CONNECTED VEHICLE PILOT
Deployment Program

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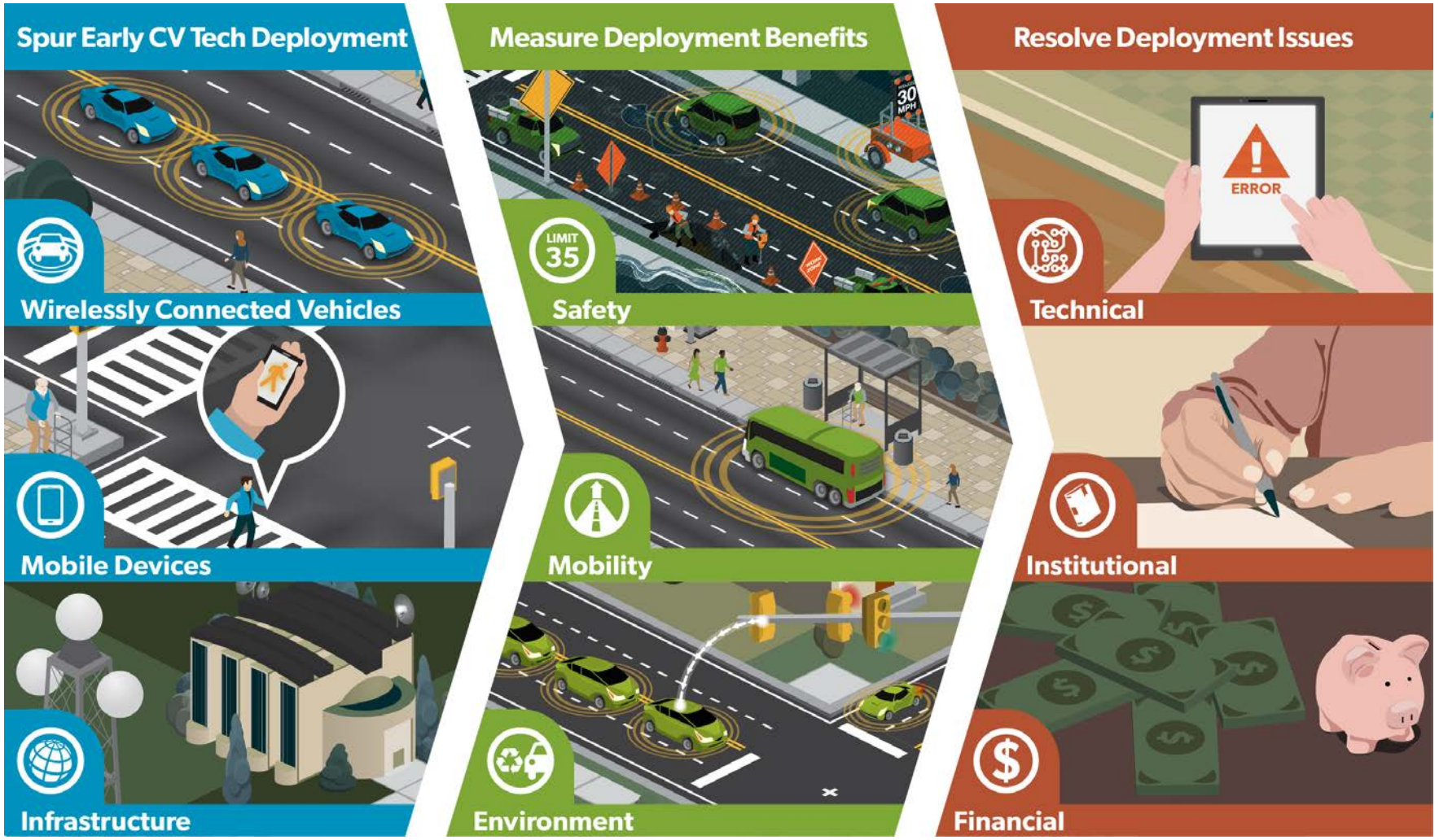
TODAY'S AGENDA

- Connected Vehicle Pilot Deployment Program Overview
- Mobile Devices, Carry-In Devices, Integrated Devices and Roadside Equipment / Units
- The USDOT Qualified Product List (QPL)
- Stakeholder Q&A

Connected Vehicle Pilot Deployment Program Overview

PROGRAM GOALS



Connected Vehicle Applications

V2I Safety

- Red Light Violation Warning
- Curve Speed Warning
- Stop Sign Gap Assist
- Spot Weather Impact Warning
- Reduced Speed/Work Zone Warning
- Pedestrian in Signalized Crosswalk Warning (Transit)

V2V Safety

- Emergency Electronic Brake Lights (EEBL)
- Forward Collision Warning (FCW)
- Intersection Movement Assist (IMA)
- Left Turn Assist (LTA)
- Blind Spot/Lane Change Warning (BSW/LCW)
- Do Not Pass Warning (DNPW)
- Vehicle Turning Right in Front of Bus Warning (Transit)

