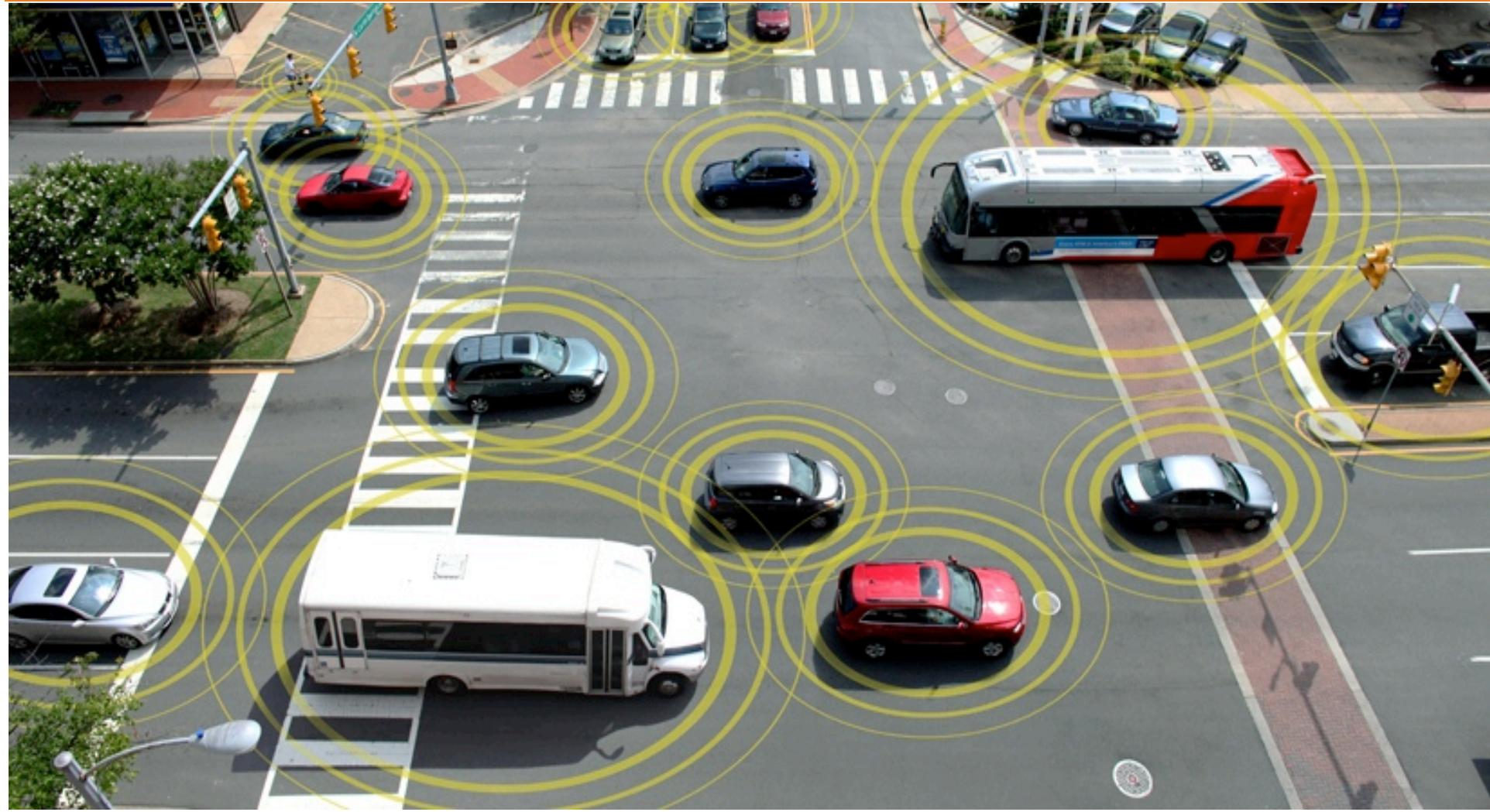


Workforce Tools (11:00-11:45)

- CV Deployments
- CV Pilots
- CV Training -
 - CV101
 - CV102
 - CV201
- ITSA State Chapter Workshops
- Additional CV/AV/Smart Cities training activities



