Photo Source: USDOT

Connected Vehicle Pilot Deployment Program:

NEW YORK CITY, NEW YORK

LIMIT 35 SAFETY

MOBILITY

ENVIRONMENT

According to the National Highway Traffic Safety Administration (NHTSA), speeding was a factor in more than one in four deaths in New York City. Moreover, human factors were the critical cause in about 94 percent of all crashes, while vehicle-related factors applied only to about 2 percent of all crashes. These traffic incidents (e.g., crashes, stuck oversize vehicles) cause significant delays, injuries, fatalities, and vehicle and infrastructure damage.

Photo Source: MTA New York City Transit

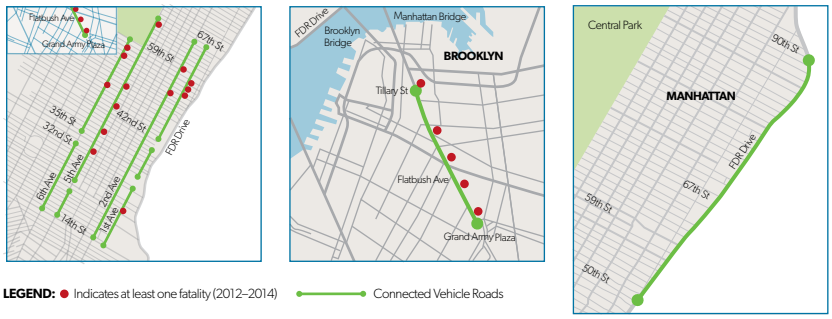
Manhattan, in particular, has high levels of pedestrian traffic, which result in frequent interactions between pedestrians and vehicles. Seventy-three percent of all crash fatalities in the area involved pedestrians compared to 14 percent nationwide. Senior citizens over the age of 65 comprise 12 percent of the population in New York City but about 33 percent of all pedestrian fatalities. In addition, the primary reason for crash-related deaths of children under 14 was from being struck by a vehicle.

New York City Connected Vehicle Pilot

The New York City Connected Vehicle Pilot aims to improve the safety of travelers and pedestrians in the city through the deployment of connected vehicle technologies. This objective directly aligns with the city's Vision Zero initiative, which began in 2014 to reduce the number of fatalities and injuries resulting from traffic crashes.

Led by the New York City Department of Transportation (NYCDOT), the pilot aims to reduce crash frequency and severity, manage vehicle speeds (to the regulatory limit), and evaluate the benefits of deploying connected vehicle technology in a dense urban environment with frequent interactions among the participating vehicles.

New York City Department of Transportation – Connected Vehicle Map



LEGEND: ● Indicates at least one fatality (2012–2014) —●— Connected Vehicle Roads

Connected Vehicle Pilot Deployment Program

Sponsored by the U.S. Department of Transportation (USDOT) Intelligent Transportation Systems Joint Program Office, the Connected Vehicle Pilot Deployment Program is a national effort to deploy, test, and operationalize cutting-edge mobile and roadside technologies and enable multiple connected vehicle applications.

In early September 2015, the USDOT awarded three cooperative agreements collectively worth more than $45 million to three sites for the regional connected vehicle pilots:

- New York City, New York
- Wyoming
- Tampa, Florida.

The locations were selected in a competitive process to go beyond traditional vehicle technologies to help drivers better use the roadways to get to work and appointments, relieve the stress caused by bottlenecks, and communicate with pedestrians on cell phones of approaching vehicles.

U.S. Department of Transportation

Approach

New York City'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. It is anticipated to be the largest connected vehicle technology deployment to date. The pilot area encompasses three distinct 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. The second area includes four one-way corridors in Manhattan. The third area covers a 1.6-mile segment of Flatbush Avenue in Brooklyn.

The NYCDOT's approach is to:

- Deploy connected vehicle technology in large fleets that operate in the same area
- Provide system capabilities to manage the large fleets and their safety applications
- Measure the system's performance while preserving privacy for fleet owners' and participants' personally identifiable information
- Focus on the stability and robustness of the roadside unit (RSU) and onboard unit (OBU) "platforms" to support Over-the-Air (OTA) software updates and data collection
- Require that the operation of the applications can be adjusted and "tuned" for the characteristics of the dense urban environment and variety of driving conditions within New York City.

Partners

The New York City Connected Vehicle Pilot includes a diverse team of stakeholders:

- NYCDOT Bureau of Traffic Operations
- NYCDOT IT Department
- New York City Department of Information Technology and Telecommunications
- NYCDOT Fleets
- Taxi and Limousine Commission and Taxi Fleets
- Metropolitan Transportation Authority (MTA) / New York City Transit
- New York City Department of Sanitation (DSNY)
- United Parcel Service (UPS)
- Pedestrians for Accessible and Safe Streets Coalition.