Agency Data

- Probe-based Pavement Maintenance
- Probe-enabled Traffic Monitoring
- Vehicle Classification-based Traffic Studies
- CV-enabled Turning Movement & Intersection Analysis
- CV-enabled Origin-Destination Studies
- Work Zone Traveler Information

Environment

- Eco-Approach and Departure at Signalized Intersections
- Eco-Traffic Signal Timing
- Eco-Traffic Signal Priority
- Connected Eco-Driving
- Wireless Inductive/Resonance Charging
- Eco-Lanes Management
- Eco-Speed Harmonization
- Eco-Cooperative Adaptive Cruise Control
- Eco-Traveler Information
- Eco-Ramp Metering
- Low Emissions Zone Management
- AFV Charging / Fueling Information
- Eco-Smart Parking
- Dynamic Eco-Routing (light vehicle, transit, freight)
- Eco-ICM Decision Support System

Road Weather

- Motorist Advisories and Warnings (MAW)
- Enhanced MDSS
- Vehicle Data Translator (VDT)
- Weather Response Traffic Information (WxTINFO)

Mobility

- Advanced Traveler Information System
- Intelligent Traffic Signal System (I-SIG)
- Signal Priority (transit, freight)
- Mobile Accessible Pedestrian Signal System (PED-SIG)
- Emergency Vehicle Preemption (PREEMPT)
- Dynamic Speed Harmonization (SPD-HARM)
- Queue Warning (Q-WARN)
- Cooperative Adaptive Cruise Control (CACC)
- Incident Scene Pre-Arrival Staging Guidance for Emergency Responders (RESP-STG)
- Incident Scene Work Zone Alerts for Drivers and Workers (INC-ZONE)
- Emergency Communications and Evacuation (EVAC)
- Connection Protection (T-CONNECT)
- Dynamic Transit Operations (T-DISP)
- Dynamic Ridesharing (D-RIDE)
- Freight-Specific Dynamic Travel Planning and Performance
- Drayage Optimization

Smart Roadside

- Wireless Inspection
- Smart Truck Parking

CV Pilots Deployment Schedule and Resources

- Proposed CV Pilots Deployment Schedule

Schedule Item	Date
Regional Pre-Deployment Workshop/Webinar Series	**Summer-Fall 2014**
Solicitation for Wave 1 Pilot Deployment Concepts	**Early 2015**
Wave 1 Pilot Deployments Award(s) Concept Development Phase (6-9 months) Design/Build/Test Phase (10-14 months) Operate and Maintain Phase (18 months)	**September 2015**
Solicitation for Wave 2 Pilot Deployment Concepts	**Early 2017**
Wave 2 Pilot Deployments Award(s) Concept Development Phase (6-9 months) Design/Build/Test Phase (10-14 months) Operate and Maintain Phase (18 months)	**September 2017**
Pilot Deployments Complete	**September 2020**

- Resources
  - ITS JPO Website: http://www.its.dot.gov/
  - CV Pilots Program Website: http://www.its.dot.gov/pilots

CV PILOTS WEBSITE

http://www.its.dot.gov/pilots

Research

- Safety
- Mobility
- Environment
- Road Weather
- Policy
- Connected Vehicle Technology
- CV Pilots Deployment Project
  - Pilots Deployment Project
- Short-Term, Intermodal Research
- Exploratory Research
- ITS Cross-Cutting Support
- Success Stories

Connected Vehicles

CV Pilots Deployment Project

Latest News & Updates

- Sample Deployment concept audio recordings for District 13 Operations is now available (9/23/14)
- Sample Deployment concept audio recordings for Greypool County is now available (9/22/14)
- Deployment concept audio recordings for Downtown Sunnyside and H.W. Halleck Expressway are now available (9/18/14)
- CV Pilots FAQs (Updated September 16, 2014)
- Webinar Part 1 recording is now available - August 27, 2014 - Webinar Series Part 1: Concept, Phases, Waves, and Partnerships (9/4/14)
- The USDOT Connected Vehicles Pilot Deployment Program Webinar Series Part 2: Communications and Role of DSRC is open for registration
- The presentation material of the USDOT Connected Vehicles Pilot Deployment Program Webinar Series Part 1 is available now
- The Descriptions of the Connected Vehicle Applications are available now
- Summary of Responses to the Connected Vehicle Pilot Deployment Program's Request for Information (RFI)

More news »

About the CV Pilots Deployment Project

The U.S. DOT (DOT) connected vehicle research program is a multimodal initiative that aims to enable safe, interoperable networked wireless communications among vehicles, infrastructure, and personal communications devices. Connected vehicle research is sponsored by the DOT and others to leverage the potentially transformative capabilities of wireless technology to make surface transportation safer, smarter, and greener. Research has resulted in a considerable body of work supporting pilot deployments, including concepts of operations and prototyping for more than two dozen applications. Concurrent Federal research efforts developed critical cross-cutting technologies and other enabling capabilities required to integrate and deploy applications.

