Intelligent Transportation System Strategic Plan 2015-2019

http://its.dot.gov/strategicplan/index.html
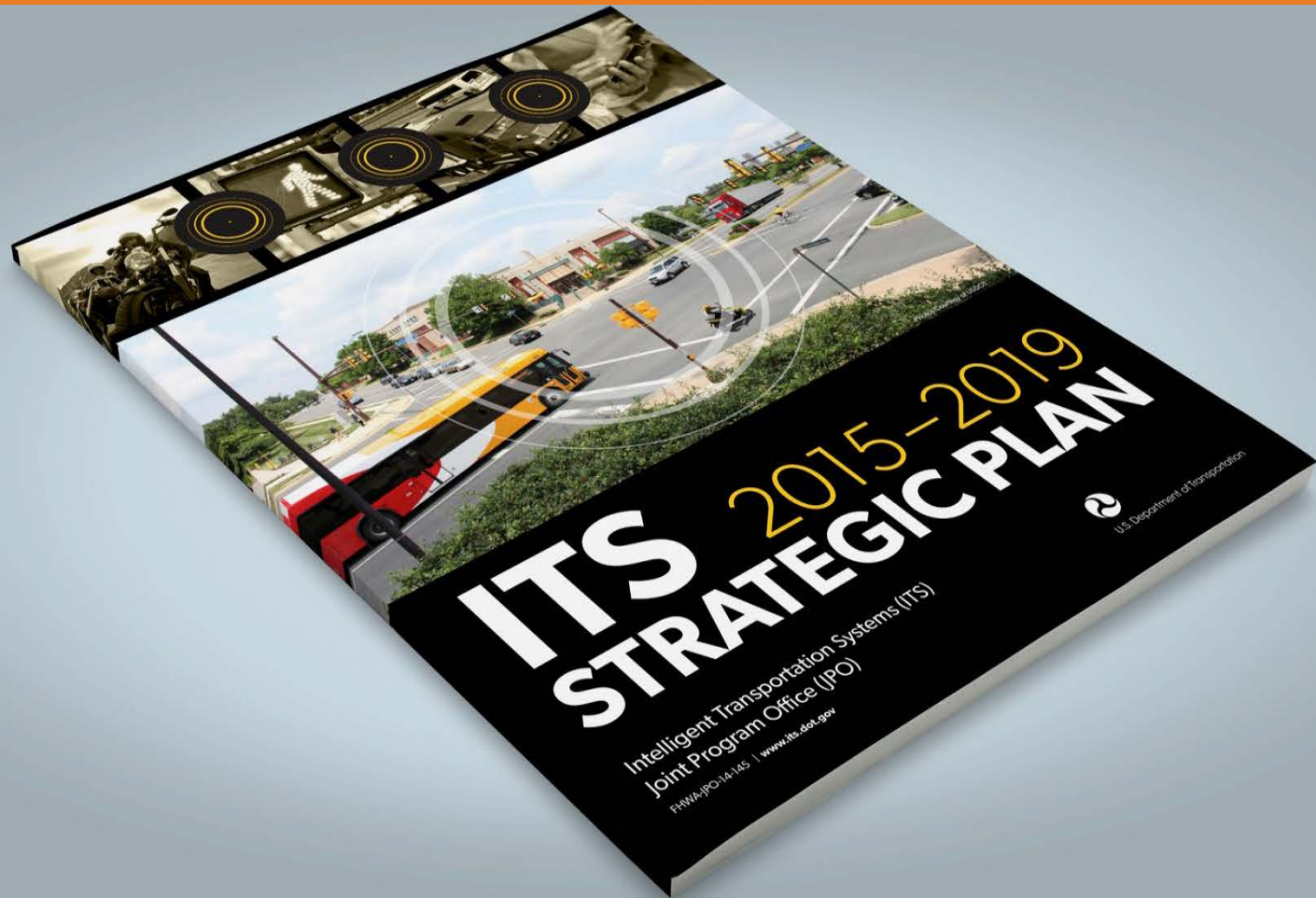
Intelligent Transportation Systems Strategic Plan 2015 - 2019

ITS Deployment Opportunity Planning Discussion and Wrap Up

Egan Smith

Introductions/Why Are You Here Today?

- What is your role related to connected vehicles?

- What are you most interested in learning more about?

- What questions do you have that you are hoping to get answered during this session?

- Do you know what your organization is currently doing related to connected vehicles?

- We want you to leave this workshop with an understanding of what you need to be ready to deploy a connected vehicles environment and what the funding path forward looks like to get there.

The Planning Process

- Where do we/you want to go?

- How are we/you going to get there?

- What will it take?

- How did we do?