Applications

The New York City Pilot will deploy the following applications on participating vehicles.

Vehicle-to-Vehicle (V2V) Safety Applications

- **Forward Crash Warning –** Alerts the driver in the event of an imminent rear-end crash with a remote vehicle ahead
- **Emergency Electronic Brake Lights –** Alerts the driver of stopped or hard-braking vehicle(s) ahead in time to safely avoid a crash
- **Blind Spot Warning –** Alerts the driver when a remote vehicle is in the adjacent lane in the same direction of travel to avoid side-swipe crash
- **Lane Change Warning –** Alerts the driver during a lane change attempt when a remote vehicle is in the adjacent lane in the same direction of travel to avoid side-swipe crash
- **Intersection Movement Assist –** Alerts the driver attempting to cross or turn when it is not safe to enter the intersection
- **Vehicle Turning Right in Front of Bus Warning –** Alerts the bus operator if a remote vehicle attempts to pull in front of the bus to make a right turn

Vehicle-to-Infrastructure (V2I) Safety Applications

- **Speed Compliance –** Alerts the driver when exceeding the posted regulatory speed limit
- **Curve Speed Compliance –** Alerts the driver when approaching a curve and exceeding the posted regulatory speed limit
- **Speed Compliance in Work Zone –** Alerts the driver when approaching a designated work or school zone and exceeding the speed limit
- **Red Light Violation Warning –** Alerts the driver of impending red light violations
- **Oversize Vehicle Compliance –** Alerts the driver of restricted roadways and impending height-restricted infrastructure such as bridge or tunnel clearance
- **Emergency Communications and Evacuation Information –** Alerts the driver of New York City's emergency and evacuation traveler information obtained from the Traffic Management Center, Office of Emergency Management, Office of Emergency Response, and the National Weather Service

Deployment by the Numbers

The New York City Connected Vehicle Pilot is deploying:

- Up to 8,000 fleet vehicles and at least 5 vehicle types:
  - 5,850 taxis
  - 1,250 MTA buses
  - 400 UPS vehicles
  - 250 NYCDOT fleet vehicles
  - 250 DSNY vehicles
- 353 RSUs :
  - RSUs at approximately 310 signalized intersections
    - Manhattan:
      - 202 intersections on the arterials (1st, 2nd, 5th, and 6th Avenues)
      - 79 intersections on the cross streets (14th, 23rd, 34th, 42nd, and 57th Streets)
    - Brooklyn: 28 intersections on Flatbush Avenue
  - 8 RSUs on FDR Drive
  - 36 RSUs at support locations outside the pilot area (e.g., river crossings, airports, and vehicles garages)

