Submission to the United States Department of Transportation
by the New York City Department of Transportation

For:

Designation of New York City as an Automated Vehicle Proving Ground

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"New York City must be prepared to embrace the future that is all but imminent. We cannot and will not be a city that stifles innovation, nor suppresses market demand. However, we will search for a balance that places the public good at the forefront of our work and therefore think carefully about how autonomous vehicles interact with our city and its millions of people." Ydanis Rodriguez, New York City Council Member, Chair of Transportation Committee, Driverless Car Oversight Hearing 10/28/16

A. Introduction

The New York City Department of Transportation (NYC DOT) recognizes that automated vehicles (AVs) will be part of our future transportation mix, and could come to dominate surface transportation in a matter of decades. If properly designed and implemented, AVs promise dramatic improvements in street safety, an opportunity to reduce private car ownership and increase shared-use mobility, and the potential to accelerate vehicle electrification and realize air quality and carbon reduction benefits.

However, in order to realize these benefits in cities like New York, the software and equipment guiding AVs require careful testing in a range of complex and chaotic urban street environments. New York City believes that to most effectively navigate the City's system of surface streets, arterials and highways, AVs will need to connect to each other and to infrastructure—a perspective supported by USDOT's announcement of a proposed rulemaking requiring all new light-duty vehicles to be able to use Dedicated Shortrange Radio Communication to transmit Basic Safety Messages. NYC DOT is already partnering with USDOT on a Connected Vehicle (CV) Pilot, making the City uniquely poised to support evaluation of the convergence of CV and AV technologies.

New York City is initiating an Automated Vehicle Testing Program to facilitate the testing of AVs that promote accessible, shared, electric mobility, and the convergence of connected and automated vehicle technologies. New York City is applying for the designation of AV Proving Ground in order to provide AV developers with an unmatched opportunity to develop their vehicles and technologies and contribute to a set of best practices for AV operations in busy urban centers across the country.

Applicant Information

NYC DOT has over 4,500 employees, and oversees the largest and most complex urban street network in North America, with over 6,000 miles of streets and sidewalks, 789 bridges, 95 miles of bus lanes, and more than 1,000 miles of bike routes. The agency controls 13,000 signalized intersections from its Traffic Management Center (TMC) utilizing the NYC citywide wireless system (NYCWiN), and maintains over 310,000 streetlights and one million signs. It also operates the Staten Island Ferry, the second largest public ferry service in the United States. Each day this integrated system supports the movement of millions of people by foot, bus, bike, ferry, and car, and enables trucks to deliver millions of tons of freight to homes and businesses. NYC DOT's work is guided by its *Strategic Plan 2016*, and the City's *One New York: The Plan for a Strong and Just City,* which both compel it to seek innovative solutions to respond to the dramatic growth of the City, and the mobility, sustainability and equity challenges it faces.

The Testing Program will be overseen by NYC DOT's Traffic Operations (TO) unit, and supported by the Policy unit. TO manages the TMC and oversees the CV Pilot, and has broad expertise in traffic engineering and transportation systems management.

In addition, TO can call on the staff resources of other units within the agency, such as External Affairs and Transportation Planning & Management (TP&M), including TP&M's Transit Development Group. TO and TP&M also have access to multiple teams of federally procured on-call consultants from planning and engineering firms, and have the capability to assemble and release requests for proposals for planning and engineering services.

B. NYC DOT Connected Vehicle Pilot

The decision to initiate an AV Testing Program in New York City builds on USDOT and the City's combined $26 million investment in connected vehicle equipment and infrastructure. While AV and CV technologies are both progressing through various development and testing efforts, NYC DOT is not aware of any other testing of both technologies in an urban transportation environment. NYC DOT intends to leverage this substantial investment of resources into CV infrastructure to advance the integrative testing of CV and AV technologies, and identify best practices to inform municipalities around the country and original equipment manufacturers globally.

In 2015, USDOT awarded the New York City Department of Transportation $21.6 million, supplemented by $4.8 million in City contributions, to spearhead the largest deployment of connected vehicle technology to date. NYC DOT's planned deployment provides an ideal opportunity to evaluate connected vehicle technology and applications in tightly-spaced intersections typical in a dense urban transportation system. The project area encompasses three distinct and relatively high-complexity areas in the boroughs of Manhattan and Brooklyn. The first area includes a 4-mile segment of Franklin D. Roosevelt (FDR) Drive in the Upper East Side and East Harlem neighborhoods of Manhattan (red in Figure 1). The second area includes four one-way corridors in Manhattan (green in Figure 1). The third area covers a 1.6-mile segment of Flatbush Avenue in Brooklyn (Green in Figure 2).

Up to 5,800 cabs, 1,250 MTA buses, 400 commercial fleet delivery trucks, and 500 City vehicles that frequent these areas will be outfitted with the CV technology. Using Dedicated Short Range Communication (DSRC), the deployment will include approximately 310 signalized intersections for vehicle-to-infrastructure (V2I) technology. In addition, NYC DOT will deploy approximately 8 roadside units (RSUs) along the higher-speed FDR Drive to address challenges such as short-radius curves, a weight limit and a minimum bridge clearance and 36 RSUs at other strategic locations throughout the City to support system management functions. As a city bustling with pedestrians, the pilot will also focus on reducing vehicle-pedestrian conflicts through in-vehicle pedestrian warnings and an additional V2I/I2V project component that will equip approximately 100 pedestrians with personal devices that assist them in safely crossing the street.

In 2016, NYC DOT completed Phase I, a twelve-month Concept Development process. This phase included selection of the connected vehicle applications of interest, completion of the Safety Management Plan, and a week-long demonstration of connected vehicle technologies by interested vendors at the Aqueduct Racetrack in Queens. The Agency is now in Phase II: Design, Deployment and Test, which will continue through mid-2018. Procurement of the CV equipment is currently underway, with a product demonstration in December of 2016 and deployment planned for early 2017.

Figure 1: Connected Vehicle Pilot Area Connected Infrastructure Deployment - Manhattan

Figure 2: Connected Vehicle Pilot Area Connected Infrastructure Deployment - Brooklyn

C. NYC DOT Automated Vehicle Testing Program

As the next step to accelerate the safe testing and deployment of connected and automated vehicle technology, the NYC DOT is initiating a three-year, multi-track AV Testing Program within the five boroughs. The program will focus on four main goals:

1. Testing AV technologies in a full spectrum of real urban environments among diverse populations;
2. Advancing the convergence of AV and CV technology;
3. Exploring opportunities and design solutions to ensure AVs are accessible to New Yorkers of all ability levels; and
4. Encouraging electric, shared last-mile mobility solutions that supplement transit.

Through this program, NYC DOT intends to advance efforts to develop AVs and mobility service models that achieve these goals. The agency will simultaneously pursue two separate testing structures, or tracks: (1) fixed route automated shuttles and (2) automated passenger vehicles. This dual testing program will allow NYC DOT to explore multiple functions and use cases concurrently, and the relationship of the two models in the context to the City's broader transportation system and mobility needs.