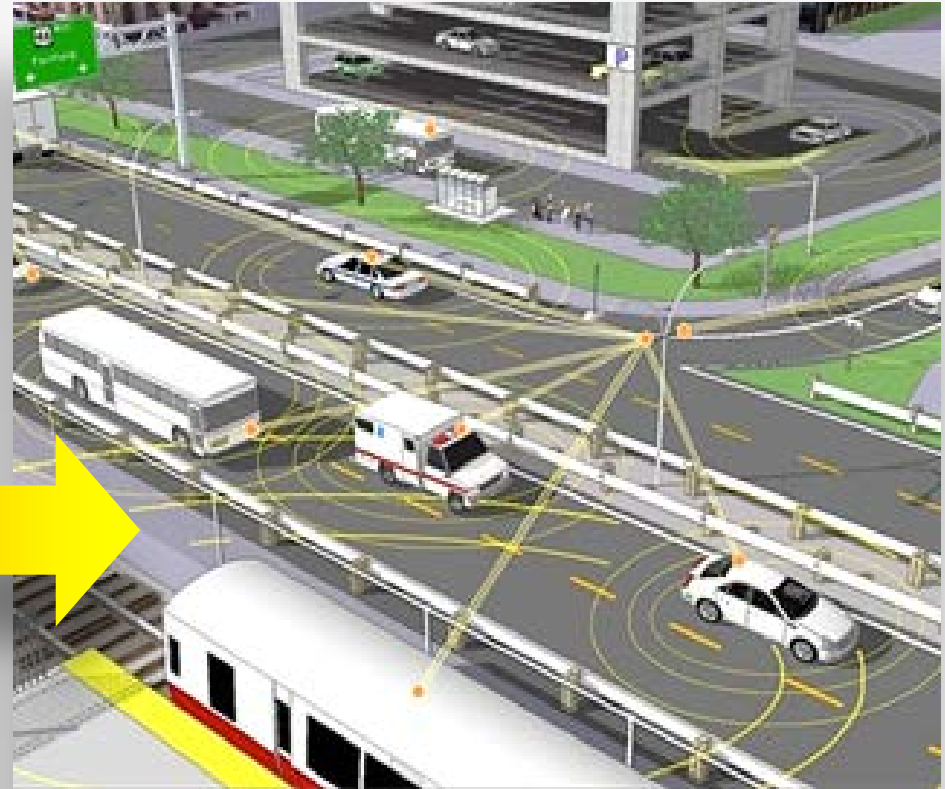# Where do we/you want to go?

ITS Joint Program Office

...Where do we/you want to go?

- Today (Not Connected)
- Future CV Environment

Internal Stakeholders
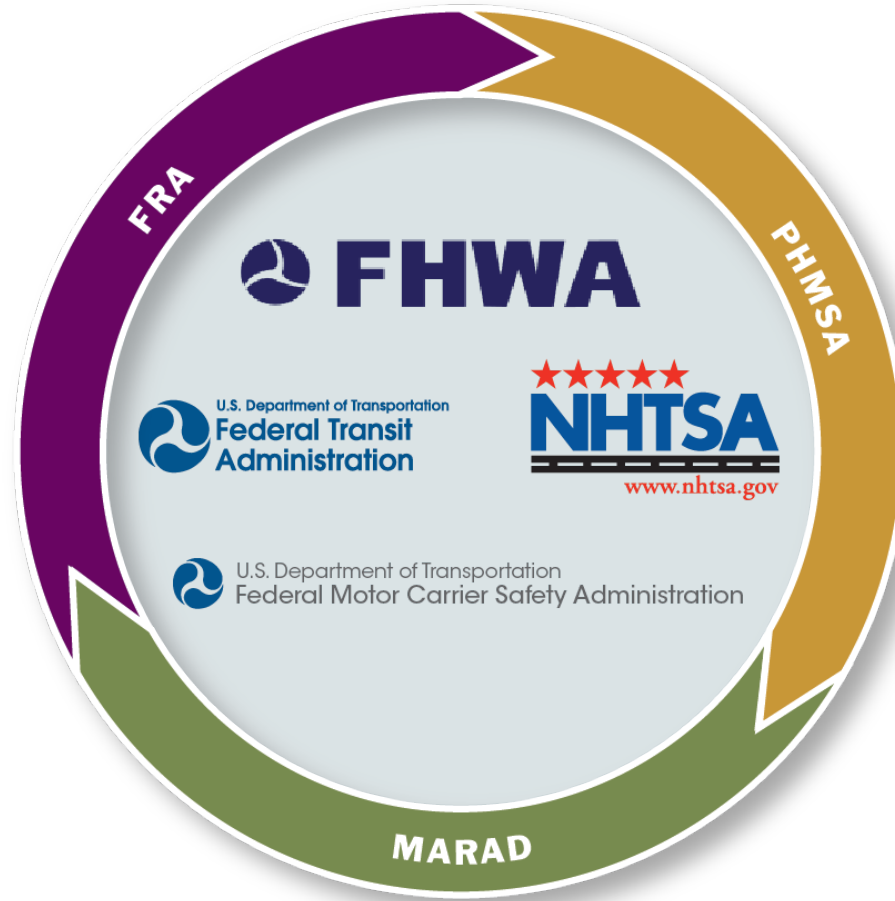
External Stakeholders

How are we/you going to get there?