Connected Vehicles



Connected Vehicle Workforce Tools

Technology convergence will revolutionize transportation, dramatically improving safety and mobility, enhancing ladders of opportunity, and reducing environmental impacts

Connected Vehicles

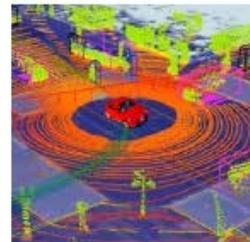
Vehicle Automation

Internet of Things

Machine Learning

Big Data

Sharing Economy



Connected-Automated Vehicles



Smart Cities

Benefits

- Order of magnitude safety improvements
- Reduced congestion
- Reduced emissions and use of fossil fuels
- Improved access to jobs and services
- Reduced transportation costs for gov't and users
- Improved accessibility and mobility



Envision Connected Everything



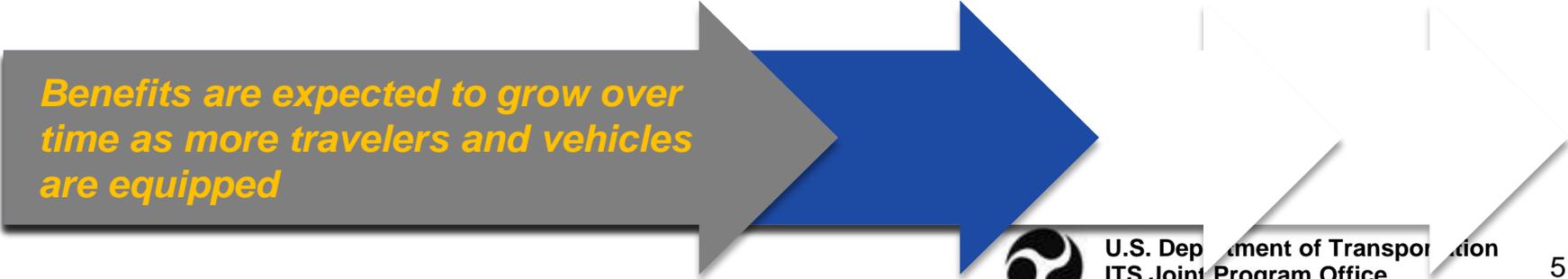
Potential Benefits

The injuries and fatalities of both vehicle occupants and vulnerable road users will be reduced both by reducing the crash rate and reducing the severity of those that still occur.

The information about travel conditions and options for both system users and operators will be increased and improved, thereby reducing congestion, improving travel time reliability, and providing greater choice of travel mode.

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

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 travelers and vehicles are equipped