Both tracks will follow a tiered-complexity model, where AV systems will begin by testing in low-traffic environments, and, as they demonstrate greater capability based on NYC DOT's safety evaluation, progress to more complex environments. For the purposes of this program, complexity refers to all of the factors that affect the difficulty of navigating an environment for AVs, including traffic volumes and speeds, pedestrian and cyclist volumes, curb regulations and compliance, consistency and visibility of lane markings, street geometry, construction activities and other planned obstructions, weather and the impact of tall buildings on AV sensors. This approach will ensure that the full breadth of New York City's street environments can be brought to bear on the program in a safe and responsible manner.

Vehicles in both tracks will be equipped with the CV technologies, adapted to operate in an AV system to the degree feasible without disrupting the Connected Vehicle Pilot timeline. Because the current CV Pilot areas represent some of the highest-use streets in the City, connected infrastructure will also be installed at one or more of the low-complexity test environments, to begin testing the applications of CV technology in AV systems at the initial stages of the program.

Track I – Fixed-Route Automated Shuttles

NYC DOT will initiate the AV Testing Program by soliciting interest in testing connected, automated shuttles, capable of transporting 8-15 passengers at a time, on fixed routes with pre-determined stops. These shuttles will be deployed at first to limited-access, low-complexity campus environments, and all automated shuttles will have backup operators onboard, both to ensure safe operation and to comply with current Federal and New York State AV legal requirements. Using metrics that the project team develops in consultation with industry and other transportation professionals operating AV testing programs, NYC DOT will evaluate the performance of the vehicles in the low-complexity environments. If the team determines that the system has met the pre-set performance targets, NYC DOT will initiate testing on a

more complex route. All services will be free to passengers for the duration of the three-year testing period.

The test vehicles will be outfitted with connected vehicle equipment capable of communicating with the other vehicles in the CV Pilot, and the connected roadside infrastructure being tested in the CV Pilot areas. Shuttles tested in Track I will also be required to be accessible to New Yorkers with disabilities and NYC DOT will encourage participants to use electric or hybrid-electric vehicles.

Figure 3: EasyMile's EZ10, an example of the low-speed automated shuttles that Track I will test in environments of tiered complexity (Wikimedia Creative Commons)

Track I seeks to build on the European Union's CityMobil2 demonstration efforts, conducted throughout Europe between 2014 and 2016 in a range of environments, from limited-access campuses to moderate-density urban centers, such as La Rochelle, France, and Trikala, Greece. In these tests, the low-speed shuttles carried passengers to transit stops, between tourist attractions, and around campus facilities, typically at speeds considerably lower than their maximum of 25 miles per hour (mph).

Similar to other emerging automated shuttle test projects in the US, such as the one being initiated by the Contra Costa Transportation Authority in California, Track I aims to contribute to the developing body of best practices for testing and deployment of higher-occupancy AVs, with a particular focus on urban centers and inclement weather scenarios. These tests will explore not only the operational capabilities of automated shuttles in a variety of environments, but also their functional potential as connections to transit, especially for users with disabilities or limited mobility.

As transit vehicles, these shuttles may be considered for connected-vehicle transit service solutions such as Transit Signal Priority (TSP), in addition to the other safety applications being testing in the CV Pilot (See Figure 4). Looking ahead, linking automated shuttles to the CV pilot may lay the foundation for future investigation into coordination between different transit modes through CV systems. Such real-

time communication could improve transfers between modes (between automated shuttles and Select Bus Service buses, for example), and better encourage multi-modal trips.

Starting with fixed routes in limited-access, low-complexity locations, the Track I test routes will increase in complexity as the AV systems demonstrate greater competencies. Most of the test locations will not include separated lanes for the shuttle to travel in, meaning it will be required to respond to the mix of street users in each environment. While the locations are still being finalized and this framework may be modified, NYC DOT has identified the following tiers of complexity for Track I:

Tier 1: Low-complexity, limited-access campus
The shuttle will operate within a campus environment with extremely limited, low-speed vehicle traffic. The shuttle will provide transportation services on a fixed route around the facilities. Lanes will be clearly marked, and operating speeds will generally be kept below 10 mph. Potential locations include the Brooklyn Navy Yard, a 300-acre industrial park in Brooklyn operated by the New York City Economic Development Corporation (NYC EDC), and Governors Island, a park and cultural complex in New York Harbor operated by the Trust for Governors Island.

Tier 2: Low-complexity street environment
The shuttle will operate on a fixed route in a low-traffic street environment with other vehicles. It will provide transportation services from partner facilities or housing developments to transit or ferry stops, between nearby campus locations, or along low-complexity street corridors. NYC DOT will select corridors that demonstrate high levels of compliance with curb regulations and low traffic and delivery volumes. Lanes will be clearly marked, and operating speeds will generally be kept below 15 mph. Potential locations include Roosevelt Island, a residential and research community in the East River, Co-op City, an 600-acre housing development in the Bronx, and the Brooklyn Army Terminal, an industrial park operated by NYC EDC.

Tier 3: Medium-complexity street environment
The shuttle will operate on a fixed route in a medium-traffic street environment. It will provide transportation services along neighborhood commercial corridors, from partner facilities or housing developments to transit or ferry stops, or between nearby campus locations. Routes may be longer than in Tier 2, and may involve moving through busier intersections. Lanes will generally be clearly marked, but some markings may be faded. Operating speeds will generally be kept below 20 mph. Potential locations include neighborhood commercial corridors in the Bronx, Brooklyn, Queens and Staten Island. These locations will be identified during the planning for the testing program in 2017.

Tier 4: High-complexity street environment
The shuttle will operate on a fixed route in a high-traffic street environment. It will provide transportation services along regional commercial corridors, in addition to the route types identified in the lower tiers. In Tier 4, lanes may not be well delineated, and may occasionally be obstructed by double-parked vehicles, requiring the capacity to safely change lanes. Operating speeds may reach a maximum of 25 mph, but will likely be kept lower in accordance with other vehicle traffic. Potential locations include the Financial District in Lower Manhattan and Downtown Jamaica in Queens.

Tier 5: Very high-complexity street environment
The shuttle will operate on a fixed route in a very complex street environment. Lanes may not be well delineated and may often be obstructed by double-parked vehicles, requiring the capacity to safely change lanes. These environments will include the high pedestrian and cyclist volumes characteristic of the City's Central Business Districts. NYC DOT does not expect to initiate testing at this level for several years. Potential locations include: Midtown Manhattan, Downtown Brooklyn, and Downtown Flushing in Queens.

Particularly for the tiers that occur on public streets (2-5), NYC DOT will encourage the test entity to integrate a fleet management system into the test effort, where the shuttles are monitored remotely to evaluate challenges encountered in real time and determine how to proceed. In the CityMobil2 pilots, this management component improved the performance of the vehicles and the experience of the passengers by enabling a greater degree of flexibility as the systems engaged with unforeseen obstacles common to public streets.

Though we have identified five tiers of complexity that could categorize any street environment in the City, NYC DOT does not expect to begin testing in Tiers 4 and 5 within the initial three years of the program. NYC DOT expects testing entities to require several years of successful demonstration in the first three tiers to demonstrate sufficient system capability to begin exploring testing in tiers 4 and 5. After the completion of three years of Track I, NYC DOT will evaluate whether it is in the City's best interest to continue testing and/or operating automated shuttles.

