limited to three (3) minutes. You may present verbal testimony or submit written statements in lieu of, or to supplement, oral testimony concerning the Proposed Reconstruction and Expansion of the Jamaica Bus Depot. E-mail comments will be accepted online. Comments may also be submitted via postal mail to:

MTA Government & Community Relations
Attn: DEIS Proposed Reconstruction and Expansion of the Jamaica Bus Depot Public Hearing
2 Broadway, B20 81, New York, NY 10004

All written and online comments must be received by 5:00 PM, Friday, July 19, 2019. Comments received after this date and time will not be considered.

Accessibility and Interpreter Services
This Public Hearing has been scheduled at a location that is accessible to people with physical disabilities.

Interpreter and American Sign Language services will be available upon request in advance of registration no later than June 14, 2019, by calling the **Public Hearing Hotline at 646-252-6777. Representatives are available from 6 a.m. to 10 p.m. daily.** Customers who are hard of hearing or have speech disabilities should dial 711 for relay services and then ask to be connected to the Public Hearing Hotline to communicate with an agent to request a sign language interpreter.

Metropolitan Transportation Authority www.mta.info

MILA-078095

PHOTOS COURTESY GREATER WOODHAVEN YARD SALE

Giant W'dhaven Yard Sale

After a year off, the Great Woodhaven Yard Sale is back.

More than 50 families have signed up for community-wide sidewalk sale next Saturday, June 8, according to Vance Barbour, who started the event six years ago.

The Great Woodhaven Yard Sale was inspired by the famed mass yard sale that stretches nearly 700 miles along US Route 127 through six Midwestern states during one weekend in August, Barbour said.

His hope, he said, is to some day expand the event into surrounding neighborhoods to create "one huge Queens sale."

People still have time to sign up for the event at the Great Woodhaven Yard Sale Facebook page, where shoppers can also find all the addresses of the yard sales.

The sale was moved from September to June, starting this year.

-- Michael Shain

Pre-K schools

continued from page 4

Early Learning Center, Corona Friends School and The Learning Tree.

"The outcomes of negotiations [for new contracts] will have a critical and far reaching impact on low resourced communities," the letter read. "In many cases, the impact determines if our doors remain open for free Pre-K."

Among the group's complaints are that the contracts:

- make no provision for increases over the five-year life of the agreements;
- do not provide a minimum payment so that schools, which are paid on a per-pupil basis, can cover basic costs like salaries and rents even if they lose students during the year; and
- are not enough for pay parity for private pre-K teachers with those in public schools.

Alice Mulligan, a Brooklyn pre-K administrator who spearheads CBOs for Equity, said its complaints pushed the DOE to extend the filing deadline by two weeks in order to modify some of the contract's provisions.

"Happily, we have made some headway in rapport building," she said. "They understand now that we can't survive back-to-back years of deficits."

Public Hearing

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A Public Hearing will be held to allow the public to comment on the DEIS.

Date, Time, and Place of the Hearing

Tuesday, June 27, 2019
Hearing begins at 6:30 p.m.
Registration is from 5:30 p.m. to 8:30 p.m.

Jamaica Center for Arts and Learning
161-04 Jamaica Avenue, Jamaica, NY 11432

Directions

By Subway: E or J Z train to Jamaica Center-Parsons Blvd./Archer Avenue. Walk ½ block North to Jamaica Avenue and one block east on Jamaica Ave.

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Use **TripPlanner+** at **www.mta.info** for specific directions, including express bus routes.

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Metropolitan Transportation Authority

mta.info

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Appendix I: Transcript of Public Hearing and Written Comments Received

Metropolitan Transportation Authority
New York City Transit

State of New York

Public Hearing on the Draft Environmental Impact Statement on the Proposed Reconstruction of Jamaica Bus Depot

Jamaica Center for Arts and Learning
161-04 Jamaica Avenue, Jamaica, NY 11432

June 27, 2019

Moderator: Lucille Songhai, Hearing Officer Assistant Director, MTA New York City Transit

Metropolitan Transportation Authority
New York City Transit

State of New York

Public Hearing on the Draft Environmental Impact Statement on the Proposed Reconstruction of Jamaica Bus Depot

Jamaica Center for Arts and Learning
161-04 Jamaica Avenue, Jamaica, NY 11432

June 27, 2019

Dais Appearance

George Menduina
VP and CFO, MTA Bus Co.

