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New York City Connected Vehicle Pilot Optimizes RSU Installation Practices

Device installation is a key stage of the Connected Vehicle (CV) Pilots as Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) technologies are deployed into the field in large quantities. The CV Pilot teams are working hard to ensure efficient, reliable, and quality installations, while documenting lessons learned from the process for future deployers of CV technology.

One of the lessons learned from the New York City Department of Transportation (NYCDOT) Pilot regards the installation of the 450 roadside units (RSUs) NYCDOT had to install alongside signalized intersections. While preparing the installations, preliminary site inspections were performed to select mast arm locations for the RSUs. These sites typically extended into the intersections to provide line-of-sight for approaches from every direction without altering the intersection's existing poles, mast arms, and cabinet locations.

The initial installation method was to fasten RSUs directly to the mast arms approximately 18” from the signal head hanger, as shown in Figure 1 & Figure 2. However, shortly after the prototype unit installations were complete, high winds occurred that caused a signal head to swing far enough to break an RSU antenna. This triggered a quest for an alternative installation method that could withstand high winds.



Figure 1: Initial Installation Approach
Source: NYCDOT



Figure 2: Revised Installation Approach
Source: NYCDOT

After several experiments, the team selected a vertically mounted extension (shown in Figure 3) that provided several advantages. In addition to reducing the potential for antenna damage, the key advantage was that the RSU and mounting devices were preassembled, reducing the time installation crews needed to be in the air to attach equipment to the mast arm. Secondly, the equipment cabling reduced the necessary overhead work yet provided the same benefits.

Equipment grounding is critical to the installation of the equipment and was easier to maintain with the revised mounting arrangement. Finally, the additional height improves line-of-sight and reduces the impacts of other devices mounted on the mast arm. The revised installation method has been a big win for the maintenance crews. Figure 4, Figure 5 and Figure 6 are examples of the final configuration as installed on the mast arms in Manhattan.



Figure 3: Vertical Extension Rod Mounting
Source: NYCDOT



Figure 4: Example of Alternative Field Mounting
Source: NYCDOT



Figure 5: Alternative Mounting
Source: NYCDOT



Figure 6: Example of Alternative Field Mounting
Source: NYCDOT

For more lessons learned about the procurement and installation of connected vehicle devices from the three pilot sites, see the sites' Acquisition and Installation [webinars](#). In these webinars, representatives from each of the pilot sites provide an overview of their lessons learned from engaging with vendors and getting the devices in hand and installed while adhering to a stringent installation schedule.

[Office of the Assistant Secretary for Research and Technology \(OST-R\) • U.S. Department of Transportation \(US DOT\)](#)

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