ITS Joint Program Office

Key ITS Policy Program Focus Areas

I. SECURITY POLICY

II. COMMUNICATIONS POLICY

III. DATA POLICY

IV. INTEROPERABILITY POLICY

V. DEPLOYMENT STRATEGIES and DEPLOYMENT READINESS

VI. FEDERAL ROLE IN POLICY

Security Credential Management System

- **Definition** A system to ensure the trusted communications between mobile devices and other mobile devices and/or roadside devices and back offices, and protect the confidentiality and integrity of data as it moves through a variety of media.

- **CV Pilots Requirements** Develop a security management operating concept to describe the underlying needs of the pilot deployment to ensure secure operations, and outline a concept that addresses these needs.

- **USDOT's Role on SCMS** USDOT will provide a prototype national-level SCMS system. The security management operating concept must include an interface with this capability.

Security Credential Management System
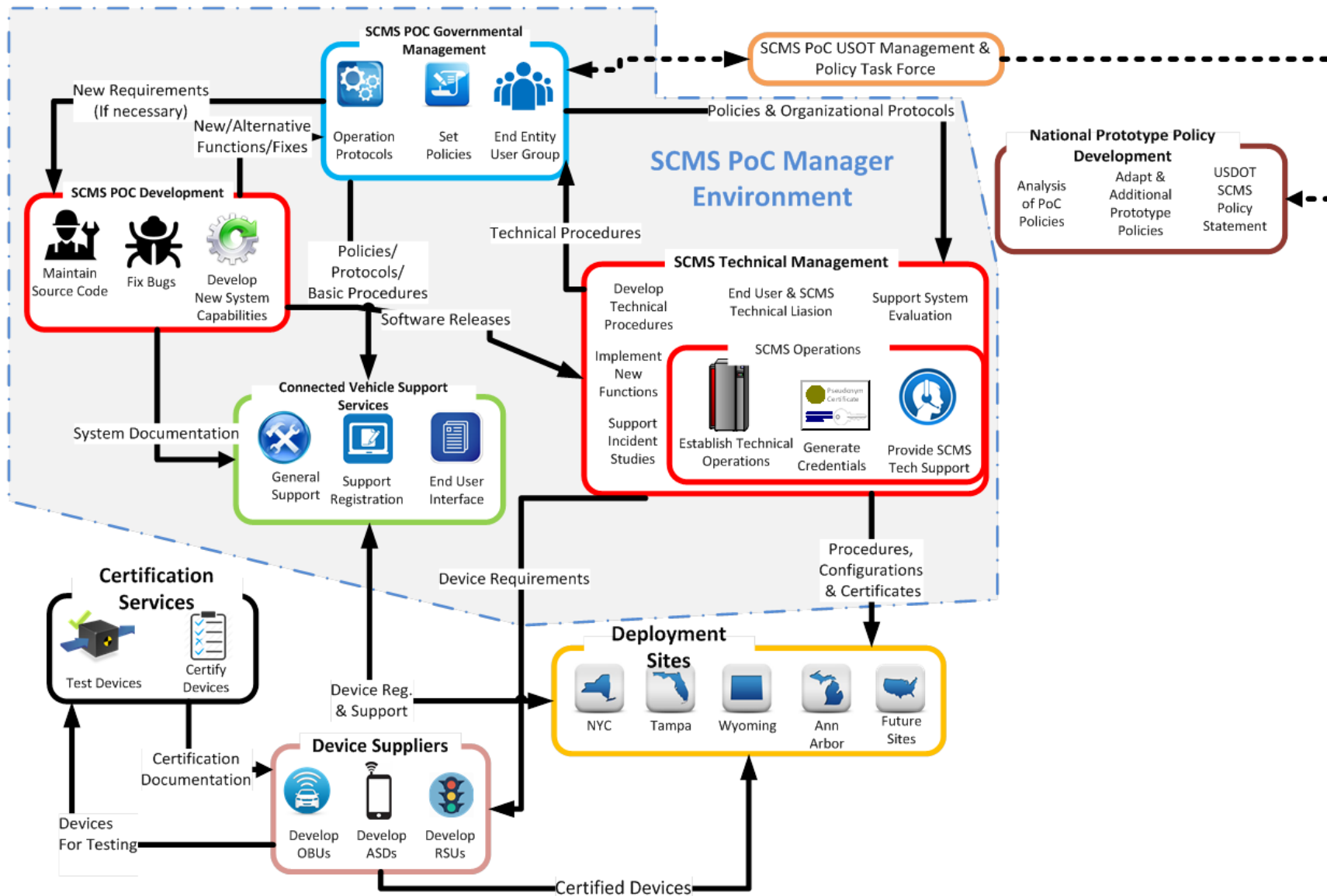
Certification

