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MTA Headquarters   IMMEDIATE

MTA Announces 8 Winners of MTA Genius Transit Challenge

Winning Ideas to be Immediately Researched and Tested by New York City Transit Staff

Winning Ideas Seek to Improve Subways Signals, Capacity and Communications

Video and Website with Information on Winning Proposals are Online; Photos from Ceremony Available Here

MTA, Partnership for New York City Launch Joint Venture to Continue Innovation Inspired by Genius Challenge

The Metropolitan Transportation Authority (MTA) today announced eight winners of the MTA Genius Transit Challenge, including two who plan to immediately reinvest their cash awards from the competition and contribute seed money to advance their ideas in conjunction with the MTA. As part of a wide-ranging effort to upgrade the subway system's capacity and reliability, all the winning ideas will be thoroughly vetted and further developed as quickly as possible with future procurements subject to any required MTA Board approval.

Given the urgent need to effectuate near term change, the Genius Transit Challenge sought innovative ideas to rapidly modernize the New York City subways signal systems, procure new state-of-the-art subway cars and bring connectivity to underground tunnels and trains. The eight winners were chosen for their ability to deliver quickly maximum positive impact on subway service and customer experience. In some categories, judges gave out multiple awards because more than one proposal had significant promise, or because two proposals utilized similar technological strategies.

Prior to the Genius Challenge, estimates for modernizing the New York City subway signal system ranged from 40 to 50 years, with a cost of tens of billions of dollars. Governor Andrew M. Cuomo declared the status quo to be unacceptable and challenged the MTA to launch the Genius Challenge to find better solutions. With the ideas recognized today as winners of the Genius Challenge, NYC Transit has the potential to cut that timeline dramatically and the cost significantly, delivering modern signal technology to a century-old subway system.

Winning submissions in the signals category offer the possibility of modernizing NYC Transit's antiquated signal system far faster and more cost-effectively than previously estimated, reducing installation and implementation time by decades. Customers would see faster, more reliable and far more frequent service across subway lines, lessening crowding conditions in cars and platforms and decreasing commute times. The winners were:

- **Metrom Rail** and transportation engineer **Robert James** separately submitted proposals using ultra-wideband (UWB) wireless technology, a next-generation technology that eliminates expensive, cumbersome equipment for signaling systems and provides accuracy for subway car locations down to centimeters.
- **Ansaldo STS** and **Thales Group** separately proposed using onboard sensors and cameras for train positioning that would eliminate the need for cumbersome wayside equipment and maintain safety, reduce delays and mitigate costs.

Similarly, the winners of the subway car challenge proposed radically new approaches to loading guidelines, designing and building new modern subway cars for NYC Transit. They would potentially cut years from development, procurement and delivery schedules:

- **CRRC**, the largest train car producer in the world, proposed an investment of $50 million of their own money to develop a new subway car for MTA NYC Transit using lighter materials, modular design; and modern train control technology.
- **Craig Avedisian**, a lawyer by day and a transit enthusiast at all other hours, who proposed using longer trains to increase capacity and changing passenger loading procedures to accommodate the extra cars in stations.
- **CSinTrans** proposed a software platform that would capture subway car diagnostic data and transmit the information to maintenance crews to address potential problems faster or cut down response times to breakdowns.

The third challenge sought innovative methods to upgrade the subway system's communications and control technology with the goal of increasing service throughput and capacity. Improving train communications, particular in underground track tunnels where networks have sporadic coverage, provides multiple benefits to operations managers, employees and customers. Dispatchers and train crews can make better informed decisions during emergencies and communicate service changes to customers, while customers get the added benefit of connectivity in tunnels between subway stations. The winning idea would speed up maintenance, repairs and installations of communications systems by freeing up manned crews to address other, more complex work:

- **Bechtel Innovation** proposed a semi-automatic robotic system to install communications and control infrastructure in subway tunnels. The company plans to reinvest its $500,000 cash award from the competition to a dedicated internal group that will work with the MTA to develop specifications for such a robotic system.