Based on the successful results of the connected vehicle research program, and the recent decision by NHTSA to pursue vehicle to vehicle communications safety technology for light vehicles, a robust connected vehicle pilots program is envisioned as a mechanism to spur the implementation of connected vehicle technology. These pilots will serve as initial implementations of connected vehicle

CV Pilots Portal

- CV Pilots FAQs
- CV Applications
- Deployment Concepts

Featured Links

- Active Transportation and Demand Management (ATDM
- Connected Vehicle Reference Implementation Architecture (CVRIA) and SET-IT
- Connected Vehicle Test Beds
- Open Source Application Development Portal (OSADP)
- Research Data Exchange (RDE)
- Safety Pilot
- Vehicle-to-Infrastructure (V2I) Prototype
- ITS Professional Capacity Building Program (PCB)

Research Contact

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Devices Potentially Deployed as a Part of CV Pilots

Types and Definitions of Devices

- **In-Car Devices**
  - Carry-in devices: portable devices potentially brought in and connected to vehicles but not generally utilized outside of vehicles
  - Mobile devices: portable devices with built-in communications capabilities, such as smart phones, can be used outside vehicles and may or may not necessarily be connected to vehicles
  - Integrated devices: devices built into vehicles, not portable, including aftermarket/retrofit integrated devices and OEM integrated devices


Mobile Device


Carry-in Device

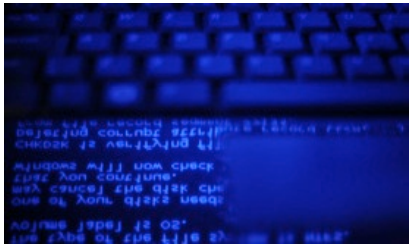

Integrated Device

- **Roadside Equipment**
  - The Connected Vehicle roadside devices that are used to send messages to, and receive messages from, nearby vehicles

CV Pilot Deployment Requirements

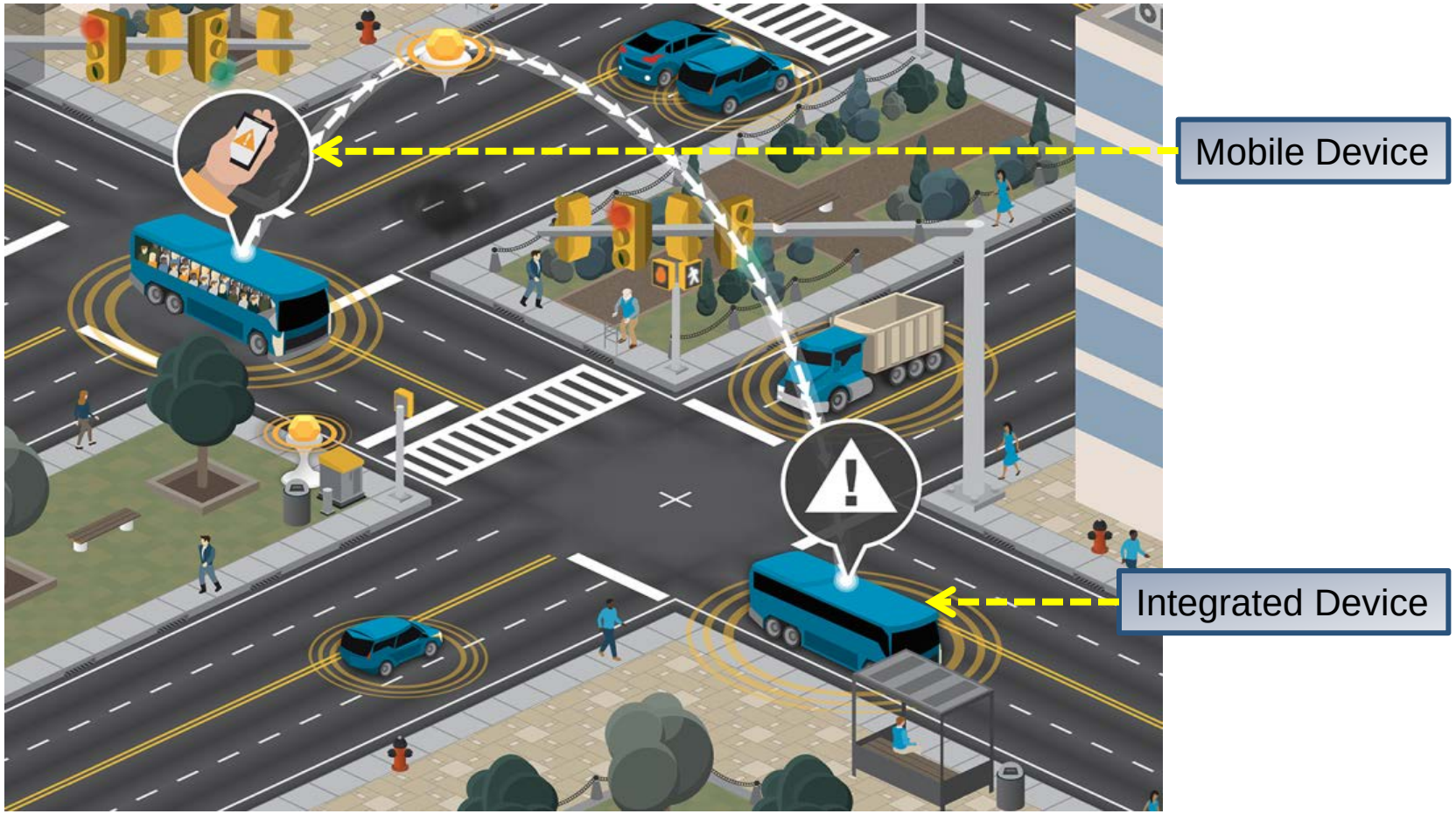
- **In-Car Devices**
  - Integrated or carry-in devices for connected vehicles capable of generating an SAE J2735 Basic Safety Message (BSM)
- **Roadside Units (RSU)**
  - The USDOT is currently examining equipment from multiple vendors. V4.0 is recommended but V3 is also acceptable.
  - Once it is confirmed that the devices meet the latest (V4) specification, we expect to make this list available to stakeholders.