Track II – Standard Automated Vehicles

Track II, which will start after but run concurrently with Track I, will collaboratively build a test program for electric, connected and automated vehicles with interested industry partners through a Request For Expressions of Interest (RFEI) to test within the City. Whereas Track I focuses on automated shuttles, during Track II NYC DOT will facilitate the testing of AV systems operating in vehicles that conform to more standard passenger vehicle models.

This, too, will follow a testing sequence based on tiered complexity. However, instead of operating on fixed routes, vehicles in Track II will be permitted to operate autonomously within zones that correspond to Tiers 1-5 in Track I. In addition to testing the automated system in a closed campus environment, Tier 1 will also include driving the vehicles in manual mode in Tier 2 and Tier 3 environments, to determine how the system would respond were it operating in automated mode. Once NYC DOT determines that a given AV test system has met its pre-established performance benchmarks within a specified operational design domain (ODD), it will advance to the next, more demanding tier, with the final level permitting the vehicle to test autonomous operation across the entire City. NYC DOT will identify the Track 2 testing locations during the planning phase of the program in 2017.

Figure 4: nuTonomy's automated passenger vehicle, currently being tested in Singapore. (nuTonomy)

As in Track I, NYC DOT will endeavor to structure Track II testing to provide real transportation services to New Yorkers, while ensuring that the systems being tested have passed a rigorous safety analysis by operating safely without passengers in the test environment for several months. Professional test drivers will be required in all test vehicles.

During the three-year AV Program, NYC DOT will evaluate the performance of Track II participants in the different difficulty tiers. This testing will advance AV systems by providing access to a dense urban testing environment setting for the software to mature, as well as generate important new information about the unique challenges posed by such transportation environments. The RFEI will also focus on secure data sharing methods that respect privacy but provide the City critical trip information that can be used to better actively manage the street network. These methods will be developed in consultation with other cities engaging in similar testing, and industry and security experts. Looking to USDOT's Federal Automated Vehicles Policy, NYC DOT will base its evaluation of the AV systems in part on how they address the document's 15-point Safety Assessment.

Additional Agency Long-Term Planning Efforts

In addition to the commencement of AV testing in the City, NYC DOT has begun a series of long-term planning activities to holistically assess the City's social, legal, financial, infrastructural readiness for automated vehicles. These efforts, including the development of an NYC DOT Automated Vehicle Policy Framework and ongoing stakeholder engagement, involve collaboration across agencies and different levels of government, and will determine how the City can shape the advent of AV technology, particularly within the five boroughs, to achieve our desired outcomes: improved safety, mobility, equity and sustainability. NYC DOT has identified the following actions, and will pursue them in tandem with the AV Testing Program.

- Expand the existing NYC Automated Vehicle Working Group to include all relevant municipal agencies;
- Develop and publish a NYC Automated Vehicle Policy Framework (AV Framework) laying out considerations, current readiness, desired outcomes and potential actions for New York City to take in relation to AVs;
- Collaborate with manufacturers advancing AV technologies to identify and categorize the different operational design domains (ODDs) within the City to determine how vehicles may be safely used in and, if necessary, restricted from certain areas;
- Work with partner agencies and entities to develop comprehensive fiscal, financial, and business tools as a basis for investment decisions related to vehicle automation in the City;
- Create methods to include AV technology scenarios in policies and planning of transportation infrastructure; consider changes in current assumptions, investments, processes, and decisions;
- Engage with stakeholders, including communities, elected officials, civic groups and industry partners to promote informed discussion, building on the testimony presented at the NYC Council Oversight Hearing on Driverless Vehicles;
- Engage with other US cities, through the AV Proving Grounds Community of Practice, the National Association of City Transportation Officials, and other networks to share best practices, identify common goals and coordinate data sharing standards; and
- Advocate at State and Federal level to advance regulatory and policy actions that promote desired outcomes as identified in the AV Framework.

Program Implementation Timeline

The following timeline illustrates NYC DOT's intended course of action to implement the AV Testing Program:

Finalize Test Routes and Neighborhoods: Q1-Q2 2017

- Finalize list of viable locations for Tracks I and II
- Engage with elected officials to determine most interested neighborhoods
- Develop engagement materials and seek input from relevant stakeholders

Solicit Interest in Testing: Q2-Q4 2017

- Issue Track I RFP for selected routes
- Issue Track II RFEI for selected neighborhoods
- Select Track I test entities to begin at initial sites
- Develop Track II test program based on responses to RFEI

Finalize Safety Management Plan and Evaluation Metrics: Q4 2017

- Release comprehensive Safety Management Plan for Tracks I and II
- Appoint Designated Safety Officer
- Confirm evaluation measures to be employed in both Tracks of the testing program in comparison with other AV testing best practices and lessons from the CV pilot

- Provide CV Infrastructure for Tier 1 and 2 AV Proving Ground Environments: Q3 2017-Q4 2018
- Plan and engineer CV infrastructure elements in low complexity campus/street environments
- Install basic CV infrastructure elements for low complexity campus/street environments

Facilitate AV Testing and Operation: 2018-2020

- Coordinate necessary route and neighborhood high-definition mapping for AV system with program participants
- Begin initial Track I testing at campus location by 1/1/18
- Begin Track II testing at campus location and manual operation in Tier 2 and 3 locations
- Perform reviews of Track I and II participants' AV system performance at periodic intervals, and evaluate potential to progress to more complex tiers
- Reissue RFP for participation in both Tracks on a yearly basis to engage more parties interested in safe testing within the City

Review Testing Program Effectiveness and Evaluate Continuation: Q1-Q4 2020

- Evaluate progress made by automated vehicle systems through program tiers
- Measure mobility services provided during program, particularly through Track I
- Determine economic impact of testing on the City
- Reassess City priorities in automated vehicle space based on program findings and impacts
- Decide whether to continue testing program in New York City

D. Designation as an Automated Vehicle Proving Ground

In light of these forthcoming AV testing efforts and the unique opportunities presented by the City's significant investment in connected vehicle infrastructure, NYC DOT is applying to join the Community of Practice to advance the research and testing of these new technologies as an Automated Vehicle Proving Ground under the city/urban core category. NYC DOT expects participation in the Community of Practice to amplify the impacts of its local testing efforts and to accelerate the development of this potentially revolutionary technology.

Response to Evaluation Criteria

Mandatory Criteria

New York City commits to appointing a Designated Safety Officer to oversee the program and participate in the Community of Practice, and sharing the Safety Management Plan once it is completed, before the commencement of testing in 2018. Non-proprietary safety data, anonymized to protect passengers' privacy where applicable, will be made available to members of the Community of Practice.

Proposed Contributions

Now entering its second year and Phase II of the program, NYC DOT's CV Pilot has produced a comprehensive Safety Management Plan, following the methodology outlined in ISO 26262. This publicly-available plan demonstrates NYC DOT's commitment to safety and capacity to develop a robust

safety management tool. Over the course of the next year, NYC DOT will adapt this plan methodology to prepare a Safety Management Plan for the AV Testing Program, which will be made accessible to all participants in the Community of Practice and the general public.

New York City has a long history of providing leadership in transportation and infrastructure, which continues with the CV Pilot and the proposed AV Testing Program. And, because of its size and international profile, any test of these technologies in the City will be closely watched by regulators and industry actors across the country. The intensity of New York City's densest neighborhoods has led it to be referred to as the "double-black diamond" of AV testing grounds.