John Decker
Senior Director, NYC Transit

Emil Dul
Principal Engineer, NYC Transit

Garth McIntosh
Director of Planning, NYC Transit

Mary Kong
SSS IV, NYC Transit

Jackie Bruce
Chief Budget Officer, MTA Bus Co.

Metropolitan Transportation Authority

New York City Transit

State of New York

Public Hearing on the Draft Environmental Impact Statement on the Proposed Reconstruction of Jamaica Bus Depot

Jamaica Center for Arts and Learning

161-04 Jamaica Avenue, Jamaica, NY 11432

June 27, 2019

	Name	*Affiliation*
1.	Michelle Keller	Queens CB 12, Transportation Chair
2.	Yvonne Reddick	Queens CB 12, District Manager
3.	Delores Sharp	Private Citizen
4.	Mark Henry	Private Citizen

[Hearing Convened, June 27, 2019 at 6:37 PM]

MS. LUCILLE SONGHAI: Good evening everyone. Thank you for coming. My name is Lucille Songhai. I'm an Assistant Director of Government Relations at MTA New York City Transit. I will serve as the hearing officer for tonight's public hearing. This public hearing provides the public with the opportunity to comment on the draft Environmental Impact Statement for the proposed reconstruction of the Jamaica Bus Depot.

To promote this meeting, hard copies of the draft Environmental Impact Statement were sent to Queens Community Board 12, the Queens Central Library, and the South Jamaica Library. Notices announcing this meeting were posted on the MTA website, new.mta.info. They were e-mailed and mailed to local elected officials and other interested parties and stakeholders. The EIS is available also on the MTA website.

If you haven't already done so, you may fill out a comment card at the registration table outside at the auditorium. Community stakeholders are also encouraged to submit written comments via our website or by mail and they can be sent to Amal Dahl [phonetic] right here. Can you raise your hand Amal? The

due date for receiving any comments by the public is July the 19th.

If you have any written comments that you would like to submit this evening, please drop them off at the information table right outside the auditorium. This proceeding will consider all comments but tonight, we are here to just listen. All comments, spoken statements presented tonight, all correspondence, all e-mails received and all comment cards will be considered in preparing the final Environmental Impact Statement and a response to comments.

Before we begin, I'd like to briefly expain -- explain the procedures for tonight's meeting. First, I will call the names of people who registered to speak in the order in which they signed up. Right now, we have one person. If you wish to speak tonight, please fill out a registration form at the registration table outside of the auditorium in the foyer. You have until 8:30 this evening to sign up to speak or to give comments.

I will be calling out names one speaker at a time. When I call your name, please come to the microphone in the front right here. When you begin your comments, please state your name and your affiliation so that we may hear from all interested parties tonight. Your remarks should not exceed three minutes. There will be a visual timer down below to alert you that you have 30

seconds left in your speaking time. If you run out of time, you may submit written comments online to supplement your oral testimony.

This public hearing is accessible to people who are mobility impaired and now I would like to introduce some of the staff members that are seated next to me this evening. We have John Decker. John, raise your hand. He is the Senior Director of MTA New York City Transit. We have Amal Dahl over here who is our Principal Engineer. We have Garth MacIntosh [phonetic] who is Director of Planning for New York City Transit and then we also have Mary Kong who is another one of our Engineers.

For the record, the date is Thursday, June 27, 2019. The time is now 6:37 p.m. and the public meeting and site of this hearing this evening is the Jamaica Center for Arts and Learning located at 161-04 Jamaica Avenue in Jamaica Queens, New York. Zip code 11432. We will now hear directly from the public with any public statements. First up is Michelle Keller. Okay. So when Ms. Keller comes back, she will be able to give her comments. Thank you. Right now, we'll take a recess. Thank you. We're going into recess at 6:38 p.m. just for the transcript. Thank you.