- Vision is to help the industry to organize and run self-sustaining certification program supporting deployment of DSRC-based services

Architecture, Standards & International Harmonization

- **Program Description** – **Architecture** provides a framework to guide planning and interoperable deployment of ITS (incl. connected vehicle) and identifies interfaces for standardization. **Standards** define interfaces with architectures to enable required interoperability and support efficient, non-proprietary ITS deployment. **International Harmonization** seeks to leverage global resources and expertise to (1) maximize commonality of ITS deployments, (2) share labor resources and (3) access best-available expertise in order to facilitate ITS deployment and open markets.

- **Program Goals** – Enable efficient, interoperable and cost-effective ITS infrastructure, connected vehicle and automated vehicle deployments across North America.

Guidance and Rulemaking

I. V2V Rulemaking

II. V2I Guidance

III. Other Rulemaking and Guidance (What? / Why?)

Safety Pilot Model Deployment Program

- 73 miles of instrumented roadway with 27 roadside units in Ann Arbor, MI

- Over 2,800 vehicles equipped with a variety of device types

- Various V2V and V2I applications

- Testing of prototype security mechanisms and device certification processes

- 1 year of data collection to support 2013 NHTSA decision

- Transitioned to an operational environment

- Pilot Sites

ICF/WYDOT

NYCDOT

Tampa (THEA)

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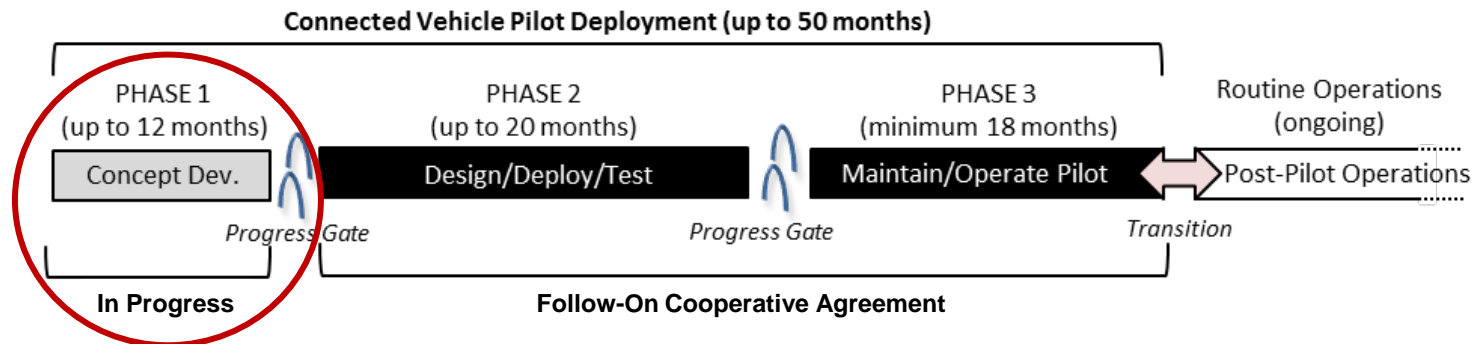
- □ Phase 1 – Creates the foundational plan to enable further design and deployment
- □ Phase 2 – Detailed design and deployment followed by testing to ensure deployment functions as intended (both technically and institutionally)
- □ Phase 3 – Focus is on assessing the performance of the deployed system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

How Can This Approach Help You to Achieve a Successful CV Deployment?