While testing will proceed cautiously through less-complex environments before reaching that level, the need to expose these technologies to the country's most complex surface transportation network is paramount. The lessons learned in New York regarding pedestrian interactions, responses to inclement weather and frequent construction impacts, and performance in dense built environments will provide a wealth of information useful to all major urban areas and participants in the Community of Practice; simultaneously, the focus on transit connections and shared mobility will encourage more focus on both automated transit solutions and system integration.

An emphasis on wheelchair accessibility and the specific needs of New Yorkers with disabilities will also advance the national conversation around the expansion of mobility services for vulnerable populations. And, given New York City's large population of professional drivers, the City will use this increased visibility to begin planning, studying, and advocating for solutions to help mitigate the labor market impacts that self-driving vehicles are likely to cause. Millions of Americans make their living by driving and the engagement and workforce methods developed here will be relevant elsewhere.

Outside of the Community of Practice, New York City will leverage its connections to other groups of transportation professionals, such as the National Association of City Transportation Officials (NACTO), Transportation Research Board (TRB), and ITS America, to spread its findings and the lessons learned from the Community of Practice to other interested municipalities.

Commitment to Safety

New York City Mayor Bill de Blasio was the first mayor of a major American city to adopt Vision Zero, and the City has made a steadfast commitment to street safety central to every aspect of its operations. The results are compelling: 2015 saw fewer traffic deaths than in any year since 1910, even as deaths increased nationally. As part of Vision Zero, the City reduced its speed limit to 25 miles per hour. Our low speed environment will be conducive to the safe testing of AVs: Like all human drivers, AVs will be required to comply with the speed limit at all times, increasing the time available for detecting and responding to other street users and unknown obstacles, and decreasing the time necessary to slow or stop when necessary.

As with the CV Pilot, the AV Testing Program will be structured around conservative operational best practices. Testing in the City will begin under a comprehensive Safety Management Plan developed in 2017. In all cases for both tracks of the program, professional test operators will be present in the vehicle and ready to retake control instantaneously should the vehicle show signs of misinterpretation or

malfunction, and NYC DOT will explore the potential to implement driver attentiveness monitoring. Further, the tiered structure of the program is designed to conservatively assess and permit automated vehicle operation in an expanding number of environments, so that the test procedure for AV technology is consistent with the standard of safety demanded in all other facets of DOT's work. We commit to coordinating with other members of the Community of Practice around Safety Management Plan best practices in order to further enhance the safety of the program.

Research, Application and Data Sharing

Though it is perhaps best known for the uniquely-dense streets of Midtown Manhattan, New York City in fact comprises an extremely diverse set of neighborhood and street typologies, ranging from quiet residential streets with single-family homes and parked vehicles to bustling avenues lined by skyscrapers and overflowing with pedestrians, cyclists, buses, cabs and street vendors. This typological spectrum presents an opportunity to test automated vehicles in a relatively comprehensive set of circumstances, producing information exportable to other municipalities across the country.

The City's emphasis on robust data gathering and analytical methods will ensure that its AV testing efforts are well-documented and the findings complement the other efforts within the Community of Practice. NYC DOT and the New York City Taxi and Limousine Commission (NYC TLC) already collect, analyze, and share a range of anonymized traffic data, including aggregated GPS data for all yellow, green and livery cab trips in New York City. As with this data, NYC DOT will collect, analyze and share results from the program with Community of Practice, while ensuring that the methodology protects passengers' privacy and participants' proprietary information.

The extensive concept development and related stakeholder engagement completed for the CV Pilot provides a strong basis for the AV Testing Program's data recording and sharing protocols. Though the potential privacy concerns for the CV Pilot, which installs sensors directly into thousands of stakeholders' vehicles, are significantly greater than in the AV program, the use of largely similar protocols, including the encryption and anonymization of data, will support integration of the efforts and the use of consistent best practices.

While NYC DOT will collaboratively develop the metrics to be reported during participation in the AV Testing Program, many of those used in the CV pilot to measure the effectiveness of the safety applications are also of interest for the AV program. Both tracks of the AV testing will aim to collect high-level information on the vehicle's performance within the test environment, including precision of the sensors equipment and analysis of the roadway conditions; aspects of the street environment that are consistently challenging to AV systems; instances of sudden unexpected; instances of sudden deceleration and perceived "near misses"; any contact with other vehicles or pedestrians; and total miles traveled. Track I vehicles will also measure the number of passengers they transport, and passengers will be periodically surveyed about their responses to the vehicles. The project management team will use the Vehicle Performance Guidance in USDOT's recently-released Federal Automated Vehicles Policy to assess and report on the vehicles' Object and Event Detection and Recognition (OEDR) capabilities throughout the program. Where feasible, NYC DOT and the test partners will explore the use of the CV

infrastructure installed in the CV Pilot areas to automatically relay information relevant to the AV program, as occurs in the CV Pilot, potentially decreasing the reporting burden on the test entities.

New York City is home to a group of research institutes and universities with a demonstrated interest in automated vehicles. The City will engage with these institutions through a Request for Qualifications seeking academic partners interested in leveraging their research and analytics capacities to extend the impact of the AV Testing Program. In just the last several months, NYC DOT participated in a panel on self-driving vehicles featuring a subject-matter expert from the New York University (NYU) Rudin Center for Transportation; organized a panel titled "Automated Vehicles: Principles for Testing in Urban Centers" as part of 5th Annual Automated and Connected Vehicle Symposium, hosted by the City College of New York's University Transportation Research Center and the NYU Tandon School of Engineering; and participated in a panel on automated vehicles at the annual meeting of the National Association of City Transportation Officials (NACTO). EDC oversaw a Cornell University graduate planning studio's investigation of the viability of an automated shuttle operating on Governors Island. Civic organizations, such as the Municipal Arts Society, TechNYC and the Urban Design Forum, have also expressed interest in partnering with the City to explore the impact of automated vehicles on the function and form of our future metropolis.

With the publication of USDOT's Federal Automated Vehicles Policy, state-level conversations about how to properly respond to and encourage these technologies have begun. The NYC DOT AV Testing Program will prove invaluable in guiding state-level conversations about long-term regulatory action around testing and deployment of automated vehicles by providing a wealth of real-world feedback in a diverse range of contexts.

Demonstrated Investments

The Automated Vehicle Testing Program will build on the considerable investment of Federal and City resources in the Connected Vehicle Pilot, a $26 million program to develop the largest deployment of CV technology to date. The convergence of automated and connected vehicle technologies holds great promise to augment the safety and efficiency benefits of each system, but at present there has been little detailed, scientific exploration of the practical opportunities to combine them. Recognizing the significance of the investment in connected vehicle infrastructure as a backbone for safer and more effective transportation management practices, we will structure its AV Testing Program to probe the specific interactions of connected and automated vehicle systems, and generate best practices for other cities.

In addition to the CV Pilot, the City's Traffic Management Center (TMC), which controls over 12,000 signalized intersections equipped with Advanced Traffic Signal Controllers, represents a significant investment in innovative transportation management and offers a command point and relevant professional staff for overseeing the NYC DOT AV Testing Program.