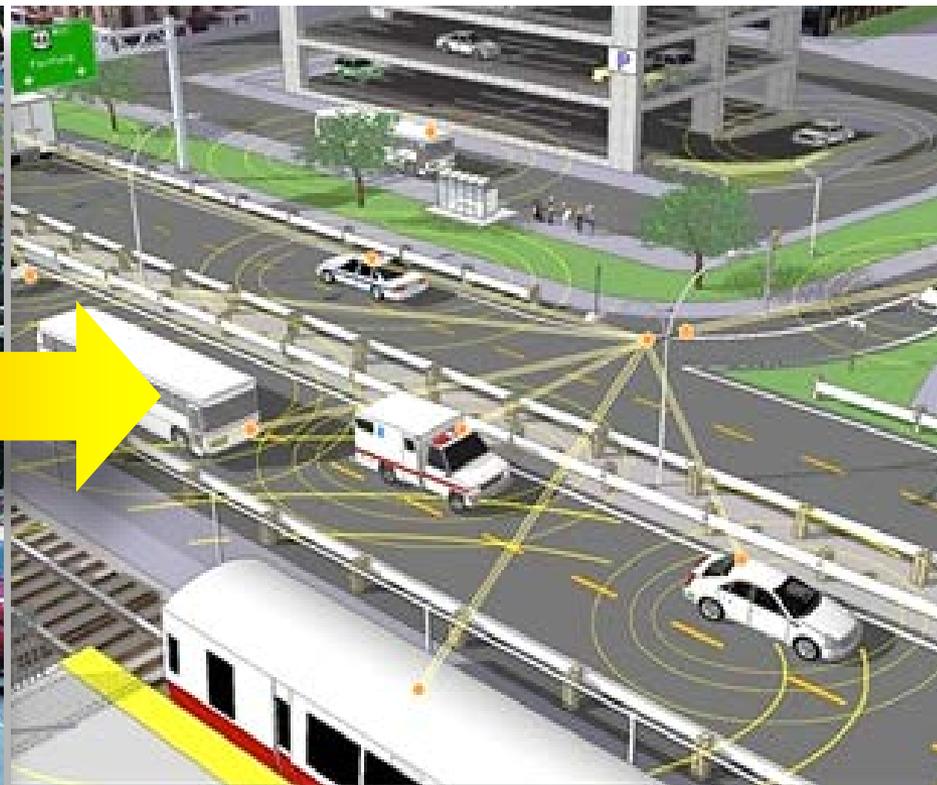


...But How Do I Get There From Today?

Today (Not Connected)

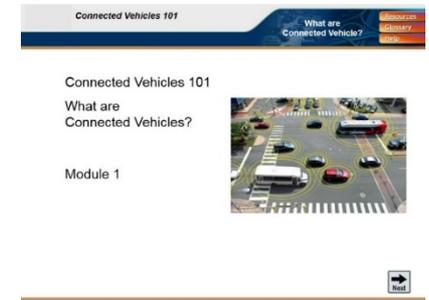


Future CV Environment



ITS PCB Connected Vehicle Offerings

- ITS and CV Training
 - CV 101 Workshop (Basic, High Level)
 - CV 101 eLearning Course
 - CV 102 Applications and Planning for Implementation
 - CV 200 Series (Under Development)
 - Developing a Plan for Implementing Connected Vehicle Projects
 - Developing a Deployment Plan for Implementing Connected Vehicle Projects
 - Incorporating Connected Vehicles into the Transportation Planning Process
 - ITS Standards
 - ITS Transit Standards



Connected Vehicle Training

The ITS Joint Program Office has released a [web-based training course](#) which provides an **intro Vehicle Reference Implementation Architecture (CVRIA)**. CVRIA provides a functional representation of a Connected Vehicle environment which can be used as a reference to define Connected Vehicle projects. This course acquaints public and private sector professionals with the background, structure, website, and use of CVRIA. The course material is presented in a web-based format using Adobe Presenter with narration by the CVRIA Architecture team.

Additional Connected Vehicle Training:

- [Connected Vehicles 101 - Introduction](#)
- [Connected Vehicles 102 - Applications and Planning for Implementation](#)

[Back to top](#)



CV 101 and CV 102

- Introduced CV environment
- Discussed communications technologies
- Introduced CV applications (safety, mobility, environment)
- Moving from research to implementation
- CV testing opportunities
- Policy and institutional issues
- Introduced a high-level deployment approach – identify needs, set performance goals/targets, select CV applications to meet those goals
- Reviewed applications and explained how they work/what they do
- Introduced security and privacy
- Listed actions agencies can take now to prepare for CV implementation



CV 200 Series (Under Development)

	Developing a Plan for Implementing Connected Vehicle Projects	Developing a Deployment Plan for Implementing Connected Vehicle Projects	Incorporating Connected Vehicles into the Transportation Planning Process
Target Audience	<i>General Audience: Transportation Engineers, Operators, System Engineers, Planners, Project Managers and Stakeholders interested in moving forward with CV Projects</i>	<i>Transportation Engineers, Project Managers, Operations Staff and Stakeholders that have an architecture in place and a plan to begin CV design and deployments.</i>	<i>Transportation Planners, Program Managers and Stakeholders that have identified system/network needs and have determined that CV projects will provide a significant impact.</i>
Course Objectives	Focus on the CV planning and implementation process that sets the stage for a CV deployments that have observable, measureable near-term impact, are deployed on-time and within budget, and reduce technical, institutional, and financial risk.	Focus is on developing a comprehensive deployment plan for a CV project or set of projects.	Effective ways to incorporate CV technology applications into the planning process Explain the process for incorporating CV-related planning processes and products into planning and programming functions in the next few years at the State and local level. Activities a region can undertake to prepare for future CV implementation.