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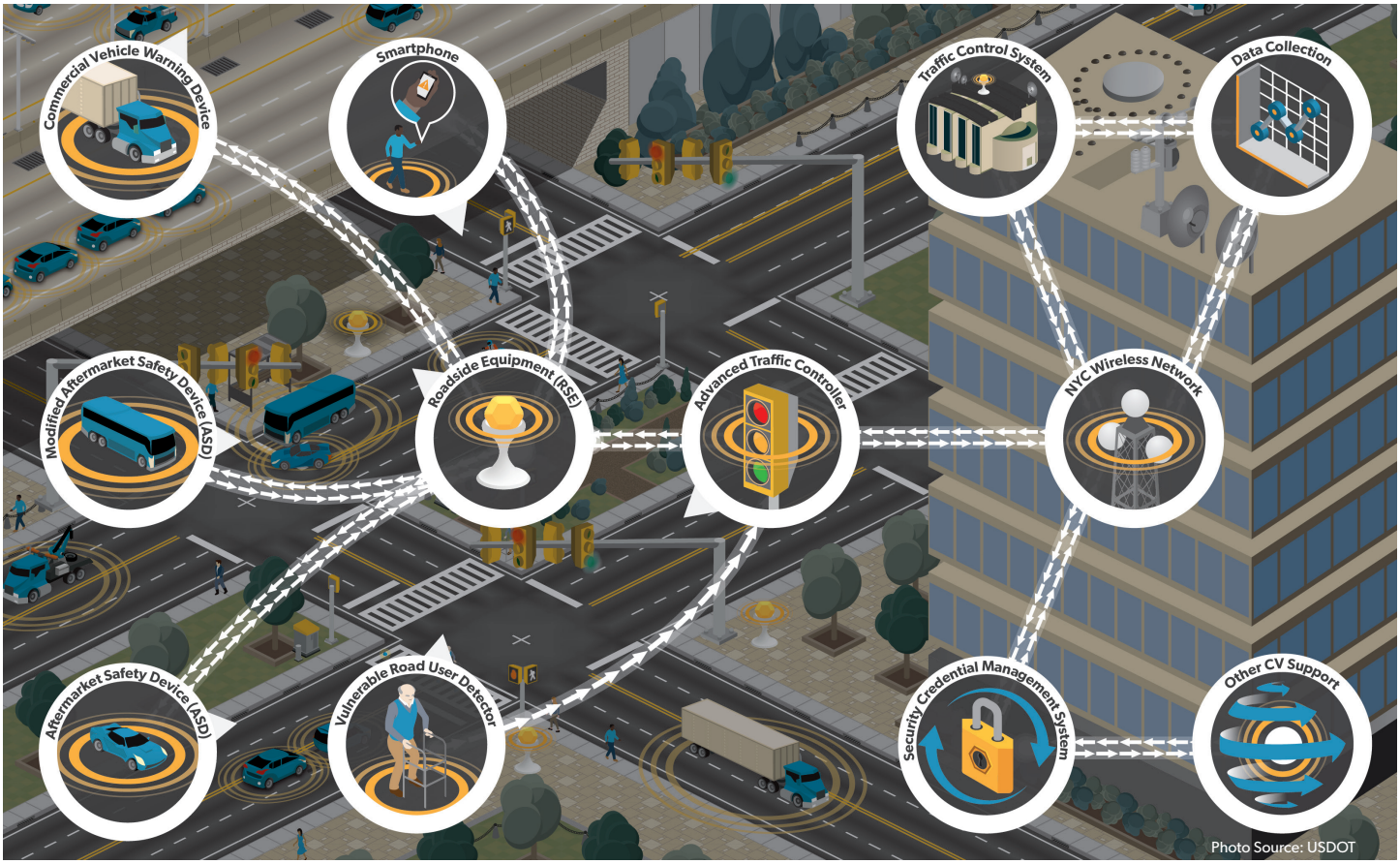

Photo Source: USDOT

V2I Pedestrian Applications

- **Pedestrian in Signalized Crosswalk –** Alerts the driver of the presence of pedestrians crossing at a signalized intersection
- **Mobile Accessible Pedestrian Signal System –** Informs the visually-impaired or audibly-impaired pedestrian of the pedestrian signal status and provides orientation to the crosswalk to assist in crossing the street

Additional applications being deployed include:

- Support applications for configuration and system management; these will monitor the radio frequency performance, monitor the overall health of the system elements including aftermarket safety devices and RSUs, manage the software operation of the units, and support OTA software updates and application management (tuning)
- Applications to collect data associated with driver warnings and alerts to support the evaluation of the safety benefits
- Vehicle traffic sensor application for integration of connected vehicle technology with New York City's Midtown in Motion adaptive traffic signal system.

Connected vehicle technology has yet to be deployed in a high-density environment like New York City. With its mix of high pedestrian and vehicle traffic and commercial and residential areas, the New York City Connected Vehicle Pilot will be a model for future large-scale deployments in urban environments. The New York City pilot is expected to be operational in April 2018.

All three of the Connected Vehicles Pilot sites have developed videos showcasing their work. View the videos on YouTube at:

Tampa (THEA) — https://www.youtube.com/watch?v=2dTewlp0ujo
Wyoming (WYDOT) — https://www.youtube.com/watch?v=9TPluh2dm20
New York City (NYCDOT) — https://www.youtube.com/playlist?list=PL48fn16R8Rdy6aRkSEA328ZgXtYPRntWj

For more information, please visit http://www.its.dot.gov/pilots/pilots_nycdot.htm, https://www.cvp.nyc/, *or contact:*

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Ready to bring the transportation revolution to your community?

Discover best practices from connected vehicle leaders and early deployers.

Connected vehicle technologies are already being deployed around the country from major cities in Florida and New York to the highways of rural Wyoming. If you are interested in using these revolutionary technologies, visit the Connected Vehicle Pilot Deployment Program's website. This comprehensive website contains FREE up-to-date resources for connected vehicle deployment.

- Updates from the Connected Vehicle Pilot locations
- Pre-recorded webinars showing how other communities are deploying the technology
- Sample deployment concepts
- In-depth planning documents from the sites that can assist you in planning for your community
- Fact sheets you can share with your colleagues
- Other vehicle-to-infrastructure deployment resources

www.its.dot.gov/pilots

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