Readiness

Adapting principles and best practices from the development of the Connected Vehicle Pilot, NYC DOT will move quickly to establish the Safety Management Plan and solicit interest in Track I testing of

shared, automated shuttles on fixed routes in limited access transportation facilities. Shortly thereafter, the City will solicit input from industry to develop a collaborative testing program for shared on-demand AVs. Initial locations for one or both of these tracks will be active before January 1, 2018, and subsequent test areas will be approved and opened thereafter.

During 2017, the City will finalize evaluation procedures of the AV program, drawing on expertise gathered during the planning of the CV Pilot and collaborating with industry stakeholders. For reference, Figure 5 shows the different CV applications being developed, tested and analyzed in the CV Pilot.

Figure 5 – Connected Vehicle Pilot Applications

ID	Category	NYCDOT – CV Application
1	V2I/I2V Safety	Speed Compliance
2		Curve Speed Compliance
3		Speed Compliance/Work Zone
4		Red Light Violation Warning
5		Oversize Vehicle Compliance
6		Emergency Communications and Evacuation Information
7	V2V Safety	Forward Crash Warning (FCW)
8		Emergency Electronics Brake Lights (EEBL)
9		Blind Spot Warning (BSW)
10		Lane Change Warning/Assist (LCA)
11		Intersection Movement Assist (IMA)
12		Vehicle Turning Right in Front of Bus Warning
13	V2I/I2V Pedestrian	Pedestrian in Signalized Crosswalk
14		Mobile Accessible Pedestrian Signal System (PED-SIG)
15	Mobility	Intelligent Traffic Signal System (I-SIGCVDATA)

Opening New York City to AV testing may attract considerable interest from industry. Fortunately, the sheer size of and number of different viable locations within the City will provide ample opportunity for different parties to test within the five boroughs. Given that the two tracks of the AV Testing Program involve different vehicle and route typologies, they will respond differently to vendor interest. Track I, which will test shared, accessible, automated shuttles on fixed routes, will only permit one user for each site during a given year, in order to ensure that each test operator is also providing a useful transportation service. As market research has indicated that there are comparatively few companies producing vehicles of this type, we anticipate that only a small number of routes will be necessary to accommodate all interested parties.

Track II, however, will test passenger automated vehicles, and is likely to appeal to a larger body of potential participants. Track II will identify zones that fit the tiered complexity levels, allowing AV systems that demonstrate sufficiency in low-complexity zones to expand operation into higher-complexity zones. Because zones will likely be on the scale of neighborhoods, and will distribute across the City, it will be viable for multiple operators to provide shared on-demand automated service within the same zones.

NYC DOT will designate a Point of Contact for government, industry and communities for the AV Testing Program. In all cases, the City will engage with the communities in which automated vehicles are being tested, and ensure not only that there is community buy-in, but also that residents understand how the program works, and how the vehicles can provide supplemental transportation services. Because this program will try to locate automated vehicles in areas with high concentrations of New Yorkers with limited mobility, many of which will also be older, the City will develop a comprehensive communication strategy in multiple languages to explain the vehicles and how they can be used. While outreach will continue and expand throughout the program, the letters of support included in this application speak to the broad interest in hosting these tests in the City, and the understanding that New York stands to benefit from testing and deployment of AVs.

Adherence to Laws, Regulations and Federal Policy

The City will ensure that its AV testing adheres to all federal, state and local laws and regulations. Vehicles will be required to meet all Federal Motor Vehicle Safety Standards (FMVSS), unless they demonstrate that they have been granted an exemption by the National Highway Traffic Safety Administration to test an automated vehicle that does not fully comply with FMVSS. The New York City Law Department is currently undertaking a legal audit of the New York State Vehicle Traffic Law (VTL) and related state statutes to understand the universe of relevant statutes, and inform future legislative and regulatory priorities in this area.

Section 1226 of VTL currently states that at least one hand or prosthetic device must be positioned on the steering mechanism at all times. As long as this statute remains in effect, the AV program will require test drivers to keep their hands poised at the wheel. Fortunately, this also represents a test-driving best practice, as it allows drivers to retake control more quickly when necessary, and decreases the likelihood of inattention.

It is likely that at some point in the future, legislators will seek to amend Section 1226 and perhaps other statutes in order to permit the testing of automated vehicles with driver control equipment. Should this occur, the City will consider pursuing trials of such vehicles that can demonstrate that a test driver is not necessary for public safety; until that point, only vehicles with the required human control equipment will be eligible for testing in the City.

Much of the testing that will occur under the NYC AV Testing Program will eventually occur on public roads. While the metrics used for the Pilot are still under development, they will include observation of the test vehicles compliance with the 15-point safety assessment outlined in the Vehicle Performance Guidance of USDOT's Federal Automated Vehicles Policy.

Appendix:

Letters of Support

THE CITY OF NEW YORK
OFFICE OF THE MAYOR
NEW YORK, NY 10007

December 15, 2016

The Honorable Anthony R. Foxx
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, D.C. 20590-0001

Dear Secretary Foxx:

I am writing to request that the U.S. Department of Transportation designate New York City as a Community of Practice in the Automated Vehicle Proving Ground Pilot Program.

Shared, on-demand automated vehicles present one of the most compelling solutions to the mobility challenges that too many New Yorkers continue to face – especially our growing population of senior citizens and people with disabilities. However, in order to provide these accessibility improvements, vehicles must be affordable, accessible, and distributed equitably. Connecting New York with other test facilities and peer cities across the country will help ensure that this technology develops in a way that supports our diverse populations.

Participation in this pilot will also allow New York City to safely test automated vehicle technology on a complex traffic network, helping ensure that automated vehicles are able to operate on busy city streets. The City's traffic-safety initiative, Vision Zero, has made remarkable strides. In 2015, there were fewer traffic deaths on our streets than any year since 1910, even as the death toll increased nationally. New York City has built an ambitious Vision Zero program that combines policy, engineering and education, and we will use this framework to create a robust testing program that advances technology while serving communities.

We are grateful for USDOT's support for the NYC Department of Transportation's participation in the Connected Vehicles Pilot Program, and we are excited at the prospect of building on our connected vehicles work to examine the intersection of automated and connected technologies in urban environments. I ask that you once again affirm New York's unique opportunity to be a frontrunner in advanced transportation management.

Thank you for your support of this important initiative.

Sincerely,

Bill de Blasio
Mayor

BDB:jk

OFFICE OF THE BROOKLYN BOROUGH PRESIDENT

ERIC L. ADAMS
President

December 14, 2016

Honorable Anthony Foxx
Secretary
United States Department of Transportation
1200 New Jersey Avenue Southeast
Washington, DC 20590

Re: Letter of support from Borough President Adams for USDOT's Automated Vehicle Proving Ground Pilot Program

Dear Secretary Foxx:

As Brooklyn's borough president, the safety and security of all Brooklynites is my greatest priority. For that reason and so many others, I am happy to support New York City as a designated Community of Practice in the United States Department of Transportation's (USDOT) Automated Vehicle Proving Ground Pilot Program.

Brooklyn is a hub of technical innovation, and we are additionally striving to meet the City's Vision Zero objective of no pedestrian deaths as a result of vehicular crashes. Our involvement in this pilot program would do much in advancing Vision Zero's safety goals, by preparing automated vehicles for busy city streets, while also ensuring the safe deployment of this technology in urban areas across the country.