- **Successful deployment begins with disciplined Concept Development and System Planning**
  - To mitigate technical, institutional, and financial risk
  - To design and deploy on schedule and within budget
  - To routinely assess safety, mobility and environmental impacts
  - To create long-term technical and financial sustainability

- **Leverage Material from the CV Pilots (on-line)**
  - Tasks and deliverables
  - Guidance and technical assistance material (e.g., on-line webinars)
  - Examples from 3 Pilot Sites
  - Available @ http://www.its.dot.gov/pilots/index.htm

Details on Deployment Planning

- Deployment Planning/Project Management Approach
- Concept of Operations
- Security and Privacy
- Safety Management
- Performance Measurement
- System Requirements
- Application Deployment Plan
- Participant Training/Stakeholder Education
- Partnership Coordination/Finalization
- Deployment Outreach Planning
- Comprehensive Deployment Plan

Deployment Planning Process

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┌─────────────────┐   ┌─────────────────┐   ┌─────────────────┐   ┌─────────────────┐
│   Deployment    │   │    Concept      │   │     System      │   │  Comprehensive  │
│    Planning     │   │  Development    │   │  Requirements   │   │   Deployment    │
│    Approach     │   │                 │   │                 │   │      Plan       │
└─────────────────┘   └─────────────────┘   └─────────────────┘   └─────────────────┘
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Deployment Planning Approach	Concept of Operations	System Requirements	Comprehensive Deployment Plan
	Security Management	Application Deployment	
	Safety Management	Participant Training & Stakeholder Education	
	Performance Measurement	Partnership Coordination	
		Outreach	

What will it take?

Funding for ITS Deployment

- General eligibility
  - CV deployments are eligible for Federal aid funding where eligibility for ITS investments have been previously established

| National Highway Performance Program |
| Surface Transportation Block Grant Program |
| *Transportation Alternatives Set-aside* |
| *Recreational Trails Program Set-aside* |
| *Surface Transportation Block Grant Program (net of TA & Rec Trails)* |
| Congestion Mitigation & Air Quality Improvement |
| Highway Safety Improvement Program |
| Railway-Highway Crossings Program |
| Metropolitan Planning |
| National Highway Freight Program |

Funding for ITS Deployment (cont.)

- **Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Grants:** $60M <u>annually</u> in competitive grants <u>between 2016 and 2020</u> for the development of model deployment sites for large scale installation and operation of advanced transportation technologies to improve safety, efficiency, system performance, and infrastructure return on investment. http://www.grants.gov/custom/viewOppDetails.jsp?oppId=282433

- **Mobility on Demand (MOD) Sandbox:** Provides a venue through which integrated MOD concepts and solutions are demonstrated in real-world settings. FTA seeks to fund $8M for project teams to innovate, explore partnerships, develop new business models, integrate transit and MOD solutions, and investigate new, enabling technical capabilities. **Proposals Due: 7/5/16** https://www.transit.dot.gov/research-innovation/mobility-demand-mod-sandbox-program

U.S. DOT and Commerce Discretionary Grant Programs

Transportation Investment Generating Economic Recovery (TIGER)

- Application Deadline: April 29, 2016

University Transportation Center (UTC)

- Application Deadline: May 13, 2016

FTA – Buses and Bus Facilities & Low or No Emission

- Application Deadline: May 13, 2016

U.S. DOT and Commerce Grant Programs (continued)

FTA – Tribal Transit Program

- Application Deadline: May 13, 2016

FRA – Railroad Safety Technology for Positive Train Control (PTC)

- Application Deadline: May 19, 2016

FHWA – Surface Transportation System Funding Alternatives (SFTSA) Program

- Application Deadline: May 20, 2016

U.S. DOT and Commerce Grant Programs (continued)

FTA – Enhanced Mobility/Rides to Wellness/Innovative Coordinated Access

- Application Deadline: May 31, 2016

FTA – Mobility on Demand

Application Deadline: July 5. 2016

EDA – Regional Innovation Strategies (RIS) Program

- Application Deadline: June 25, 2016

Keys to the Federal-Aid Program – Through the Planning Process

The Planning Rule

- On Friday, May 27, 2016, the U.S. Department of Transportation's (USDOT) Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) published the Final Rule on Statewide and Nonmetropolitan Transportation Planning and Metropolitan Transportation Planning in the Federal Register.

- This rule implements the changes to the planning process established by the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation Act (FAST Act).

- The Notice of Proposed Rulemaking (NPRM) was published in the Federal Register on June 2, 2014.

The Planning Rule (continued)

The final rule on Statewide and Nonmetropolitan Transportation Planning and Metropolitan Transportation Planning, published May 27, implements certain planning and environmental provisions of MAP-21 and the FAST Act changes to the transportation planning process, including:

- **requiring a performance-based approach to planning**
- a new emphasis on the nonmetropolitan transportation planning process, by requiring States to have a higher level of involvement with nonmetropolitan local officials and providing a process for the creation of regional transportation planning organizations
- adding a structural change to the membership of large metropolitan planning organizations (MPOs) to include representation of transit providers
- **adding a framework for voluntary scenario planning**
- implementing new authority for integrating the planning and environmental review processes as well as programmatic mitigation plans

The Planning Rule (continued)

- MAP-21 transformed the Federal-aid program by establishing new requirements for performance management and performance based planning and programming to ensure the most efficient investment of Federal transportation funds.