The judges also recognized two honorable mentions in the communications category in respect to their strong technical solutions, to Transit Wireless and Alcatel-Lucent, as discussed further below.

"People from around the world delivered groundbreaking solutions that truly represent a new wave of innovation for the MTA, and we are more excited than ever about the future of New York Subways," said Joe Lhota, MTA Chairman.

"When Governor Cuomo announced his Genius Challenge last summer, I'm not sure any of us really knew what the reaction would be. The Governor's idea was to accelerate changes to subway signal systems by tapping into the most creative minds and the latest technologies. The bet paid off, and now the MTA can move forward much faster than the previous 40-plus year timetable to give New York subway riders a modern, high-capacity signal system," said Janno Lieber, MTA Chief Development Officer.

"New York is committed to growing a robust economy supported by diverse, livable communities. Our ability to get people where they need to go quickly, safely, and efficiently is vital to that mission. The subway system is the economic engine of New York City and the metropolitan region, and today's winning submissions to the Genius Challenge will help modernize our aging infrastructure and support a 21st century subway system for a 21st century economy," said Howard Zemsky, Empire State Development Corporation President, CEO, and Commissioner.

Transit Innovation Partnership
In the spirit of the creative solutions and innovations that sprung from the competition, the MTA and the Partnership for New York City have launched the Transit Innovation Partnership (TIP), a public-private collaboration dedicated to bringing new ideas, resources and expertise to support the MTA's mission and improve customer experience. The Partnership for New York City has committed $1.5 million to launch this initiative. MTA President Pat Foye will work with Rachel Haot, Governor Cuomo's former chief digital officer who will lead TIP as its executive director. TIP's advisory board, chaired by Alan Fishman, will comprise leaders of business, civic, high tech and transit advocacy organizations that are committed to MTA's growth and success. A list of the advisory board members is included below.

"Public transit is critical to New York City's future. Through strategic innovation and private sector support, we have an opportunity to establish the MTA as a global leader in transit. We look forward to building on the success of the Genius Challenge to realize the potential of the MTA," said Rachel Haot, Executive Director, Transit Innovation Partnership.

"Governor Cuomo and the new leadership team at the MTA have created an unprecedented opportunity for business and the nonprofit sectors to put their expertise to work to help transform our regional transit system. We intend to build on the success of the Genius competition to make this the greatest system in the world," said Kathryn Wylde, President and Chief Executive Officer, Partnership for New York City.

"The Genius Challenge has shown us that an open forum for bold and creative ideas is the way forward for our transit system. I look forward to tapping into the expertise of the Transit Innovation Partnership, and working to foster a spirit of innovation and collaboration that will carry our public transit system into the 21st century and beyond," said Pat Foye, MTA President.

Genius Challenge Process
Of the 438 submissions, almost a quarter came from international applicants, and nearly half of the proposals are not in current commercial use. Applications came from a wide range of individuals, businesses, non-profits and higher education institutions, including student proposals. Substantial participation came from transit enthusiasts outside of the MTA, as well as a range of firms from non-transit industries.

The Genius Challenge was launched in June 2017. Participants were asked to submit strategies for any of three challenges: improving the signal system; increasing service capacity and reliability; and identifying ways to quickly deploy modern train communications and control technology across the system. A panel of technology and transportation experts, aided by an evaluation committee of MTA staff and experts from academia and transit industries, reviewed 438 submissions from 23 countries. The panel narrowed the submissions to 64 semifinalists, then further down to 19 finalists.

"It is critically important for government agencies to remember that sometimes, the best ideas come from the outside. I commend Governor Cuomo and the MTA on completion of a successful Genius Challenge. The contest succeeded in doing exactly what it set out to do -- inspire new ideas for how to solve the very old problem of modernizing the New York City Subway. I also congratulate the winners for coming up with new concepts in cars, communications and signals technology -- concepts that will assist this system and likely many others across the country," said Sarah Feinberg, MTA Genius Challenge judge and former administrator of the Federal Railroad Administration.