I am committed to transit equity for all Brooklynites. Shared, on-demand automated vehicles is an interesting idea to address the mobility challenges that far too many Brooklyn residents continue to face, particularly given our growing population of seniors and those with disabilities, for whom our subway system is largely inaccessible. Upgrades must be implemented in order for vehicles to be made more accessible, affordable, and distributed equitably across the five boroughs, and connecting New York City with other test facilities and peer cities across the country will help ensure that this technology develops in a way that supports our cities and their diverse populations.

USDOT has already awarded New York City $20 million to participate in the Connected Vehicles Pilot Program, recognizing the crucial role we have played at the forefront of advanced transportation management. I urge you to help us advance these efforts, and allow the City to build on the Connected Vehicle Pilot in order to examine the intersection of automated and connected vehicle systems.

The convergence of these technologies will save more lives than either can separately, making it imperative that the lessons from this pilot be advanced swiftly and shared widely. The City's designation as an Automated Vehicle Proving Ground will support these aims.

I look forward to building on this framework to create a robust testing program that advances AV technology while serving communities. Thank you for your support of this important initiative.

Sincerely,

Eric L. Adams
Brooklyn Borough President

ELA/es

DISTRICT OFFICE
618 WEST 177TH STREET
NEW YORK, NY 10033
(917) 521-2616
FAX: (917) 521-1293

CITY HALL OFFICE
250 BROADWAY, ROOM 1763
NEW YORK, NEW YORK 10007
(212) 788-7053
FAX: (212) 227-1215
http://council.nyc.gov/d10/html/members/home.shtml

THE COUNCIL OF
THE CITY OF NEW YORK

YDANIS RODRIGUEZ
COUNCIL MEMBER, 10TH DISTRICT, MANHATTAN

CHAIR
TRANSPORTATION

COMMITTEES
FINANCE
LAND USE
HOUSING & BUILDINGS
HIGHER EDUCATION
EDUCATION

SUBCOMMITTEE
PLANNING, DISPOSITIONS & CONCESSIONS

December 12, 2016

Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Secretary Foxx,

I am writing to urge you to designate New York City as a Community of Practice in the USDOT Automated Vehicle Proving Ground Pilot Program. Involvement in pilot will not only advance the City's Vision Zero safety goals by preparing automated vehicles for busy city streets, but will also ensure the safe deployment of this technology in urban areas across the country.

Shared, on-demand automated vehicles present one of the most compelling solutions to the mobility challenges that too many New Yorkers continue to face – especially the growing population of senior citizens and people with disabilities, for whom the subway system is largely unusable. However, in order to provide these accessibility improvements, vehicles must be affordable, accessible, and distributed equitably across the five boroughs. Connecting New York with other test facilities and peer cities across the country will help ensure that this technology develops in a way that supports our cities and their diverse populations.

USDOT recognized New York City's unique opportunity to be a frontrunner in advanced transportation management when it awarded the City $20 million to participate in the Connected Vehicles Pilot Program. With that effort well underway, I ask that you once again affirm New York's unique position, and allow the City to build on the Connected Vehicle Pilot to examine the intersection of automated and connected vehicle systems. The convergence of these technologies will save more lives than either can separately, making it imperative that the lessons from this pilot be advanced swiftly and shared widely. The City's designation as an Automated Vehicle Proving Ground will support these aims.

The City's traffic-safety initiative, Vision Zero, has already made remarkable strides. In 2015, there were fewer traffic deaths on our streets than any year since 1910, even as the death toll

increased nationally. NYC has built an ambitious Vision Zero program that combines policy, engineering and education, and will build on this framework to create a robust testing program that advances AV technology while serving communities.

I strongly support New York City's development of an Automated Vehicle Pilot that safely tests the deployment of these technologies, and I believe designation as an Automated Vehicle Proving Ground, and the access to the Community of Practice that comes with it, will enable us to get there faster. I thank you for your support of this important initiative.

Sincerely,

Ydanis Rodriguez
Council Member, District 10

December 16, 2016

Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Secretary Foxx,

I am writing to urge you to designate New York City as a Community of Practice in the USDOT Automated Vehicle Proving Ground Pilot Program. Involvement in pilot will not only advance the City's Vision Zero safety goals by preparing automated vehicles for busy city streets, but will also ensure the safe deployment of this technology in urban areas across the country.

Shared, on-demand automated vehicles present one of the most compelling solutions to the mobility challenges that too many New Yorkers continue to face – especially the growing population of senior citizens and people with disabilities, for whom the subway system is largely unusable. However, in order to provide these accessibility improvements, vehicles must be affordable, accessible, and distributed equitably across the five boroughs. Connecting New York with other test facilities and peer cities across the country will help ensure that this technology develops in a way that supports our cities and their diverse populations.

USDOT recognized New York City's unique opportunity to be a frontrunner in advanced transportation management when it awarded the City $20 million to participate in the Connected Vehicles Pilot Program. With that effort well underway, I ask that you once again affirm New York's unique position, and allow the City to build on the Connected Vehicle Pilot to examine the intersection of automated and connected vehicle systems. The convergence of these technologies will save more lives than either can separately, making it imperative that the lessons from this pilot be advanced swiftly and shared widely. The City's designation as an Automated Vehicle Proving Ground will support these aims.

The City's traffic-safety initiative, Vision Zero, has already made remarkable strides. In 2015, there were fewer traffic deaths on our streets than any year since 1910, even as the death toll increased nationally. NYC has built an ambitious Vision Zero program that combines policy, engineering and education, and will build on this framework to create a robust testing program that advances AV technology while serving communities.

Though automated vehicles have the potential to bring the city great opportunities with respect to safety and sustainability, I am also cognizant of the risks that automated vehicles will bring to our local economy. Many New Yorkers make a good living driving vehicles in and around our City. From taxi and bus drivers to commercial delivery drivers and mail carriers, these workers provide our communities with essential services. Automated vehicles, therefore, have the potential to displace thousands of workers in coming decades. It is essential that NYC develop and implement an inclusive and equitable transition plan that ensures these workers have a clear

path to financial stability even in the face of job displacement. We would be eager to work with you and other cities to accomplish this.

I strongly support New York City's development of an Automated Vehicle Pilot that safely tests the deployment of these technologies, and I believe designation as an Automated Vehicle Proving Ground, and the access to the Community of Practice that comes with it, will enable us to get there faster. I thank you for your support of this important initiative.

Sincerely,

Council Member Brad S. Lander
Deputy Leader for Policy
New York City Council

NYCEDC
New York City Economic Development Corporation

Maria Torres-Springer
President & CEO

Tel: 212.312.3500
Fax: 212.312.3913
mtorres-springer@edc.nyc

December 19, 2016

Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Secretary Foxx,

I am writing to urge you to support NYC DOT's application to designate New York City as a Community of Practice in the USDOT Automated Vehicle Proving Ground Pilot Program. Involvement in pilot will not only advance the City's Vision Zero safety goals by preparing automated vehicles for busy city streets, but will also ensure the safe deployment of this technology in urban areas across the country.

Shared, on-demand automated vehicles present one of the most compelling solutions to the mobility challenges that too many New Yorkers continue to face – especially the growing population of senior citizens and people with disabilities, for whom the subway system is largely unusable. However, in order to provide these accessibility improvements, vehicles must be affordable, accessible, and distributed equitably across the five boroughs. Connecting New York with other test facilities and peer cities across the country will help ensure that this technology develops in a way that supports our cities and their diverse populations.