- The FAST Act continued the performance management and performance based planning and programming requirements of MAP-21 with minor changes.

- Performance management and performance based planning and programming increases the accountability and transparency of the Federal-aid program and provides for a framework to support improved investment decision making through a focus on performance outcomes for key national transportation goals.

- The State DOTs and MPOs are expected to use the updated regulations to make better informed transportation planning and programming decisions.

- The new performance aspects of the Federal-aid program would allow FHWA and FTA to better communicate a national performance story and more reliably assess the impacts of Federal funding investments.

Potential Benefits of ITS – Key Solution

- **Safety**. The injuries and fatalities of both vehicle occupants and vulnerable road users will be reduced and mitigated.

- **Mobility**. The information about travel conditions and options for both system users and operators will be increased and improved.

- **Environment**. The impact of vehicle travel will be reduced by promoting greener transportation choices and driver/vehicle behavior.

- **Data**. New and cost-effective data sources and collection methods will be introduced that will improve asset management, network operations, just-in-time maintenance, and incident response, among other functions

Benefits are expected to grow over time as more vehicles, infrastructure and travelers are equipped

Typical Planning Products and Processes

- **Long-range visioning**

- **Metropolitan Transportation Plan Statewide/regional long-range transportation plan**

- **Transportation Improvement Program**

- **Short-range transportation plan**

- **Congestion management plan**

- **Asset management plan**

- **ITS and operations plan**

- **ITS Architecture**

- **State implementation plan**

- **Strategic Highway Safety Plan**

- **Highway Safety Improvement Program**

- **Transit development plan**

- **Transportation demand management plan**

- **Non-motorized (bicycle and pedestrian) plan**

- **Corridor studies (modal or multimodal)**

- **Public involvement plan**

- **Freight plans**

- **Financing plans**

Metropolitan Transportation Plan (MTP) Statewide/Regional Long-Range Transportation Plan

- Both States and MPOs develop long-range transportation plans (LRTPs)
- MTPs guide decision-making and investments across all modes of surface transportation over a 20+ year horizon
- During this 20+ year horizon, emerging CV technology may revolutionize transportation, making it important that MTPs start including plans for the infrastructure, data, etc. that regions will need to support CV
- CV will also provide more comprehensive, more granular, and (in some cases) more reliable data to track performance measures in the performance-based MTP

NPRM to Propose National Performance Management Measures

- On Friday, April 22, the Federal Highway Administration (FHWA) published in the Federal Register a Notice of Proposed Rulemaking (NPRM) to propose national performance management measure regulations to assess the performance of the National Highway System, Freight Movement on the Interstate System, and the Congestion Mitigation and Air Quality Improvement Program, as required by the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation Act ("FAST Act").

NPRM to Propose National Performance Management Measures

This NPRM proposes regulations that would make progress towards the following national goals:

- Congestion reduction - To achieve a significant reduction in congestion on the NHS.

- System reliability - To improve the efficiency of the surface transportation system.

- Freight movement and economic vitality - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.

- Environmental sustainability - To enhance the performance of the transportation system while protecting and enhancing the natural environment.

In addition, this NPRM:

- Provides for greater consistency in the reporting of condition/performance;

- Proposes requirements for the establishment of targets that can be aggregated at the national level;

- Proposes reporting in a consistent manner on progress achievement; and

- Proposes a process for determining a State DOT's significant progress.

How did we do?

Lessons Learned in CV Pilots Concept Development Phase

- Stakeholder interaction early and often leads to better concepts and more buy-in
- 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.)
- 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
- Building in performance measurement to a deployed system requires some serious thinking in the concept development phase
- We didn't forget a key area in Phase 1 (so far), e.g., training or safety management
- The deliverables from the sites are creating examples for others to follow
  - E.g., good lessons learned from Safety Pilot Model Demonstration (SPMD) on installation planning/training
- Concept development takes some time to conduct – prior to procuring/ designing/installing equipment
- Using standards (intelligently) can help to advance sites systems engineering

Planning Stakeholders

PERFORMANCE MEASUREMENT & EVALUATION

- **Performance Measurement**
  - Means of assessing the progress made towards attaining established goals
  - Not just about data collection, verification, and cleaning but also about using the data to understand the system