[OFF THE RECORD]

[ON THE RECORD]

MS. SONGHAI: We are re-, testing. Hello? Thank you. We are resuming the public hearing at 6:40 p.m. Our first speaker is Michelle Keller. Please state your name and your affiliation.

MS. MICHELLE KELLER: Alright. Good evening ladies and gentlemen. My name is Michelle Keller. I am the Transportation Chairperson for Community Board 12 and I'm here to give our position on the Jamaica Bus Depot on Merrick Boulevard. Back in 2015 I believe it was under Simone Price, she came with a presentation about the proposals on the new depot. Hello? Can you hear me now?

MS. SONGHAI: Uh-huh.

MS. KELLER: Okay. Again, Simone Price who was a representative of MTA, the I guess the anti-governmental liaison. She came and made a presentation and at that time, we discussed the three different options and we told her we really want the enclosed one and the reason being is that in that area you have two to three senior citizen buildings there and they're overwhelmed with the car wash, with the cars idling waiting to get their cars washed, the buses. It's a heavily traveled corridor. You have auto repair shops as well so I think it would be deleterious to the people that live in that area to have an open depot there so we are requesting that you do have

the, the new facility have it enclosed. Okay. Thank you.

MS. SONGHAI: Thank you. We are now gonna head back into recess since we have no additional speakers. The time is now 6:42. Thank you.

[OFF THE RECORD]

[ON THE RECORD]

MS. SONGHAI: We are now resuming the public hearing at 6:53 p.m. and our next speaker is going to be Delores Sharp. Please come up to the microphone, state your name and affiliation to this project. Thank you.

MS. DELORES SHARP: Okay. Good evening everyone. My name is Delores Sharp. I am a resident of 165th Street. My property directly abuts the bus depot and my concern, my major concern because this is really going to be a, a impactful decision for the community is how will it really impact those of us that live on that block. What kind of, you know, inconveniences is it gonna cause for us as parking to go in and out of our block. Just being in our, in our back yard. How is it going to impact us as far as safety, health concerns, the full gambit? That's really all that I want to say. Okay. That's it.

MS. SONGHAI: Thank you. We're now going back on recess at 6:54 p.m. Thank you.

[OFF THE RECORD]

[ON THE RECORD]

MS. SONGHAI: We are resuming the public hearing at 7:02 p.m. Our next public speaker is Yvonne Reddick [phonetic]. Please state your name and affiliation.

MS. YVONNE REDDICK: Yes, that's good. Good evening. I'm Yvonne Reddick, District Manager for Community Board 12. I would like to say that my concerns are and I will say in speaking on behalf of the residents, the impact, concern about the impact that it will have on the resident when this building is under construction. We have to take into consideration the noise, the hours, and how many days that the contractor will be working and definite take into consideration the seniors. You have as the transportation chairperson mentioned, you have the senior development right adjacent to the depot and that you definitely have to second to consideration the time, the hours, and the days and right in the next block 108, you have a school. You have to take into consideration too the impact of the noise how it will affect the school, hours, the children. And once again, most of all, the seniors. We're concerned about the seniors. And I think before this project begin, we're gonna have to do more outreach to the surrounding community and the adjacent homeowners and hopefully we all, the Community Board, will work closely with you regarding outreach to the community.

Thank you.

MS. SONGHAI: Thank you. We're now headed back into recess at 7:05 p.m.

[OFF THE RECORD]

[ON THE RECORD]

MS. SONGHAI: We are resuming the public hearing at 8:20 p.m. We have our next speaker. Please speak your name and affiliation.

MR. MARK HENRY: Mark Henry of ATU Local 1056, President, Amalgamated Transit Union, Local 1056. I can go ahead?

MS. SONGHAI: Yes.