- **Security**
  - Security Credential Management System (SCMS) is required for Safety Applications
- **Privacy**
  - Users cannot be tracked along their journey or identified without appropriate authorization



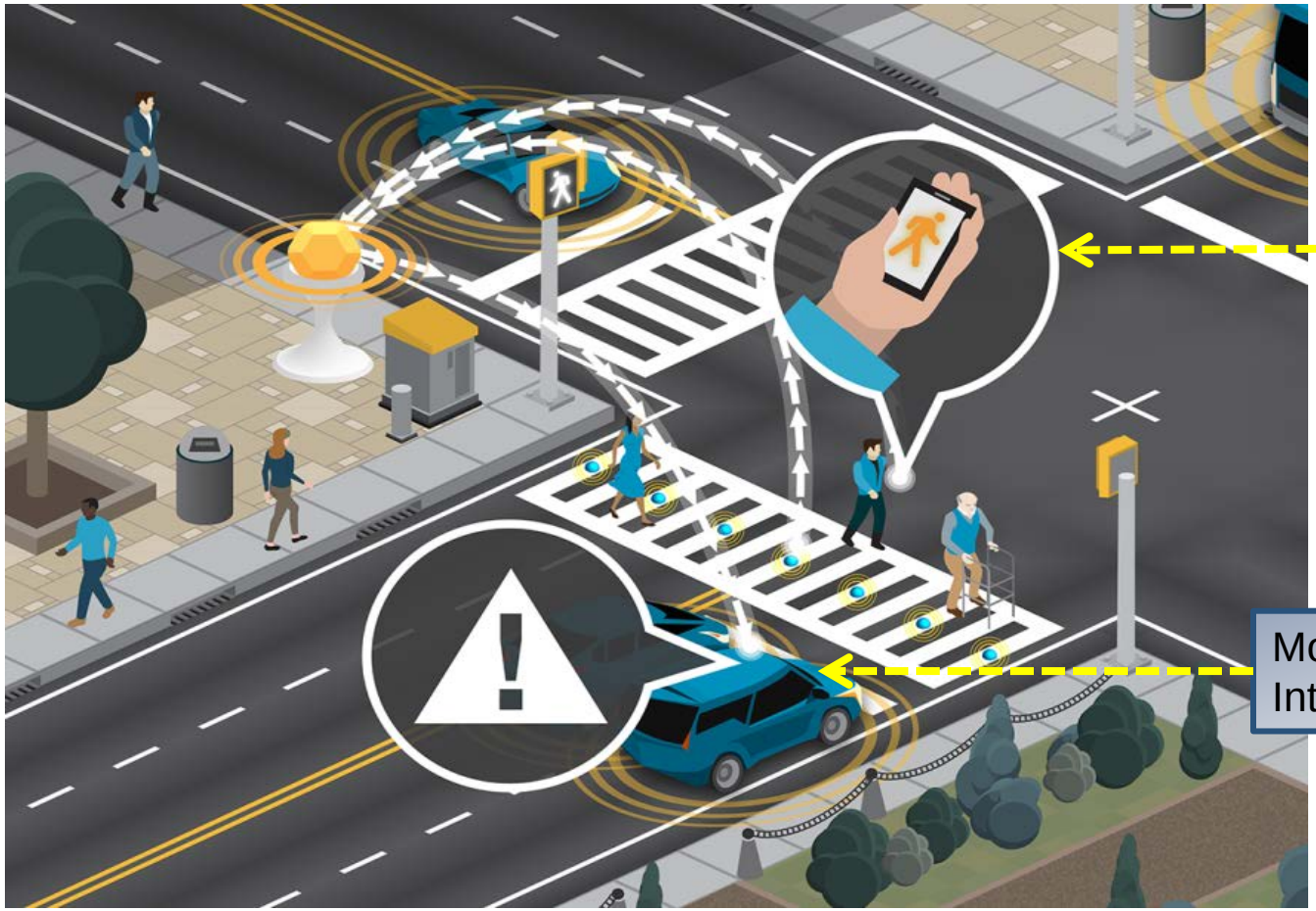
UTILIZATION OF DEVICES ON APPLICATIONS
URBAN SUNNYSIDE SCENARIOS – 1

- Mobile and Integrated Devices on Mobility Applications
  - Connection Protection (T-CONNECT) Application