ITS America State Chapter Upcoming Courses

ITS Connecticut	9/28/16	Berlin, CT	Connected Vehicle 102
ITS Tennessee/NRITS	10/3/16	Chattanooga, TN	Connected Vehicle 102
ITS Midwest	10/12/16	Indianapolis, IN	Connected Vehicle 102
ITS Colorado	10/21/16	Denver, CO	Connected Vehicle 201
ITS Illinois/ITS Midwest	11/1/16	Springfield, IL	Connected Vehicle 201
ITS New York	Late November	Hawthorne, NY	Connected Vehicle 201



ITS PCB Connected Vehicle Offerings

- Connected Vehicle Reference Implementation Architecture (CVRIA)
 - <http://www.iteris.com/cvria/html/resources/cvriatraining.html>
 - <http://www.iteris.com/cvria/html/forms/setittrainingform.php>
- T3 Live/Archived Webinars
 - ITS ePrimer Webinar Series
 - Cyber Security
 - National Connected Vehicle Field Infrastructure Footprint Analysis
 - Automated Vehicles and Policy
 - Transportation Management Center (TMC) Video Best Practices
 - ITS Applications for Bicycles and Pedestrians
 - CV Basics
 - Connected Vehicle Workforce



CVRIA CONNECTED VEHICLE REFERENCE IMPLEMENTATION ARCHITECTURE

About | Applications | Views | Standards | Resources

[Home](#) > [Resources](#) > [Training](#) > CVRIA Training



ITS PCB Connected Vehicle Future Offerings (Coming 2017)

- ITS and CV Training
 - CV 102 Applications and Planning for Implementation – *eLearning course*
 - New Practitioner Basic and Practitioner Advanced Workshops
 - ITS Standards (8 new modules, 8 updated modules)
 - ITS Transit Standards (10 modules)
- ITS in Academics
 - Case Studies
 - Civil Design
 - Concepts of Operations
 - ITS/CV Lesson Plans for High School/Middle Schools & Community Colleges/Technical Schools
- Knowledge Exchange
 - Revitalized Peer 2 Peer Program



CV Pilot Deployment Program Goals



CV Pilot Deployment Resources

United States Department of Transportation About DOT | Briefing Room | Our Activities

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Intelligent Transportation Systems Joint Program Office

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Research Archive

- ▶ Safety
- ▶ Mobility
- ▶ Environment
- ▶ Road Weather
- ▶ Policy
- ▶ Connected Vehicle Technology
- ▶ **CV Pilots Deployment Project**
 - Pilots Deployment Project
- ▶ Automated Vehicle
- ▶ Intermodal
- ▶ Exploratory
- ▶ ITS Cross-Cutting Support
- ▶ Success Stories

Connected Vehicles Connected Vehicle Pilot Deployment Program



CV Pilots News & Events

- Connected Vehicle Pilot Program Enters Phase Two 9/6/16
- The Presentation of Materials and the Webinar Recordings of the Insights, Challenges, and Lessons Learned from the First Phase are now available. 8/25/16
- Safety Pilot Model Deployment Lessons Learned and Recommendations for Future Connected Vehicle Activities report is now available 6/28/16
- NYCDOT Concept of Operations (ConOps) Report is now available 6/28/16
- The presentation materials and the webinar recordings of the Performance Measurement and Evaluation Support Plan webinars from the three pilot sites are now available 6/13/16
- Security Management Operational Concept reports of ICF-Wyoming and Tampa (THEA) are now available 6/8/16
- The SCMS Proof-of-Concept EE Requirements Version 1.1 is now available 5/20/16

[More news »](#)

CV Pilots Portal

-  [Pilot Sites](#)
-  [Technical Assistance Events](#)
-  [CV Applications](#)
-  [Sample Deployment Concepts](#)
-  [Publications](#)



Smart City Resources

 **Transportation.gov**
U.S. Department of Transportation

▼ About DOT ▼ Our Activities ▼ Areas of Focus

Home > Policy Initiatives

Smart City Challenge



Columbus wins the Smart City Challenge!