USDOT recognized New York City's unique opportunity to be a frontrunner in advanced transportation management when it awarded the City $20 million to participate in the Connected Vehicles Pilot Program. With that effort well underway, I ask that you once again affirm New York's unique position, and allow the City to build on the Connected Vehicle Pilot to examine the intersection of automated and connected vehicle systems. The convergence of these technologies will save more lives than either can separately, making it imperative that the lessons from this pilot be advanced swiftly and shared widely. The City's designation as an Automated Vehicle Proving Ground will support these aims.

The City's traffic-safety initiative, Vision Zero, has already made remarkable strides. In 2015, there were fewer traffic deaths on our streets than any year since 1910, even as the death toll increased nationally. NYC has built an ambitious Vision Zero program that combines policy, engineering and education, and will build on this framework to create a robust testing program that advances AV technology while serving communities.

As the President at New York City Economic Development Corporation (NYCEDC), I strongly support New York City's development of an Automated Vehicle Pilot that safely tests the deployment of these technologies, and I believe designation as an Automated Vehicle Proving Ground, and the access to the Community of Practice that comes with it, will enable us to get there faster. NYCEDC operates or collaborates with several sites where automated vehicles hold particular promise to address mobility challenges,

including the Brooklyn Army Terminal, Governors Island, and the Brooklyn Navy Yard. Additionally, NYCEDC supports the development of technology industries and the deployment of innovative technologies that support New York City's neighborhoods and economy. I thank you for your support of this important initiative.

Sincerely,

Maria Torres-Springer

THE TRUST FOR
GOVERNORS ISLAND

10 South Street, Slip 7
New York, NY 10004
T 212.440.2200
F 212.480.4320
govisland.com

December 16, 2016

Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Secretary Foxx,

I am writing to strongly urge you to designate New York City as a Community of Practice in the USDOT Automated Vehicle Proving Ground Pilot Program. Involvement in this pilot will not only advance the City's Vision Zero safety goals by preparing automated vehicles for busy city streets, but will also ensure the safe deployment of this technology in urban areas across the country.

Governors Island, a 172 acre island in New York Harbor, just a 5 minute ferry ride from Manhattan and Brooklyn would be a perfect place to deploy this program. We have 5 miles of private roads and no private vehicles on the Island. We could be a perfect testing ground for this type of technology since we are an island, independent from the rest of the city streets, where these vehicles can safely be tested.

Shared, on-demand automated vehicles present one of the most compelling solutions to the mobility challenges that too many New Yorkers continue to face – especially the growing population of senior citizens and people with disabilities, for whom the subway system is largely unusable. However, in order to provide these accessibility improvements, vehicles must be affordable, accessible, and distributed equitably across the five boroughs. Connecting New York with other test facilities and peer cities across the country will help ensure that this technology develops in a way that supports our cities and their diverse populations.

USDOT recognized New York City's unique opportunity to be a frontrunner in advanced transportation management when it awarded the City $20 million to participate in the Connected Vehicles Pilot Program. With that effort well underway, I ask that you once again affirm New York's unique position, and allow the City to build on the Connected Vehicle Pilot to examine the intersection of automated and connected vehicle systems. The convergence of these technologies will save more lives than either can separately, making it imperative that the lessons from this pilot be advanced swiftly and shared widely. The City's designation as an Automated Vehicle Proving Ground will support these aims.

THE TRUST FOR
GOVERNORS ISLAND

The City's traffic-safety initiative, Vision Zero, has already made remarkable strides. In 2015, there were fewer traffic deaths on our streets than any year since 1910, even as the death toll increased nationally. NYC has built an ambitious Vision Zero program that combines policy, engineering and education, and will build on this framework to create a robust testing program that advances AV technology while serving communities.

I strongly support New York City's development of an Automated Vehicle Pilot that safely tests the deployment of these technologies, and I believe designation as an Automated Vehicle Proving Ground, and the access to the Community of Practice that comes with it, will enable us to get there faster. I thank you for your support of this important initiative.

10 South Street, Slip 7
New York, NY 10004
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govisland.com

Sincerely,

Michael M. Samuelian FAIA, AICP
President & CEO
The Trust for Governors Island

NY TECH ALLIANCE

December 14, 2016

Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Secretary Foxx,

On behalf the NY Tech Alliance, as well as the other members of the New York tech ecosystem, I am writing to urge you to designate New York City as a Community of Practice in the USDOT Automated Vehicle Proving Ground Pilot Program. Involvement in pilot will not only advance the City's Vision Zero safety goals by preparing automated vehicles for busy city streets, but will also ensure the safe deployment of this technology in urban areas across the country.

As you may know, the NY Tech Alliance is a non-profit organization whose mission is to represent, inspire, support, and help lead the New York technology community and ecosystem to create a better future for all. Our organization consists of over 60,000 members.

Shared, on-demand automated vehicles present one of the most compelling solutions to the mobility challenges that too many New Yorkers continue to face – especially the growing population of senior citizens and people with disabilities, However, in order to provide these accessibility improvements, vehicles must be affordable, accessible, and distributed equitably across the five boroughs. Connecting New York with other test facilities and peer cities across the country will help ensure that this technology develops in a way that supports our cities and their diverse populations.

The City's traffic-safety initiative, Vision Zero, has already made remarkable strides. In 2015, there were fewer traffic deaths on our streets than any year since 1910, even as the death toll increased nationally. NYC has built an ambitious Vision Zero program that combines policy, engineering and education, and will build on this framework to create a robust testing program that advances AV technology while serving communities. In addition to helping solve the many technical issues, the City is committed to planning for the anticipated labor market impacts of automated vehicles.

We strongly support New York City's development of an Automated Vehicle Pilot that safely tests the deployment of these technologies, and I believe designation as an Automated Vehicle Proving Ground, and the access to the Community of Practice that comes with it, will enable us to get there as quickly as practicable. I thank you for your support of this important initiative.

Sincerely,

Erik K. Grimmelmann, Ph.D.
President

PARTNERSHIP
for New York City

One Battery Park Plaza, 5th Floor
New York, NY 10004
pfnyc.org

December 15, 2016

Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Secretary Foxx,

On behalf of the Partnership for New York City, a nonprofit organization representing the city's business leaders and largest private sector employers, we urge designation of New York City as a Community of Practice in the Automated Vehicle Proving Ground Pilot Program. New York City has the country's most focused and comprehensive program for improving vehicular safety, known as Vision Zero, which positions us well to test the deployment of automated vehicles in a highly congested urban setting.

Shared, on-demand automated vehicles would help us address increasing congestion, logistics and mobility challenges. For example, we have a growing population of senior citizens and people with disabilities, for whom the subway system is largely unusable. We need to explore transportation alternatives that are affordable, accessible, and safe and automated vehicles are a compelling possibility.

USDOT recognized New York City's unique opportunity to be a frontrunner in advanced transportation management when it awarded the City $20 million to participate in the Connected Vehicles Pilot Program. With that effort well underway, we now hope to examine the intersection of automated and connected vehicle systems. The convergence of these technologies will save more lives together than separately. The City's designation as an Automated Vehicle Proving Ground will support these aims.