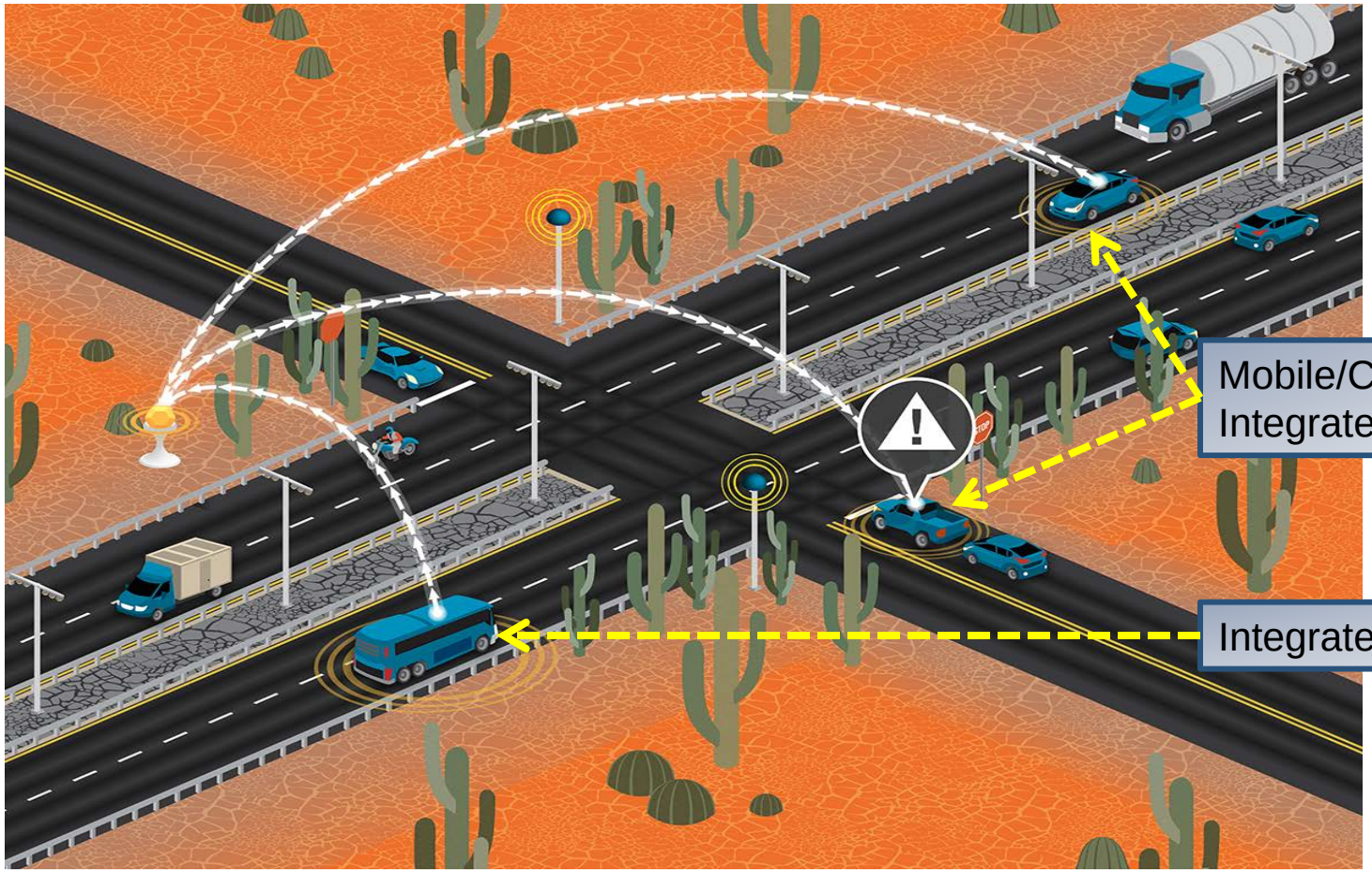
UTILIZATION OF DEVICES ON APPLICATIONS
URBAN SUNNYSIDE SCENARIOS – 2

- Mobile/Carry-in/Integrated Devices on Safety Applications
  - Pedestrian in Signalized Crosswalk Warning