[U.S. Department of Transportation Announces Columbus as Winner of Unprecedented \\$40 Million Smart City Challenge](#)



[More on the Smart City Challenge](#)

Related Links

- [Learn More about our Information Sessions](#)
- [Watch the Smart City Forum archived webcasts](#)
- [Read the second Smart City Challenge Notice of Funding Opportunity](#)
- [Read answers to some common Challenge questions](#)
- [Sign up for Smart City Challenge email updates](#)
- [Watch previous webcasts, including the kickoff with Secretary Foxx](#)

Contact Us

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TTY/Assistive Device: 800-877-8339

Business Hours:
9:00am-5:00pm ET, M-F

Tags

- [connected vehicles](#)
- [smart cities](#)
- [v2v](#)
- [v2i](#)

Share



Resources and Tools to Support CV Deployments

- FHWA Deployment Guidance
- CO-PILOT
- Standardized Interfaces (CVRIA)
 - SET-IT Tool
- OSADP
- Research data exchange (RDE)
- CV Technology Topics



- Resources Links
 - <http://www.its.dot.gov/resources.htm>
 - [Connected Vehicle Basics](#)
 - [Connected Vehicle Test Beds](#)
 - [ITS and You](#)
 - [ITS Asset Viewer](#)
 - [ITS Evaluation](#)
 - [Knowledge Resources](#)
 - [Research Data Exchange](#)
 - [Staff Presentations](#)



Resources and Tools to Support CV Deployments

- FHWA Guidance to State and local agencies for implementing V2I to ensure interoperability and efficient and effective planning, procurement, and operations
- Goal is to provide:
 - Initial advice
 - Best practices
 - Technical support tools
- Products and tools:
 - Model Approach to Advanced Technologies Procurement Using Agile System Engineering (Targeted release in 2017/2018)
 - Connected Vehicles and the Planning Process
 - Guide to Licensing DSRC
 - Pre-Deployment Guidance for V2I Safety Applications (Targeted release in 2017/2018)
 - Estimating Benefits and Economic Impacts of V2I Deployments
 - V2I Message Lexicon
 - Near Term Transition and Phasing for V2I Deployments
 - Connected Vehicle Training Resources



CO-PILOT



HOME COST ESTIMATION HELP



HIGH-LEVEL ESTIMATION of your Proposed Deployment Costs



Interested in learning more about the CV Pilots Deployment Project? Visit <http://www.its.dot.gov/pilots/> for more information



CO-PILOT Values Your Input! Please take a few minutes to respond to our user-experience survey by clicking [HERE](#)

ABOUT OUR TOOL

The Cost Overview for Planning Ideas & Logical Organization Tool (CO-PILOT) is a high-level tool supporting stakeholders considering connected vehicle pilot deployments. These pilot deployments will combine connected vehicle and mobile device technologies innovations to **Improve Traveler Mobility** and **System Productivity** while **Reducing Environmental Impacts** and **Enhancing Safety**.

The CO-PILOT allows stakeholders to **Easily Estimate Costs of your Proposed Pilot Deployments**. This initial tool allows cost estimation for 56 applications in the Vehicle to Infrastructure Safety, Vehicle to Vehicle Safety, Agency Data, Environment, Road Weather, Mobility, and Smart Roadside application groups.

