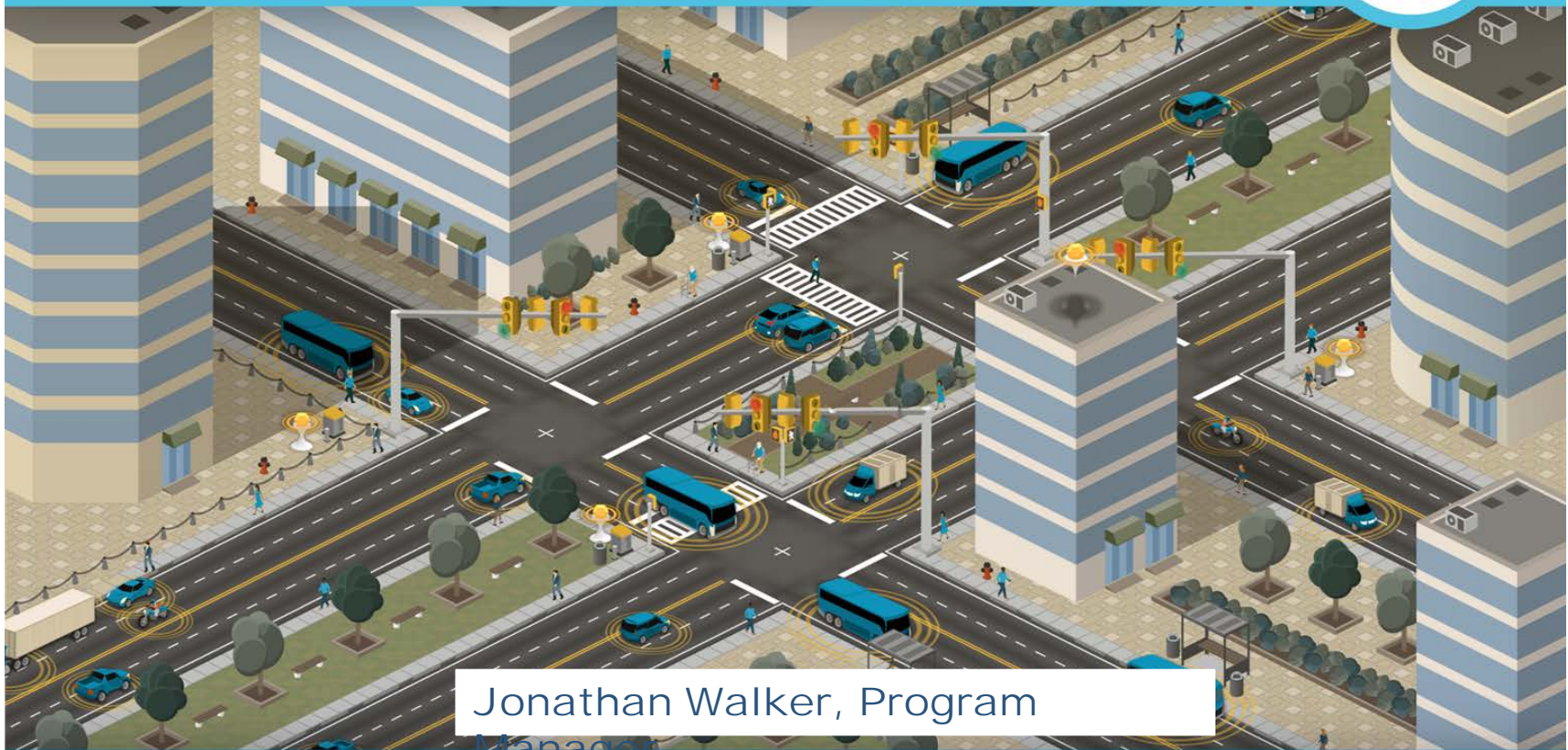# Connected Vehicle Pilot Deployment Lessons Learned

**Jonathan Walker, Program Manager**

ITS Joint Program Office

- Connected Vehicles Pilot Deployment Program Overview
  - Program goals, pilot sites, deployment schedule

- Lessons Learned in the CV Pilots Concept Development Phase
  - Deployment complexity, collaboration, and technical related

- Safety Pilot Lessons Learned Applied to CV Pilot Deployment Program
  - Participant recruitment, device installation, data collection and outreach/showcase