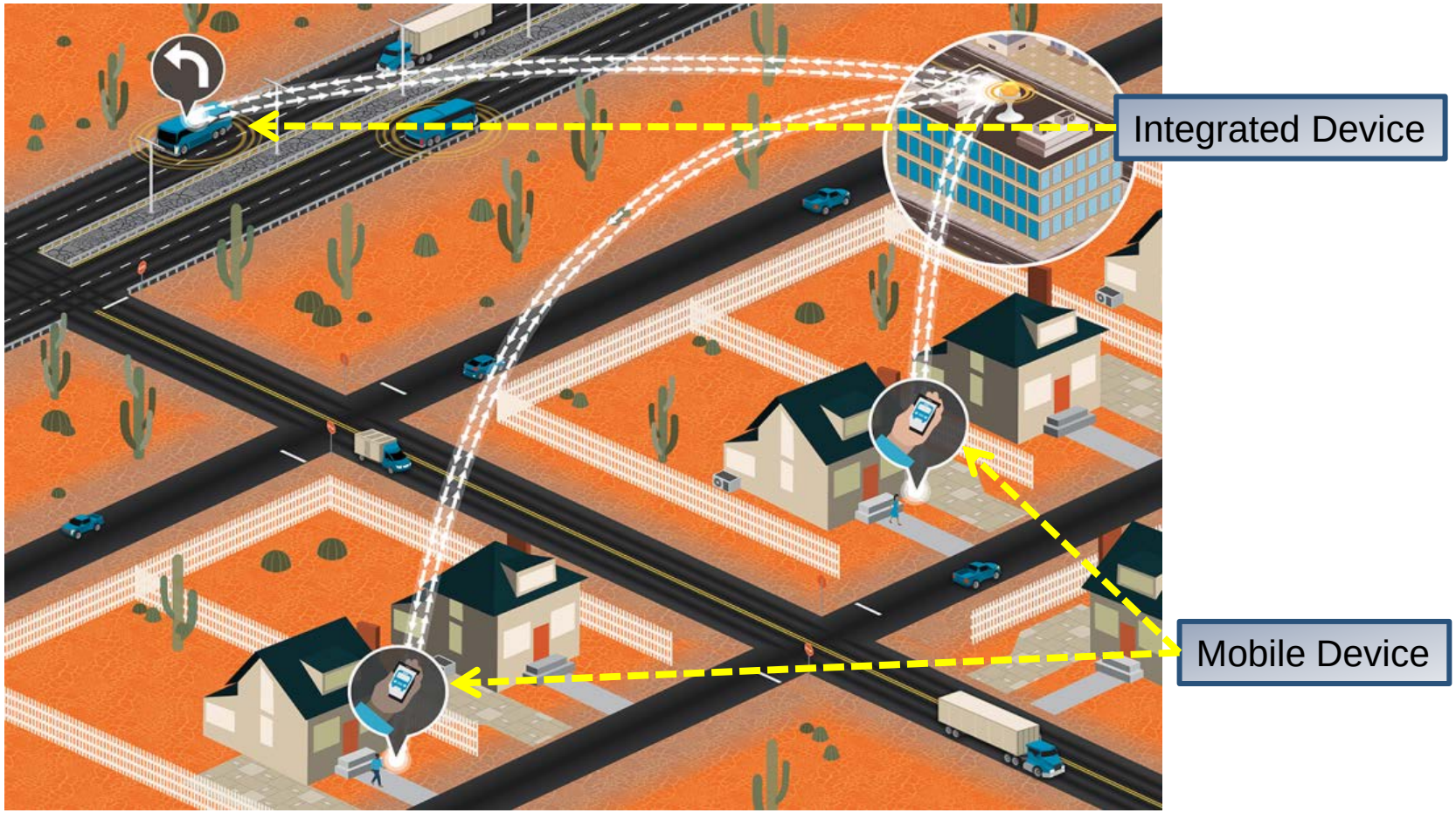
Utilization of Devices on Applications
Greypool County Scenarios – 1

- Mobile/Carry-in/Integrated Devices on Safety Applications
  - Stop Sign Gap Assist