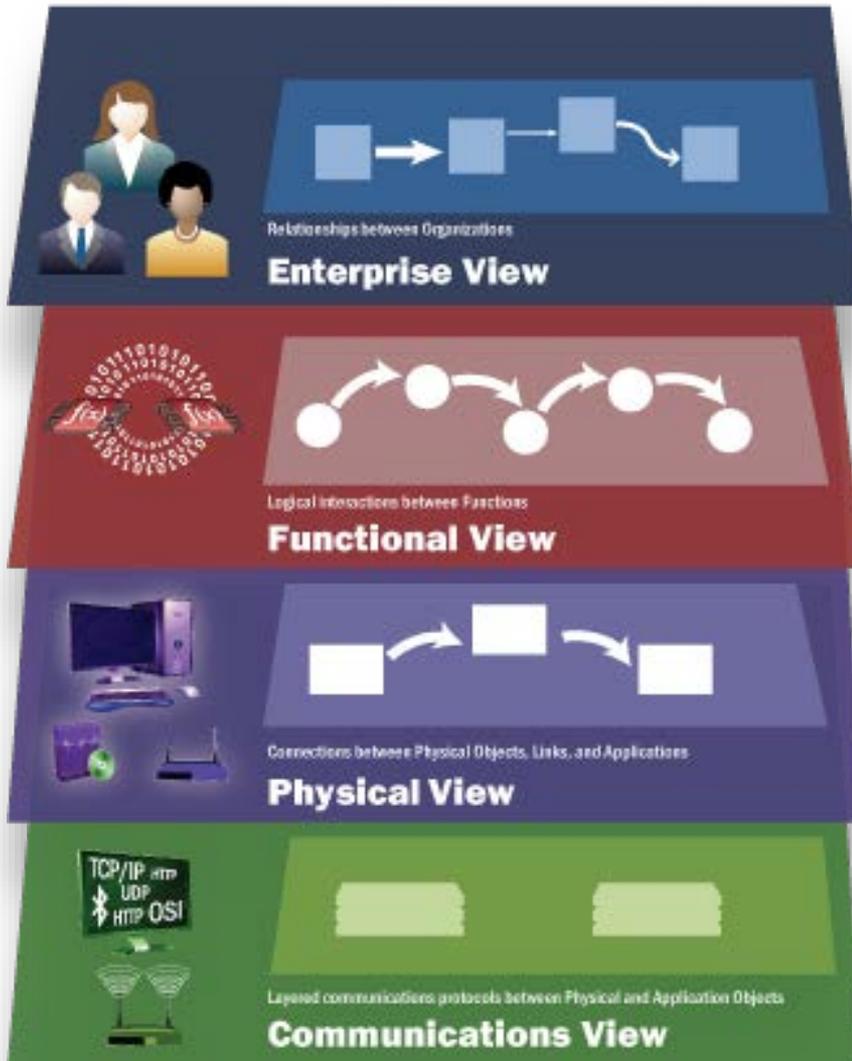
[Start Using The Tool](#)

HAVE YOUR ESTIMATED COST IN 4 EASY STEPS:

HAVE QUESTIONS?

Connected Vehicle Reference Implementation Architecture (CVRIA)

Connected Vehicle Reference Implementation Architecture



CVRIA: A Framework for integrating technologies and identifying interfaces for standardization

<http://www.iteris.com/cvria/>

- The Systems Engineering Tool for Intelligent Transportation (SET-IT) is available for download from the CVRIA website
- On-line training for CVRIA and SET-IT are available on the CVRIA website



U.S. Department of Transportation
ITS Joint Program Office

Open Source Application Development Portal (OSADP)

- Web-based portal for sharing open source code and software from USDOT-sponsored transportation application to the public
 - 14 open source ITS application packages, with more expected
 - Download software, code, and documentation
 - Free to use, edit, and modify under open source licenses
 - Submit and develop new project ideas (GitHub testing platform)
 - Join and interact with a community of users
 - Download - software, code and documentation



Welcome to Open Source Application Development Portal!

A channel for distributing and collaborating on transportation related open source applications

www.itsforge.net

ACCESS, INNOVATE, and COLLABORATE



Research Data Exchange

- Promotes sharing of archived and real-time connected vehicle data collected in USDOT-sponsored research efforts and field tests
- 2 TB of well-organized and documented data
- Drawn from a dozen geographic locations across the country
- Multi-source data (traditional sensor plus probe and connected vehicle data)
- Search and download functions
- RDE release 2.0 is now available