- **Performance Monitoring**
  - Ongoing tracking of performance to assess if targets have been or likely to be met
  - Enables system managers to take corrective and proactive actions to control and manage the system
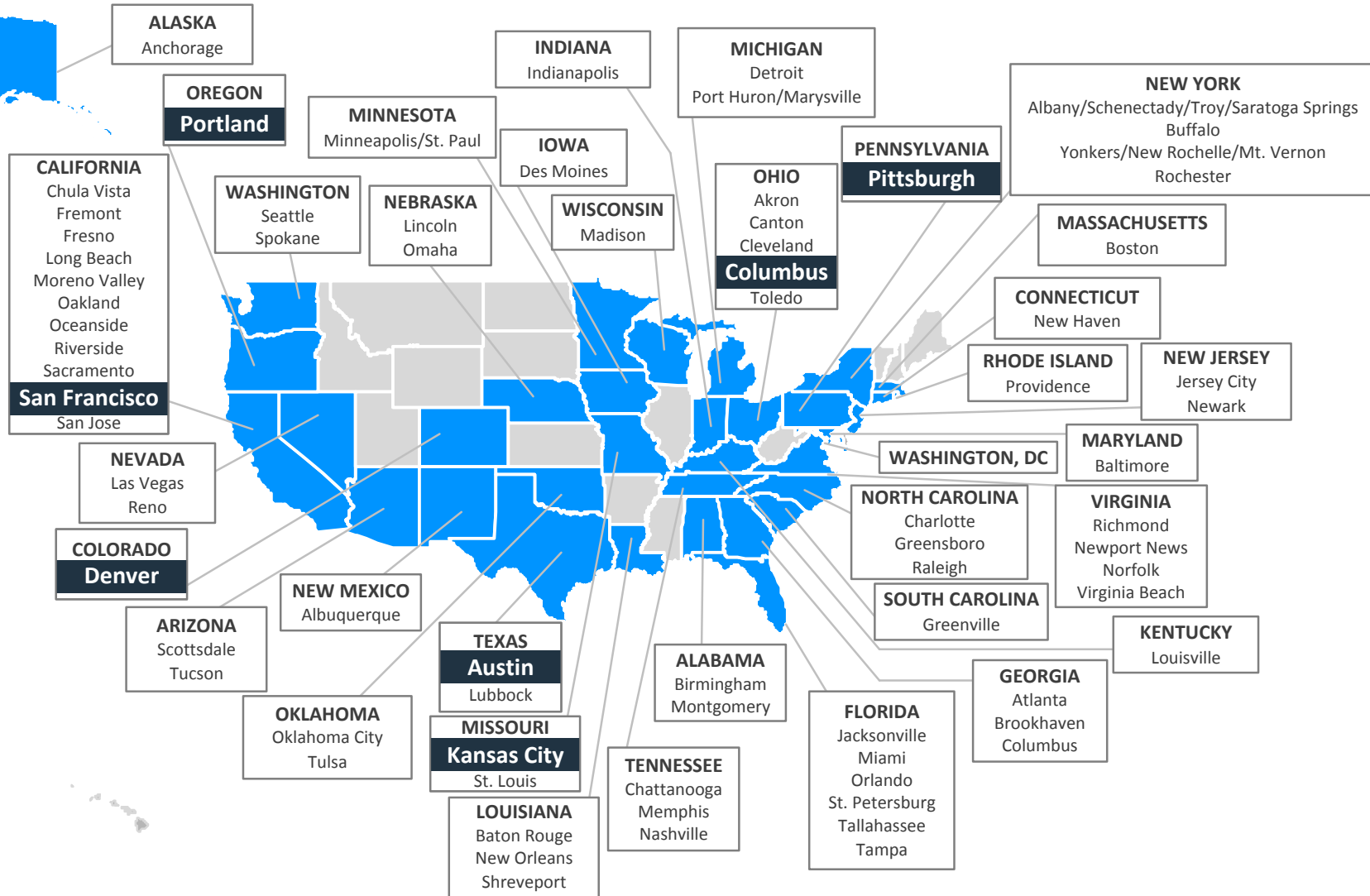 - Allows system managers to understand the impacts of investments and policies

- **Performance Evaluation**
  - Systematic and *objective* examination of measures and outcomes to understand the impacts of investments and policies have on performance, thus improving current and future planning and investment decisions
  - Conducted by an *independent party* who has no vested interest or stake in the project

Smart City Challenge Finalists

ALASKA
Anchorage

OREGON
Portland

CALIFORNIA
Chula Vista
Fremont
Fresno
Long Beach
Moreno Valley
Oakland
Oceanside
Riverside
Sacramento
San Francisco
San Jose