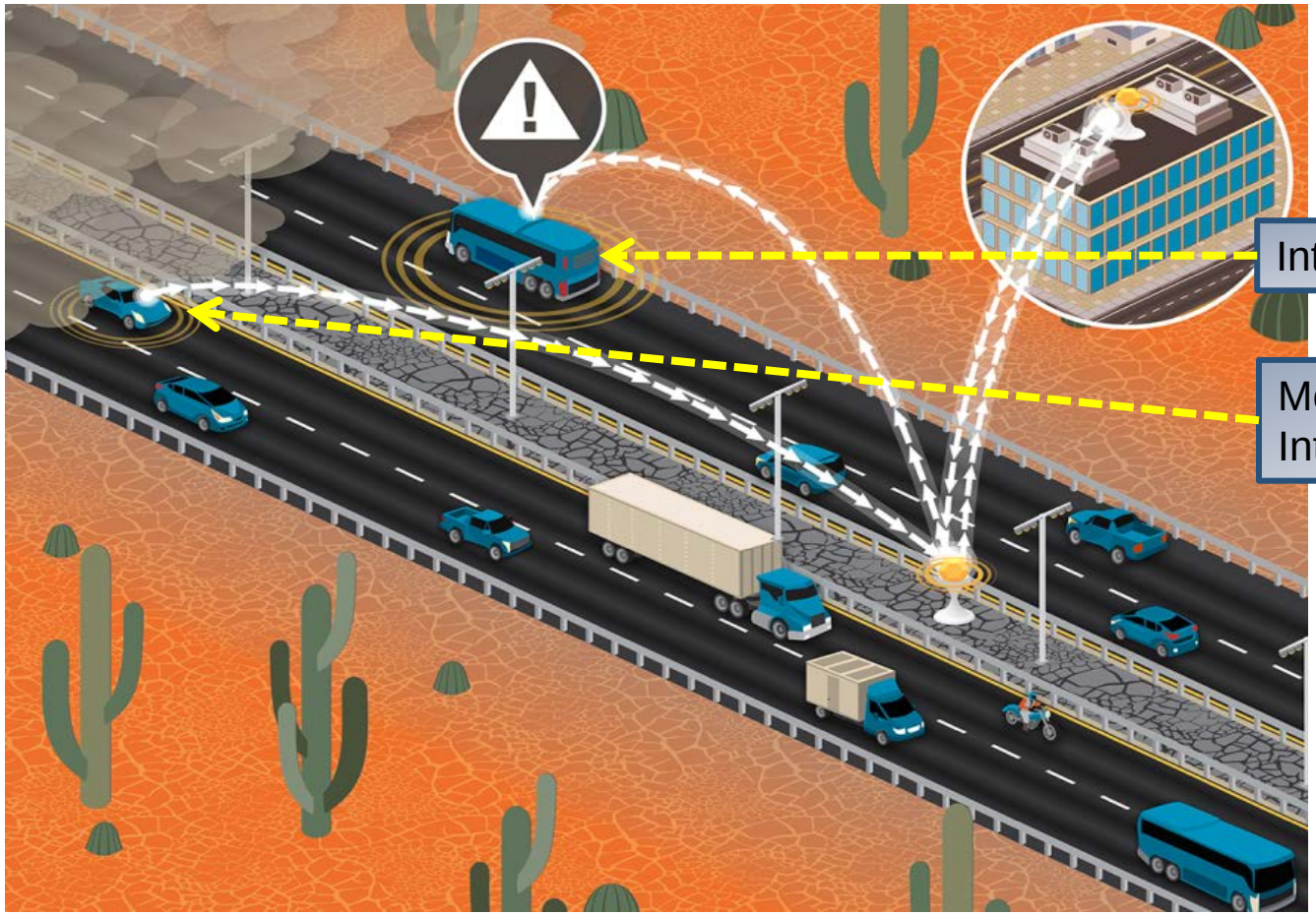
Utilization of Devices on Applications
Greypool County Scenarios – 2

- Mobile/Carry-in/Integrated Devices on Mobility Applications
  - Dynamic Transit Operations (T-DISP)



Utilization of Devices on Applications
Greypool County Scenarios – 3

- Mobile/Carry-in/Integrated Devices on Mobility Applications
  - Weather Response Traffic Information (WxTINFO)



KEY FINDINGS AT THE CV PILOTS WORKSHOP

- **Challenges:**
  - Driver distraction with any/all in-vehicle devices – need to be integrated
  - Text to speech/voice recognition is important
  - For safety applications – Mobile and carry-in devices are more difficult
  - Carry-in devices will fade away

- **Most Appropriate Role:**
  - Smart phone can be gateway to making any vehicle a connected vehicle
  - Vehicle can act as probes and give drivers information to make smart decisions