The City's traffic-safety initiative, Vision Zero, has already made significant progress. In 2015, there were fewer traffic deaths on our streets than in any year since 1910, even as the death toll increased nationally. NYC has built an ambitious Vision Zero program that combines policy, engineering and education, and will build on this framework to create a robust testing program that advances AV technology while serving communities.

The Partnership for New York City strongly supports New York City's development of an Automated Vehicle Pilot that safely tests the deployment of these technologies. Designating New York City as an Automated Vehicle Proving Ground, and the access to the Community of Practice that comes with it, will enable us to get there faster. I thank you for your support of this important initiative.

Sincerely,

Kathryn S. Wylde
President & CEO
Partnership for New York City

REGION II
UNIVERSITY TRANSPORTATION RESEARCH CENTER

CAMILLE KAMGA
DIRECTOR

REGION II

New Jersey

New York

Puerto Rico

CONSORTIUM MEMBERS

City University of New York
Clarkson University
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New Jersey Institute of Technology
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Rutgers University*
State University of New York
Stevens Institute of Technology
Syracuse University
The College of New Jersey
University of Puerto Rico

* Membership under SAFETEA-LU Legislation

December 15, 2016

Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Secretary Foxx,

I am writing to urge you to designate New York City as a Community of Practice in the USDOT Automated Vehicle Proving Ground Pilot Program. Involvement in pilot will not only advance the City's Vision Zero safety goals by preparing automated vehicles for busy city streets, but will also ensure the safe deployment of this technology in urban areas across the country.

Shared, on-demand automated vehicles present one of the most compelling solutions to the mobility challenges that too many New Yorkers continue to face – especially the growing population of senior citizens and people with disabilities, for whom the subway system is largely unusable. However, in order to provide these accessibility improvements, vehicles must be affordable, accessible, and distributed equitably across the five boroughs. Connecting New York with other test facilities and peer cities across the country will help ensure that this technology develops in a way that supports our cities and their diverse populations.

USDOT recognized New York City's unique opportunity to be a frontrunner in advanced transportation management when it awarded the City $20 million to participate in the Connected Vehicles Pilot Program. With that effort well underway, I ask that you once again affirm New York's unique position, and allow the City to build on the Connected Vehicle Pilot to examine the intersection of automated and connected vehicle systems. The convergence of these technologies will save more lives than either can separately, making it imperative that the lessons from this pilot be advanced swiftly and shared widely. The City's designation as an Automated Vehicle Proving Ground will support these aims.

The City's traffic-safety initiative, Vision Zero, has already made remarkable strides. In 2015, there were fewer traffic deaths on our streets than any year since 1910, even as the death toll increased nationally. NYC has built an ambitious Vision Zero program that combines policy, engineering and education, and will build on this framework to create a robust testing program that advances AV technology while serving communities.

MARSHAK HALL ROOM 910
THE CITY COLLEGE NEW YORK NEW YORK 10031 212-650-8050 FAX 212-650-8374
WWW.UTRC2.ORG

I strongly support New York City's development of an Automated Vehicle Pilot that safely tests the deployment of these technologies, and I believe designation as an Automated Vehicle Proving Ground, and the access to the Community of Practice that comes with it, will enable us to get there faster. I thank you for your support of this important initiative.

Sincerely,

Camille Kamga, Ph.D.
Director

MANHATTAN
CHAMBER OF
COMMERCE

December 14, 2016

Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Secretary Foxx:

I am writing to urge you to designate New York City as a Community of Practice in the USDOT Automated Vehicle Proving Ground Pilot Program. Involvement in pilot will not only advance the City's Vision Zero safety goals by preparing automated vehicles for busy city streets, but will also ensure the safe deployment of this technology in urban areas across the country.

Shared, on-demand automated vehicles present one of the most compelling solutions to the mobility challenges that too many New Yorkers continue to face – especially the growing population of senior citizens and people with disabilities, for whom the subway system is largely unusable. However, in order to provide these accessibility improvements, vehicles must be affordable, accessible, and distributed equitably across the five boroughs. Connecting New York with other test facilities and peer cities across the country will help ensure that this technology develops in a way that supports our cities and their diverse populations.

USDOT recognized New York City's unique opportunity to be a frontrunner in advanced transportation management when it awarded the City $20 million to participate in the Connected Vehicles Pilot Program. With that effort well underway, I ask that you once again affirm New York's unique position, and allow the City to build on the Connected Vehicle Pilot to examine the intersection of automated and connected vehicle systems. The convergence of these technologies will save more lives than either can separately, making it imperative that the lessons from this pilot be advanced swiftly and shared widely. The City's designation as an Automated Vehicle Proving Ground will support these aims.

The City's traffic-safety initiative, Vision Zero, has already made remarkable strides. In 2015, there were fewer traffic deaths on our streets than any year since 1910, even as the death toll increased nationally. NYC has built an ambitious Vision Zero program that combines policy, engineering and education, and will build on this framework to create a robust testing program that advances AV technology while serving communities.

1120 AVENUE OF AMERICAS, 4TH FLOOR
NEW YORK, NY 10036
PHONE: 212 473 7875
WWW.MANHATTANCC.ORG

I strongly support New York City's development of an Automated Vehicle Pilot that safely tests the deployment of these technologies, and I believe designation as an Automated Vehicle Proving Ground, and the access to the Community of Practice that comes with it, will enable us to get there faster. I thank you for your support of this important initiative.

Sincerely,

Jessica Walker
President & CEO

Brooklyn Chamber
of Commerce

December 14, 2016

Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Secretary Foxx,

I am writing to urge you to designate New York City as a Community of Practice in the USDOT Automated Vehicle Proving Ground Pilot Program. Involvement in the pilot will not only advance the City's Vision Zero safety goals by preparing automated vehicles for busy city streets, but will also ensure the safe deployment of this technology in urban areas across the country.

The Brooklyn Chamber of Commerce (BCC) is a membership-based business assistance organization which represents the interests of over 2,200 member businesses, as well as other businesses across the borough of Brooklyn. The Brooklyn Alliance is the not-for-profit economic development organization of the BCC, which works to address the needs of businesses through direct business assistance programs for all industry sectors.

Shared, on-demand automated vehicles present one of the most compelling solutions to the mobility challenges that too many New Yorkers continue to face – especially the growing population of senior citizens and people with disabilities, for whom the subway system is largely unusable.

USDOT recognized New York City's unique opportunity to be a frontrunner in advanced transportation management when it awarded the city $20 million to participate in the Connected Vehicles Pilot Program. With that effort, well underway, I ask that you once again affirm New York's unique position, and allow the City to build on the Connected Vehicle Pilot to examine the intersection of automated and connected vehicle systems.

I strongly support New York City's development of an Automated Vehicle Pilot that safely tests the deployment of these technologies, and I believe designation as an Automated Vehicle Proving Ground, and the access to the Community of Practice that comes with it, will enable us to get there faster. I thank you for your support of this important initiative.

Sincerely,

Andrew Hoan
Acting President and CEO
Brooklyn Chamber of Commerce

Cc: Polly Trottenberg, NYCDOT Commissioner

AH/al

335 Adams Street, Suite 2700
Brooklyn, NY 11201
t: 718-875-1000
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