NEVADA
Las Vegas
Reno

COLORADO
Denver

ARIZONA
Scottsdale
Tucson

NEW MEXICO
Albuquerque

OKLAHOMA
Oklahoma City
Tulsa

TEXAS
Austin
Lubbock

MISSOURI
Kansas City
St. Louis

LOUISIANA
Baton Rouge
New Orleans
Shreveport

WASHINGTON
Seattle
Spokane

NEBRASKA
Lincoln
Omaha

MINNESOTA
Minneapolis/St. Paul

IOWA
Des Moines

WISCONSIN
Madison

INDIANA
Indianapolis

TENNESSEE
Chattanooga
Memphis
Nashville

ALABAMA
Birmingham
Montgomery

MICHIGAN
Detroit
Port Huron/Marysville

OHIO
Akron
Canton
Cleveland
Columbus
Toledo

PENNSYLVANIA
Pittsburgh

NEW YORK
Albany/Schenectady/Troy/Saratoga Springs
Buffalo
Yonkers/New Rochelle/Mt. Vernon
Rochester

MASSACHUSETTS
Boston

CONNECTICUT
New Haven

RHODE ISLAND
Providence

NEW JERSEY
Jersey City
Newark

WASHINGTON, DC

MARYLAND
Baltimore

NORTH CAROLINA
Charlotte
Greensboro
Raleigh

SOUTH CAROLINA
Greenville

VIRGINIA
Richmond
Newport News
Norfolk
Virginia Beach

KENTUCKY
Louisville

GEORGIA
Atlanta
Brookhaven
Columbus

FLORIDA
Jacksonville
Miami
Orlando
St. Petersburg
Tallahassee
Tampa

Locations Using 5.9GHz DSRC for Connected Vehicle Deployment

King County, WA

Southeast MI
Ann Arbor, MI
Ypsilanti Township, MI
Lansing, MI

Manhattan, NY* & Brooklyn, NY*
Long Island, NY (2)

Chittenden County, VT

Minneapolis, MN (2)

Pittsburgh, PA
Ross Township, PA

Salt Lake City, UT

San Francisco, CA

I-80 Corridor, WY*

Ann Arbor, MI
Oakland County, MI
Southwest MI
Lansing, MI

I-580, NV

Cleveland, OH

Fairfax County, VA

Sunnyvale, CA/ UC Berkely
San Jose, CA

Las Vegas, NV

I-70 Mountain Corridor, CO

Blacksburg, VA

Maricopa County, AZ

Greenville, SC

Orlando, FL

Orlando, FL

Tampa, FL*

Miami International Airport, FL

= USDOT Funded Projects
= Non-DOT Funded Projects

* Planned deployments in 2017
Source: Volpe – The National Transportation Systems Center (USDOT)

Number of DSRC-Enabled Vehicles: 28,193
Number of DSRC-Enabled Devices (V2V and V2I): 1,117

ITS Professional Capacity Building Program

- Offers FREE training to develop the ITS workforce

- Talking Transportation Technology webinars, with online archive

- ITS Standards (48 modules)

- ITS Transit Standards (14 modules)

- eLearning courses from Consortium for ITS Education (CITE):

    - Telecommunications and Networking Fundamentals

    - Network Design and Deployment Considerations for ITS Managers

- Workshops at ITS America State chapter meetings

www.pcb.its.dot.gov

How Do Signals Work?

Signal Timing Plans
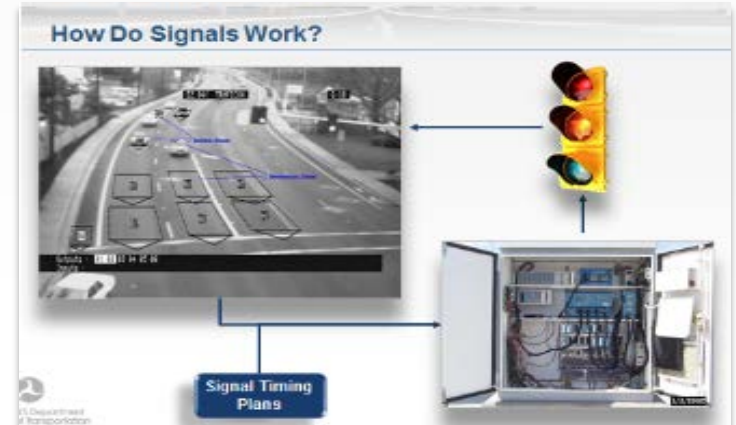
Additional Connected Vehicle Training Resources

- ITS PCB online course: CV 101 Web-based Training

- ITS PCB archived webinars:

  - CV Basics

  - National Connected Vehicle Field Infrastructure Footprint Analysis

- Connected Vehicle Reference Implementation Architecture (CVRIA)

  - http://www.iteris.com/cvria/html/resources/cvriatraining.html

  - http://www.iteris.com/cvria/html/forms/setittrainingform.php

- ITS ePrimer – Connected Vehicle Chapter   **www.pcb.its.dot.gov**