"It was a privilege and an honor to participate in Governor Cuomo's MTA Genius Challenge as a judge. As an engineer, I was impressed with the large number of innovative and carefully-thought out proposals the MTA received. The Challenge energized and unleashed the ingenuity of individuals as well as established companies, and the winners represent the most creative solutions to a societal challenge," said Balaji Prabhakar, MTA Genius Challenge judge and a professor of electrical engineering and computer science at Stanford University.

"The MTA Genius Challenge was an innovative way to get the best and brightest to help upgrade the subway faster and cheaper. Congratulations to MTA, the entrants and winners of this first of a kind competition," said Kristina Johnson, MTA Genius Challenge judge and chancellor-elect of the State University of New York.

"As president of New York City Transit, I am committed to upgrading and modernizing this transit system from top to bottom and a top priority is modernization of the subway signal system. A modern signal system is the key to running more trains, to driving up reliability and to increasing network capacity. I have directed my staff to research and engage in all of these ideas, whether it is ultra-wideband technology or new installation techniques. But we cannot rest on the laurels of these winners, which is why the MTA and the Partnership for New York City are launching the Transit Innovation Partnership, a public-private collaboration dedicated to bringing new ideas, resources, and expertise to support the MTA's mission," said Andy Byford, MTA New York City Transit President.

More information on the challenges and the details of the winning ideas are available on the Genius Challenge website.

Full Description of Winners
Challenge 1: Signaling

Challenge 1 sought to accelerate the deployment of modern train signaling technologies in the subway system, to increase the number of trains at peak periods and promote faster and more reliable service. The panel chose two winning ideas, split between four winners, with joint awards going to applicants with nearly identical entries. Each will receive a $250,000 award.

- Winner 1: Revolutionize signaling deployment using ultra-wideband (UWB) wireless technology. Proposed separately by **Metrom Rail** and transportation engineer **Robert James**, this next-generation technology eliminates the need to acquire and install expensive, cumbersome equipment required by Computer Based Train Control (CBTC) signal technology. A UWB-based network has the potential to provide precise and accurate locations for subway cars within centimeters. UWB sensors can also be placed in work trains and even on personnel, to add an additional level of safety for track workers and contractors working near passenger trains.
The MTA is continuing proof-of-concept tests with UWB technology, and plans to work with industry suppliers of CBTC technology in exploring UWB's potential in signaling. The MTA will look to incorporate UWB, as well as various new signaling technology, in future procurements for signaling projects, to modernize the system at a greatly expedited schedule and lower cost than current estimates.
- Winner 2: Onboard sensors and cameras for train positioning, submitted separately by **Ansaldo STS** and **Thales Group**. This technology, similar to those used in autonomous vehicles, would be placed on trains with little to no equipment near tracks. Existing train location technology depends on complex wayside equipment that is time-consuming and costly to deploy and maintain. The winners each proposed innovative onboard systems that would efficiently and accurately perform necessary train position actions while maintaining safety, reducing delays and mitigating costs.
The MTA plans to develop specs for a sensor-based system supplementary to CBTC signal technology. This process is contingent upon the current market for sensor-based technologies and next-generation technologies that are in development industry-wide, and is expected to take up to five years from development to implementation. Such a solution can eliminate the need for expensive and unwieldy wayside equipment, eliminate delays associated with existing, aging wayside equipment, and negate the need for costly upkeep and repairs that require service diversions.

Challenge 2: Subway Cars

Challenge 2 sought strategies to obtain and deploy modern subway cars more efficiently or refurbish existing cars in order to increase the subway system's capacity and reliability, prevent car breakdowns, and reduce delays. The panel chose three winners, each of whom will receive a $330,000 award.