- How to Stay Connected

# PILOT SITES AND DEPLOYMENT SCHEDULE

- Pilot Sites

**ICF/WYDOT**

**NYCDOT**

**Tampa (THEA)**

- Overall Deployment Schedule



**Connected Vehicle Pilot Deployment (up to 50 months)**

PHASE 1 (up to 12 months) — Concept Dev. — *Progress Gate*

PHASE 2 (up to 20 months) — Design/Deploy/Test — *Progress Gate*

PHASE 3 (minimum 18 months) — Maintain/Operate Pilot — *Transition*

Routine Operations (ongoing) — Post-Pilot Operations
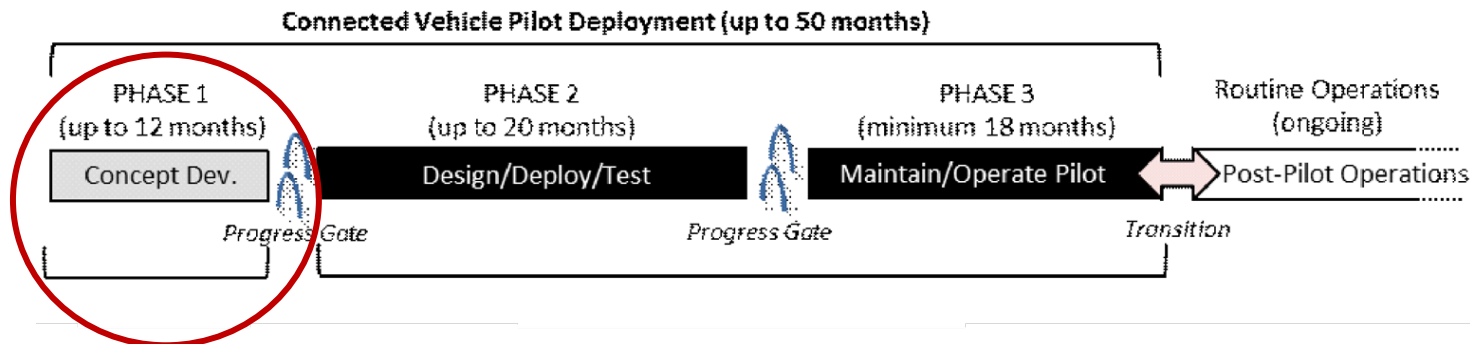
- Phase 1 – Creates the foundational plan to enable further design and deployment
- Phase 2 – Detailed design and deployment followed by testing to ensure deployment functions as intended (both technically and institutionally)
- Phase 3 – Focus is on assessing the performance of the deployed system
- Post Pilot Operations (CV tech integrated into operational practice)

# LESSONS LEARNED IN CV PILOTS CONCEPT DEVELOPMENT PHASE

# DEPLOYMENT COMPLEXITY

- Sites are eager to consume USDOT technical assistance

  - Deployments are complex, requiring a lot of diverse elements to come together in an integrated system (technical, security, privacy, performance measurement, institutional, financial, etc.)

- Concept development takes some time to conduct – prior to procuring/ designing/installing equipment

  - Sites are willing to "do the hard work now" rather than later, which would be more challenging and expensive

    - E.g., participating in detailed SyRS walkthroughs, thinking through initial application development cost estimates

  - Early discussions and information sharing regarding the Phase 2 and 3 NOFO allows agencies to investigate options for coming up with the required cost share

# COLLABORATION

- Stakeholder interaction and partnership
  - Stakeholder interaction early and often leads to better concepts and more buy-in
  - CV primes did a good job of picking partners as subs to fill out the experience required for many different activities
- Site-to-site coordination can be useful (since not set up as competitive)
  - Cooperation on security, vendor interaction, stakeholder coordination (UPS in WY and NYC)
  - Participation in virtual roundtables
- The deliverables from the sites are creating examples for others to follow
  - Meeting with folks who have already implemented CV technology was an enormously helpful and successful activity
    - E.g., Good lessons learned from SPMD on installation planning/training

# TECHNICAL RELATED

- Building in performance measurement to a deployed system requires some serious thinking in the concept development phase

- Using standards (intelligently) can help to advance sites systems engineering

- We didn't forget a key area in Phase 1 (so far), e.g., training or safety management

- Existing DMA applications made a great starting point for teams to build their ConOps around, but some will need tweaking to be implemented for real

- Building agreements with equipment suppliers is a long and uncertain activity – best to start exploring many options as soon as possible

- Gaining an early understanding of Institutional Review Board (IRB) process and timeframes can help in planning and managing schedule risk
  - E.g., considering how frequently the IRB meets in planning the project schedule

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# SAFETY PILOT LESSONS LEARNED APPLIED TO CV PILOTS

# PARTICIPANT RECRUITMENT

- Light Vehicle Drivers

  □ Understand what motivational factors are important to the community and utilize them in the recruitment process.

  □ Recruit participants iteratively to align with the planned device deployment schedule.

- Transit Vehicle Drivers

  □ Understand the number of drivers that a transit operator uses in their operations and plan for that when selecting a transit agency for deployment of applications for testing.

  □ Understand the system that the transit operator uses for matching drivers to routes, and take that into account when choosing to deploy transit applications for testing.

# DEVICE INSTALLATION

- In-Vehicle Device

  - Develop an installation plan (including device mounting) for each vehicle type and evaluate designs for any potential common elements.

  - Include "end of the line" performance testing as part of the final close-out installation tests to determine if the installation is operating as intended.

- Infrastructure-Level Device

  - Establish strong partnerships with state and local agencies responsible for the operations and maintenance of roadways and related equipment.

  - Consider deploying RSUs at sites that already have existing ITS installations to minimize costs. Having a robust fiber optic network is key to managing the volume of data collected by RSUs.

# DATA COLLECTION

- Assess the approach to data collection in the test in terms of volume and types of data that will be collected. Then develop a plan for collecting and storing the data, including the sizing of servers and any necessary data management processes.

- Allow the opportunity for the evaluator to provide a more detailed data specification document to the data collection entities as a part of the process.

- Developing a standard database structure is more cost effective to manage and analyze the data separately.

# OUTREACH AND SHOWCASE

- Outreach

    □ Determine in advance what role the USDOT and contractors will have when working with the media and incorporate language into the contracting agreements.

    □ Develop a key message that is agreed upon by all parties at onset of project. Establish clear guidelines on what information can be shared and what cannot.

- Showcase

    □ Ensure capabilities are in place early in the deployment for stakeholders to be able to experience the environment via demonstrations and showcases of the technology.

    □ Be prepared to maintain momentum throughout the project by establishing a plan to use a variety of tools to support the interests and needs of various stakeholders and audiences. Start with a prominent launch event, then follow-up with other high visibility elements.

# STAY CONNECTED

**Join us for the *Getting Ready for Deployment* Series**

- Discover more about the 2015 CV Pilot Sites
- Learn the Essential Steps to CV Deployment
- Engage in Technical Discussion

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