New York City Department of Transportation Connected Vehicle Pilot
Operational Capability Showcase (OCS) Webinar – July 20, 2021

Webinar Q&A

1. **Q: In this deployment, what was the typical ratio of Connected Vehicles to non-Connected Vehicles during regular traffic conditions? (e.g., 1 CV to 10 non-CVs?)**

   A: Our total population of vehicles is 3,000 and with >1M cars typically in motion within NY City boundaries, the ratio is very, very small.

2. **Q: What software is the NYCDOT CV Pilot using?**

   A: The system consists of various devices using specific software "packages" that meet system requirements as follows:

   - ***ASD/OBU*** *use software provided by the vendor, Danlaw;*
   - ***RSU*** *uses software provided by the vendor, Siemens.*
   - ***ATC*** *(traffic controller) uses software provided by the vendor, Peek Traffic, now Oriux.*
   - ***TMC*** *systems use software provided by several vendors including TransCore, and KLD Associates.*

3. **Q: On the NYC CVPD website, users can see the event data statistics, but these are very high level (i.e., only the amount of files uploaded / use cases). Do you plan to give access to more data or real-time monitors?**

   Another question re stats: data shows rare EEBL event, which is surprising for NYC traffic. Do the results confirm your expectation in terms of use case events?

   a) Obfuscated event data is available on the ITS DataHub. Data is uploaded daily or weekly depending on the amount of data collected. Obfuscated data protects privacy by altering location and time information from actual to common references while not altering the precision of the collected samples. Because of our data retention on vehicles until encountering connections to the back office, the value of "real-time" data is limited.

   b) EEBL requires that the leading [CV equipped] vehicle be travelling at sufficient speed when it experiences a "hard" braking event (i.e. -0.4g) and transmits the BSM noting same to surrounding vehicles; CV equipped vehicles following in the stream of traffic receive the message and alert the driver. Thus, both vehicles must be equipped with CV technology for this application to be triggered, both vehicles must exceed minimum speed thresholds, and the lead vehicle deceleration must exceed the minimum rate threshold, to trigger the alert. With these requirements and the low number of equipped vehicles, the number of EEBL events is very low.

4. **Q: What is the location accuracy achieved?**

   A: Our testing shows that using the triangulation in the urban canyons, we can achieve 1.5 Meter accuracy for 1 sigma.

5. **Q: Other than the NYC Fleet, have you received any data from private Party vehicle?**

A: Yes. A few vehicles are owned by non-governmental entities such as Anheuser-Busch and TransCore; otherwise the fleet is government owned.

6. **Q: How is the presence of a pedestrian detected for the pedestrian in crosswalk safety application? Is it based on a vehicle- or infrastructure-based sensor? What specific standard message is used for this application?**
   a) *Pedestrian detection uses infrastructure based infrared detection equipment focused on the crosswalks.*
   b) *The pedestrian presence is sent in the SPaT message in accordance with SAE J2735-2016.*

7. **Q: Same question for the location accuracy for the visually challenged pedestrian smartphone device.**

   A: We are unable to quantify that at this time. The vendor provided an auxiliary [external] location enhancement device to improve the location accuracy when using a Personal Information Device (i.e. smart phone). This is attached to the user's clothing/backpack and is used by the cellphone application in combination with the cellphone GPS information to track the pedestrian's location and orientation. Testing and improvements are on-going at this time.

8. **Q: For the pedestrian signal application (smartphone based), what is the wireless protocol used? Currently, smartphones do not support 802.11p protocol (DSRC/WAVE).**

   A: This is handled through the cellular (Verizon) service; the SPaT and MAP information is sent to TMC where it is processed and sent to the AWS cloud; there it is processed and sent to the smartphone application. Since the SPaT message provides time points to indicate when the pedestrian signal (WALK/DON'T WALK) will change state, the latencies through the cellular media do not affect the accuracy of the data.

9. **Q: With regard to pedestrian safety applications, how did you deal with the inherent inaccuracy of smart phone GPS, especially when made even less accurate in an urban environment with tall buildings?**

   A: Answered Live: *The vendor provided an auxiliary [external] location enhancement device to improve the accuracy. This is attached to the user's clothing/backpack and is used by the cellphone application in combination with the cellphone GPS information to track the pedestrian's location and orientation.*

10. **Q: The use of DSRC is great for V2V and V2I; however, how does this work into autonomous vehicles as Tesla uses cameras, and Google is using Lidar. How are autonomous vehicles suppose to "see" the lane lines to keep the car in the lane? How will this be implemented in highway driving, especially given that there are areas that are rural areas that do not even have cell phone service let alone power for the readers?**

    A: The CV technology will most likely augment other vehicle-based sensors as each sensor technology has limitations that must be accounted for in the overall system. Some sensor technologies experience limitations due to adverse weather conditions (e.g. sunshine, precipitation) or obstructions (occlusion due to other vehicles, structures). CV communications can assist AV operation by providing information about the infrastructure (e.g. MAP messages) *that can aid navigation when lane markings, signals, and signage may be difficult to detect. CV communications (e.g. Basic Safety Messages) provides additional information to the AV system that would otherwise not be available such as brake status, acceleration, path history, and path prediction from nearby vehicles.*

11. **Q: Were any cyber-attacks identified during the project?**

    A: No comment. The City protects Personally Identifiable Information and addresses cyber security issues when necessary.

12. **Q: What are the measured numbers of the project?**

    A: *We are monitoring the number of event records we receive, the number of each type of event detected, the number of V2V, V2I, and I2V sightings, the number of OBUs we hear from, and various other OBU and RSU health checks. Slide 43 provides an example of the events (alerts/warnings) and the distribution among the various types. Slide 20 provides statistics for our fleet in terms of BSMs generated, VMT, and vehicle hours of operation. If you review the documents available on the USDOT pilot site, you will be able to find more detailed information on the data being collected.*

13. **Q: With the exception of the pedestrian application, all V2V +V2I apps seem 100% dependent on 5.9 GHz DSRC transportation protocol. How does the recent FCC ruling and AASHTO + ITSA lawsuit impact the future of such CV apps in NYC and elsewhere?**

    A: Refer to the reply in #15 below.

14. **Q: Are you considering deploying 5G or WiFi technology for the NYC CV testbed and do we need 5G infrastructure in the first place?**

    A: Refer to the reply in #15 below.

15. **Q: Given the FCC's recent ruling, what are the future plans for the NYC deployment?**

    A: The project team is beginning to prepare the transition plan for operation beyond the project completion at the end of the year. The FCC First Report & Order is only one of the constraints in developing that plan. Please stay tuned for the final publication of the plan and our webinar on the project's performance measurement results and transition plan.