Discussions on the USDOT Qualified Product List

US DOT Guidelines & Certifications

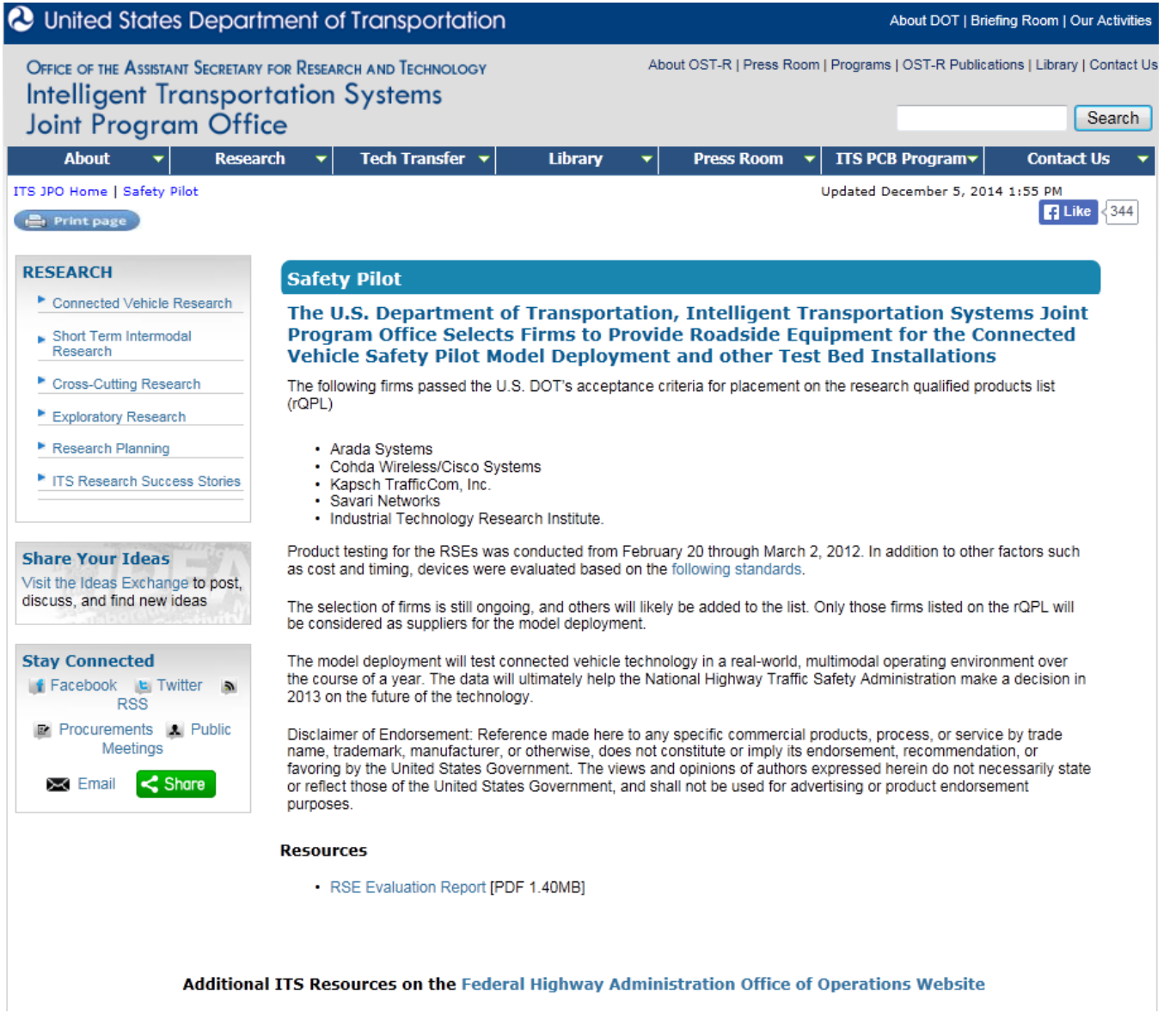
- **FHWA Guidelines**
  - Currently under development
  - Scheduled to be released in Summer / Fall 2015

- **RSU Specifications**
  - http://www.its.dot.gov/safety_pilot/pdf/T-10001-T2-05_RSE_Device_Design_Specification_v30.pdf
  - http://www.its.dot.gov/testbed/PDF/USDOT_RSUSpecification4%200_Final.pdf

- **Certification**
  - USDOT intends to enter into a Cooperative Agreement with one or more facilities for certification
  - Four layer approach to certification

SAFETY PILOTS QUALIFIED PRODUCTS LIST

- http://www.its.dot.gov/safety_pilot/safety_pilot_qpl.htm



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- Short Term Intermodal Research
- Cross-Cutting Research
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Safety Pilot

The U.S. Department of Transportation, Intelligent Transportation Systems Joint Program Office Selects Firms to Provide Roadside Equipment for the Connected Vehicle Safety Pilot Model Deployment and other Test Bed Installations

The following firms passed the U.S. DOT's acceptance criteria for placement on the research qualified products list (rQPL)

- Arada Systems
- Cohda Wireless/Cisco Systems
- Kapsch TrafficCom, Inc.
- Savari Networks
- Industrial Technology Research Institute.

Product testing for the RSEs was conducted from February 20 through March 2, 2012. In addition to other factors such as cost and timing, devices were evaluated based on the following standards.

The selection of firms is still ongoing, and others will likely be added to the list. Only those firms listed on the rQPL will be considered as suppliers for the model deployment.

The model deployment will test connected vehicle technology in a real-world, multimodal operating environment over the course of a year. The data will ultimately help the National Highway Traffic Safety Administration make a decision in 2013 on the future of the technology.

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Resources

- RSE Evaluation Report [PDF 1.40MB]

Additional ITS Resources on the Federal Highway Administration Office of Operations Website

UPCOMING EVENTS

- **Connected Vehicle Test Bed - Virtual PlugFest**
  - Every Wednesday from 11 AM to 2 PM (EST)
  - For details: http://www.its.dot.gov/testbed/testbed_affiliated.htm

- **Next CV Pilot Webinar**
  - Early January 2015 (January 7 – 9)

- **Solicitation for Wave 1 Pilot Deployment Concepts**
  - Early 2015

Stakeholder Q&A