Data Environment Release Schedule

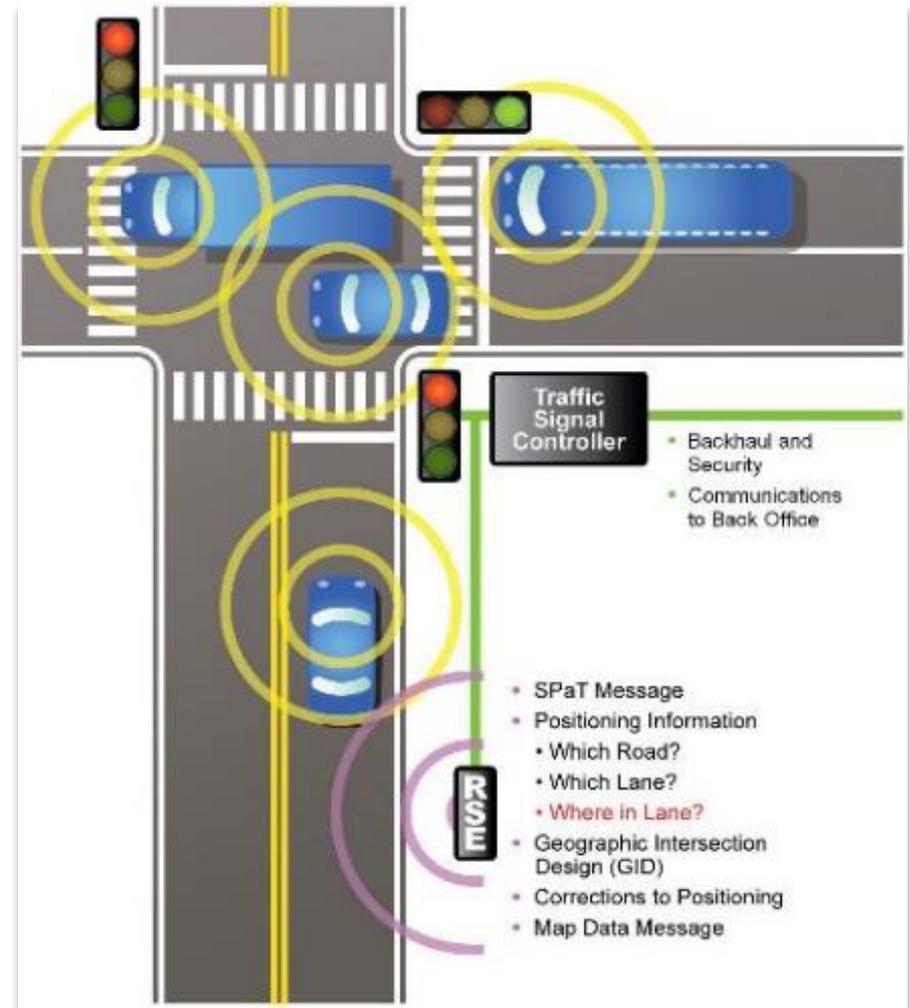
- Safety Pilot Instrumented Vehicles - September 2016

www.its-rde.net



V2I Reference Implementation

- A system of specifications and requirements that allow the various components of V2I hardware, software, and firmware to work together
- An agency will be able to select the capabilities and applications desired at a given installation
- Integrated V2I Prototype
 - Field research testing in 2015
 - Reference Implementation builds upon Integrated V2I Prototype



ITS Knowledge Resources

Intelligent Transportation Systems
Joint Program Office



Knowledge Resources

Home

Benefits Database

Costs Database

Lessons Learned

Fact Sheets

Deployment Statistics

Asset Viewer

Contact Information

Knowledge Resources Home

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Enter Keyword

in All

GO

Connected Vehicles

Browse CV Benefits

Browse CV Costs

Submit Your Data

Please share any documentation that you may have regarding benefits and costs of ITS.

Contribute now!

Welcome to U.S. DOT ITS Knowledge Resources

Intelligent transportation systems (ITS) provide a proven set of strategies for advancing transportation safety, mobility, and environmental sustainability by integrating communication and information technology applications into the management and operation of the transportation system across all modes. This website presents information on the benefits, costs, deployment levels, and lessons learned for ITS deployment and operations over 20 years of ITS evaluation studies, research syntheses, handbooks, journal articles, and conference papers tracking the effectiveness of deployed ITS.

Browse Resource Databases

Benefits

Costs

Lessons Learned

Deployment Statistics



BROWSE BENEFITS

Benefits measure the effects of ITS on transportation operations according to the six goals identified by the U.S. Department of Transportation (U.S. DOT): safety, mobility, efficiency, productivity, energy and environmental impacts, and customer satisfaction.

Please choose one from the following options:



ITS JOINT PROGRAM OFFICE