- Winner 1: Modify passenger loading with longer trains to increase capacity, submitted by transit enthusiast **Craig Avedisian**. Avedisian proposed changing passenger loading procedures and adding more cars to trains to increase capacity.
The MTA will evaluate the system's busiest subway lines, stations where platforms are long enough to accommodate longer trains, and fleet and yard availability, to further explore applications of Avedisian's idea. Some subway lines are viable candidates for a pilot program due to ridership demand and their station layouts. A study of fleet and infrastructure availability will be needed for a future pilot program or future car procurement.
- Winner 2: **CRRC**, the largest train car producer in the world, proposed to invest $50 million of their own money initially to develop a new subway car for MTA NYC Transit that will explore new, lighter materials such as carbon fiber; modular design to permit quicker installation of system parts; and modern train control technology to reduce maintenance time and make upgrades easier. These trains could include customer benefits such as Wi-Fi, charging ports, LED lighting and screens for real-time customer information.
The MTA will immediately begin meetings with CRRC to develop this car, which represents a new approach to car design and manufacturing for the MTA. CRRC assumes all risks and costs for this investment, and the research and development from this investment can be used for future open and competitive procurements for new car purchases.
- Winner 3: **CSinTrans**, an international provider of technology solutions for transit, proposed a software platform that takes the existing diagnostic data for all operating systems within subway cars and transmits the information to MTA maintenance crews quickly and efficiently. Currently this diagnostic data for each subway car is sent to the car's manufacturer but not shared with the MTA. CSinTrans proposed capturing this data and delivering it in a dashboard to MTA maintenance crews, alerting them immediately, for example, when a subway car's heating or cooling system has failed. This near-real time delivery of maintenance information will expedite response times, identify problematic systems and prevent breakdowns during service.
The MTA is meeting with manufacturers of the existing car fleet to obtain the diagnostic data, and plans to deploy similar diagnostic systems as soon as possible once the data is available. These systems also will be incorporated into future car procurements.

Challenge 3: Communications

Challenge 3 sought to identify communications systems that will support the rapid installation and deployment of modern train communications and control technologies in the subway system, to increase the system's capacity and overall through-put. Judges selected one winning idea, and one idea worthy of an honorable mention that was submitted separately by two firms. The winner will receive a $500,000 award. Honorable mentions do not receive a monetary award.

- Winner: The Big B is a robotic installation system proposed by **Bechtel Innovation**, which is a part of the largest construction and civil engineering firm in the United States. The Big B is a semi-automatic robotic system that would rapidly install communications and control infrastructure in track tunnels. This robotic system can climb on tracks, into stations, onto platforms or service bays, and install hardware and other preparatory infrastructure needed for communications equipment installation or repair. This technology would free up crews to perform more complex tasks for more efficient use of manpower, as well as decrease the length of service diversions needed to give track access for crews. Similar robotic systems have been deployed and used in large-scale projects in European transit systems.
The MTA will identify time-consuming and repetitive work associated with communications equipment installation that a similar robotic system could perform, and use those design specs for a future procurement. Such a system could be designed, programmed, built and implemented in two years. Bechtel Innovation plans to reinvest its $500,000 cash award in an internal development group that will work exclusively with the MTA to design a similar robotic system.
- Honorable Mention: A long-term evolution (LTE) network that would provide ground connectivity for trains in track tunnels, allowing continuous communications for train operators between stations and expanding cellular service or Wi-Fi connectivity to customers between stations, submitted separately by **Transit Wireless** and **Alcatel-Lucent**.
The MTA will include this LTE approach in its overall communications and information technology plan, with plans for a future procurement.

Rick Carlson, Chief Operating Officer, Metrom Rail, signals challenge co-winner: "We're gratified that the MTA recognized Metrom Rail's vision for the future of transit. We are pursuing a radical departure from traditional train control systems by providing a cost-effective solution that helps transit

agencies minimize delays and accommodate more riders. We are excited to propel the use of ultra-wide band technology in the transit industry and look forward to working with the MTA – and other agencies worldwide – to dramatically improve transit operations."

Robert James, signals challenge co-winner: "Using ultra-wideband provides total situational awareness in the tunnels. We can double the train capacity provide greater safety to the trains and the track workers."

Andy Barr, Chief Executive Officer and General Manager, Ansaldo STS, signals challenge co-winner: "Ansaldo STS is extremely proud of this award. It represents the best recognition of our continued commitment to modernize New York City's subway signal system. In our company, we consider the U.S. a domestic and strategic market. Such achievements reinforce our dedication to design and develop new products which fit the need of our local customers. Improving the quality of life is our mission, making it possible is our daily task."