MR. HENRY: Oh, okay. I'm here just to comment on the three options that were there for Jamaica Depot sorely needed for the community at large. Either one of the properties would probably be beneficial to the community from my standpoint as a, as a operator and a president of the local. My only concern is just once you increase the capacity of the location, is the impact of where our operators would be able to park in regards to that facility. I know most of the spaces designated for buses, bus service, articulated service or express bus service which is sorely needed in the community but once you increase the size that means more employees will be generated to that location and the hours of operation require these individuals

have some place to, to, to, to park their vehicles if they do take public transporta-, if they don't take public transportation to report to work.

From what I was described in the presentation that was outside, I think it's pretty well thought out. Most of the, the work that was involved with it did read some of the environmental work and I really don't oppose either one of the projects. I think I'm more partial to the I think it was the B design. B as in boy. Yes. And that ends my testimony.

MS. SONGHAI: Thank you.

MR. HENRY: You're welcome.

MS. SONGHAI: We're now going back on recess. The time is 8:23 p.m.

[OFF THE RECORD]

[ON THE RECORD]

MS. SONGHAI: The public hearing has now concluded at 8:30 p.m. Thank you.

[Hearing Adjourned, June 27, 2019 at 8:30 PM]

****

CERTIFICATE OF ACCURACY

STATE OF NEW YORK

SS:

COUNTY OF NEW YORK

I, Gregory Woltman, Project Manager at Geneva Worldwide, Inc., certify that the foregoing transcript of proceedings on the Draft Environmental Impact Statement on the Proposed Reconstruction of the Jamaica Bus Depot, was prepared using the required transcription equipment and is a true and accurate record of the proceedings to the best of my abilities and belief.

This certificate is issued by Geneva Worldwide, Inc.
256 West 38TH Street, 10th Floor, New York N.Y. 10018.

Certified By _____

Sworn to and subscribed before me
This 29 day of July 2019

_____
Notary Public

Craig Buckstein
Notary Public
State of New York
Qualified in New York County
01BU6049904
Commission Expires 10/23/2022

Metropolitan Transportation Authority

State of New York

MTA New York City Transit Public Hearing on the DEIS for the Proposed Reconstruction & Expansion of the Jamaica Bus Depot

Held at The Jamaica Center for Arts and Learning

161-04 Jamaica Avenue, Jamaica, NY 11432

June 27, 2019

EMAILS & WRITTEN COMMENTS

Metropolitan Transportation Authority

State of New York

MTA New York City Transit Public Hearing on the DEIS for the Proposed Reconstruction & Expansion of the Jamaica Bus Depot

EMAILS & WRITTEN COMMENTS

E-MAIL from Michele Keller from Community Board #12

I am submitting my position on the new construction for the Jamaica Bus Depot. As stated at the hearing on June 27, 2019, Community Board 12's Transportation Committee support the building of a new enclosed structure to house the buses. Our concerns for the residents contiguous to the depot's site is priority.

The corridor where the depot is currently located is heavily travelled causing an increase of air pollutants from vehicles, buses, trucks and existing auto repair shops and car wash businesses. All of which have adverse health impact on our constituents subjected to these conditions. In particular, the Greater Allen Cathedral Senior Residence which has 109 units (Section 202 Supportive Housing for the Elderly Program) complex is adjacent to the depot.

It is my understanding your agency met with the residents at IS 8 Middle School in the last two years and heard their concerns as well.

I do hope that MTA will take into consideration Community Board 12 and its constituents recommended input and concerns when making its decision to build the new bus depot.

I look forward to working with MTA in the future.

Sincerely,

Michele Keller
Community Board 12
Transportation Committee Chairwoman

WRITTEN COMMENTS

from Council Member 27th Dist.,Queens - I. Daneek Miller

(see attached)

DISTRICT OFFICE
172-12 LINDEN BLVD.
ST. ALBANS, NY 11434
(718) 776-3700
FAX: (718) 487-3580

CITY HALL OFFICE
250 BROADWAY, SUITE 1810
NEW YORK, NY 10007
(212) 788-7084
FAX: (212) 788-7093

idmiller@council.nyc.gov

THE COUNCIL
OF
THE CITY OF NEW YORK

I. DANEEK MILLER
COUNCIL MEMBER, 27TH DISTRICT, QUEENS

CHAIR
CIVIL SERVICE AND LABOR

COMMITTEES
IMMIGRATION
LAND USE
PUBLIC SAFETY
TRANSPORTATION

SUB-COMMITTEE
LANDMARKS, PUBLIC SITING
AND MARITIME USES

July 18, 2019

Patrick J. Foye
Chairman and CEO
Metropolitan Transportation Authority
2 Broadway, New York, NY 10004

Dear Chairman Foye,

I write today to express the position of our Southeast Queens community on the Metropolitan Transit Authority (MTA) New York City Transit (NYCT) Draft Environmental Impact Statement for the proposed action for reconstruction and expansion of the Jamaica Bus Depot.

After careful consideration of each "preferred alternative," we propose the implementation of Candidate Alternative D- Principally Enclosed Parking. We believe this alternative would demonstrate maximum potential in terms of minimizing adverse effects to the community as well as meeting all necessary MTA Unified Planning and Design Guidelines. Additionally, Candidate Alternative D will improve access for Southeast Queens commuters and maximize community standards.

For context, the NYCT Jamaica Bus depot currently houses several of the buses with the borough's busiest routes. Included among the bus lines that terminate in the Downtown Jamaica Area, are nearly all of Southeast Jamaica's local buses. The abysmal state of the current Jamaica Bus Depot has resulted in the lack of space to store the approximately 200 buses assigned there, as many of these vehicles are forced to be parked on adjacent public streets.

By every measure, we believe a principally enclosed parking in the form of Candidate Alternative D will be the best option for the Southeast Queens community to enhance the quality and availability of public transit in these areas. This alternative would provide an administrative building and a main depot consisting of two buildings that would offer 338 SBE parking spaces. The three fueling lanes, three bus wash lanes, and 15 maintenance bays will maximize operations. The inclusion of a 20 foot security/sound barrier adjacent to the residential neighborhoods will minimize adverse impacts on the community. With several exits for buses, there will be a significant decrease of congestion in the area.

If this alternative is implemented, in the 48 month construction period it proposes to construct the first building between the existing building and Merrick Boulevard. This will prevent interruption of bus operation and maintenance by transferring to the new building once completed, and then demolishing the existing building for construction of Building B.

With a record of decades of persistent neglect for transportation equity in Southeast Queens, the revitalization of the nearly eighty year old NYCT Jamaica Bus Depot will serve to alleviate some of the hardships of commuters and improve frequency of service in Southeast Queens.

We trust that you will give careful deliberation to our proposal in order to meet the transportation needs of our constituents and provide relief to the current state of disrepair. We also hope that the construction may be provided every resource required to expedite the effort and possibly reduce the 48 month construction timeline.

Thank you for your consideration.

Sincerely,

I. Daneek Miller
Council Member, District 27, Queens

Metropolitan Transportation Authority

State of New York

ON-LINE COMMENTS

MTA New York City Transit Public Hearing on the DEIS for the Proposed Reconstruction & Expansion of the Jamaica Bus Depot

Held at The Jamaica Center for Arts and Learning
161-04 Jamaica Avenue, Jamaica, NY 11432
June 27, 2019

Metropolitan Transportation Authority
State of New York

MTA New York City Transit Public Hearing on the
DEIS for the Proposed Reconstruction & Expansion of the Jamaica Bus Depot

Held at The Jamaica Center for Arts and Learning
161-04 Jamaica Avenue, Jamaica, NY 11432
June 27, 2019

ON-LINE COMMENTS

Norm Miller, 06/21/19 11:46 a.m.

The Jamaica Bus Depot is the oldest bus depot in the MTA. It needs to be heavily renovated so that it can not only can maintain and store local standard buses but also articulated accordion buses. Also, the Q5 and Q85 should become +SBS routes.

* * * *