Dominique Gaiardo, Management Director Urban Rail Signaling, Thales Group, signals challenge co-winner: "Governor Cuomo's and MTA's Genius Transit Challenge is an important step towards more efficient and more reliable transit services in New York City. As a company passionate about innovation, Thales is here to help the Governor and MTA master the signaling complexities they face for the most citizen-demanding metro in North America – whatever it takes."

Craig Avedisian, subways cars challenge co-winner: "Adding more subway cars to trains to expand capacity costs a lot less, and can be implemented far more quickly, than building new stations and tunnels. The idea provides enormous flexibility to deliver capacity where it is needed, and even leaves room for future growth. I am thrilled that the MTA also saw these benefits and is willing to apply the idea to get real results for customers. The real winners here are New Yorkers."

Jia Bo, Vice President, CRRC MA, subways cars challenge co-winner: "We are honored and excited to have been chosen for the MTA's Genius Transit Challenge. We look forward to introducing CRRC's design philosophy focused on accelerating the pace subway vehicles are procured and deployed to the New York transit system."

Marshall Moreyne, Chief Executive Officer, CSinTrans, subways cars challenge co-winner: "CSINTRANS (CSiT) is honored to have been selected as having one of the best ideas for this challenge. Implementing a multi-modal transit information system such as TRANSIS will contribute to improve the reliability of rail cars as well as help reduce future capital and maintenance costs of rail car equipment at the MTA. At the same time, customer information to the passenger will be greatly improved by providing the MTA the means to communicate relevant and timely information to travelers with a world-class customer communication network. We thank the MTA for taking such a bold and novel approach to finding the best innovative solutions worldwide."

Peter Toth, innovation engineer, Bechtel Innovation, communications challenge winner: "Collaboration between the public and private sectors is essential for solving today's complex infrastructure problems. We are excited to be involved with this grand challenge and look forward to contributing to a viable solution alongside the MTA."

The judges for the MTA Genius Transit Challenge were:
Sarah Feinberg, former administrator, Federal Railroad Administration
Daniel Huttenlocher, Dean and Vice Provost, Cornell Tech
Charles Phillips, CEO, Infor; former co-president and director, Oracle
Kristina Johnson, Chancellor-elect, State University of New York
Nick Grossman, General Manager, Union Square Ventures
Eliot Horowitz, co-founder and Chief Technology Officer, MongoDB
Balaji Prabhakar, professor of electrical engineering and computer science, Stanford University
Joe Lhota, Chairman, MTAPat Foye, President, MTA
Veronique "Ronnie" Hakim, Managing Director, MTA
Janno Lieber, Chief Development Officer, MTA

The members of the newly launched Transit Innovation Partnership (TIP) are:
Chairman: Alan Fishman, Chairman, Ladder Capital Finance LLC
Kenneth Bronfin, Senior Managing Director and Head of International Investments, Hearst Ventures
Kevin Chavers, Managing Director, BlackRock
Maria Gotsch, President and CEO, Partnership Fund for New York City
Carol Kellermann, President, Citizens Budget Commission
Linda Kirkpatrick, Executive Vice President, U.S. Market Development, Mastercard
David Levin, Former CEO, McGraw Hill Education
Nancy Louden, Senior Vice President, Global Government Relations, The Estée Lauder Companies Inc.
Bill Mulrow, Senior Managing Director, Blackstone
Charles Phillips, Chief Executive Officer, Infor
Steven Rubenstein, President, Rubenstein Communications Inc.
William C. Rudin, Co-Chairman and CEO, Rudin Management Company Inc.
Scott Salmirs, President and Chief Executive Officer, ABM Industries Inc.
Edward Skyler, Executive Vice President, Global Public Affairs, Citigroup Inc.
Tom Wright, President, Regional Plan Association
Kathryn Wylde, President and CEO, Partnership for New York City