Professional Capacity Building

Appendix A

www.its.dot.gov/index.htm
Draft — September 6, 2015

Source: USDOT

U.S. Department of Transportation

Produced by
U.S. Department of Transportation

Notice

Table of Contents

Professional Capacity Building (PCB)

Introduction

The U.S. Department of Transportation (USDOT) Intelligent Transportation Systems (ITS) Professional Capacity Building (PCB) program is developing a comprehensive training and education implementation plan for connected vehicle professionals, including current and future transportation operations managers, engineers, and technicians. The plan will meet the following objectives:

1. Understand the workforce needs of connected vehicle infrastructure deployers, from both the public and private sector
2. Create a systematic, multi-year connected vehicle training and education implementation plan for the ITS PCB program that lays out a coordinated effort in a timeline of knowledge building activities
3. Identify long- and short-term support to meet connected vehicle program training and educational needs
4. Identify all entities involved in providing connected vehicle training and education, and determine proper coordination roles for each of these entities to ensure stakeholder knowledge gaps are met and duplication is minimized.

Once the connected vehicle training and education plan is finalized in 2015, the ITS PCB Program will begin to identify existing and develop new learning resources targeted toward connected vehicle infrastructure deployers at the appropriate level of technical detail for transportation program managers, project engineers, operations engineers, and technicians. These materials may be developed by the USDOT or its partners in learning and professional development, such as the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), ITS America, the Society of Automotive Engineers (SAE), and others.

The following table provides references to currently available training materials on connected vehicle technology, offered by the USDOT ITS PCB program and other training organizations. Links to these materials are available at www.pcb.its.dot.gov.

USDOT Connected Vehicle Training Resources

Resources	Target Audience
Connected Vehicle (CV) 101 - *eLearning version coming in summer 2015* This 4-hour instructor-led workshop provides an introduction to the principles of connected vehicle technology. Participants will learn about the safety, mobility, and environmental applications envisioned for the connected vehicle environment. They will gain an overview of the infrastructure requirements being developed, including communication standards; operations and maintenance implications; and upcoming policy decisions. The workshop will include a report on the ITS test beds and model deployment in Ann Arbor, Michigan, and the Connected Vehicle Pilot Deployments. The workshop solicits participant feedback regarding their decision factors and needs concerning the future connected vehicle environment. This training is offered in partnership with ITS America at state chapter meetings.	Public and private sector transportation managers, project engineers, operations staff, and transportation planners
CV102 - *Available in 2015* This 3- to 4-hour instructor-led workshop will build on CV101 by providing additional details about future connected vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) applications. It will describe initial considerations for deploying the enabling technology such as identifying regional and local transportation challenges; developing deployment concepts; integrating connected vehicle projects into ongoing operations; determining the kinds of data to collect and share; establishing communication and physical security needs through a prototype Security Credential Management System; and determining the number of roadside installations, mobile devices, or vehicles necessary for operational deployments of connected vehicle applications. The objective of the workshop is to prepare transportation managers, project engineers, and operations staff for participating in a connected vehicle pilot deployment. CV102 is offered in partnership with ITS America at state chapter meetings.	Public and private sector transportation professionals who are considering planning and implementing connected vehicle projects

Resources	Target Audience
CV201 - *Available in 2015* This 4-hour workshop will deepen the student's understanding of the common technical platform for the connected vehicle environment, supporting the goal of transitioning connected vehicle technology research toward full deployment. The workshop will discuss the types of information that may be exchanged between the connected devices that make up the connected vehicle environment, using the Connected Vehicle Reference Implementation Architecture (CVRIA) as a planning tool. It will introduce the ITS standards that support the deployment of the connected vehicle infrastructure and applications. This workshop will explore the prototype national-level Security Credential Management System as a key tool for implementing a Public Key Infrastructure based system for communication security controls. CV201 is offered in partnership with ITS America at state chapter meetings. **Link: www.pcb.its.dot.gov**	• Transportation engineers or managers who want a deeper understanding of the technologies involved in vehicle-to-vehicle and vehicle-to - infrastructure applications • Private and public sector vendors, including manufacturers
Talking Transportation Technology (T3) Webinars T3 webinars are free, 90-minute, interactive online meetings that offer knowledge sharing on topics related to ITS planning, design, procurement, deployment, and operations. The following archived webinars are available on connected vehicle topics: ▪ *Connected Vehicle Basics – April 24, 2014* ▪ *National Connected Vehicle Infrastructure Footprint Analysis Webinar – May 22, 2014* ▪ *Connected Vehicle Reference Implementation Architecture (CVRIA) Webinar #1: V2I Safety Applications – November 6, 2013* ▪ *Connected Vehicle Reference Implementation Architecture (CVRIA) Webinar #2: Traffic Signal Applications – November 14, 2013* ▪ *Connected Vehicle Reference Implementation Architecture (CVRIA) Webinar #3: Road Weather – November 19, 2013* ▪ *Connected Vehicle Reference Implementation Architecture (CVRIA) Webinar #4: Trucks – November 26, 2013* ▪ *Connected Vehicle Reference Implementation Architecture (CVRIA) Webinar #5: Support Applications – December 3, 2013* ▪ *Connected Vehicle Reference Implementation Architecture (CVRIA) Webinar #6: Transit Applications – December 10, 2013* ▪ *Connected Vehicle Reference Implementation Architecture (CVRIA) Webinar #7: R.E.S.C.U.M.E. – December 17, 2013* **Link: http://www.pcb.its.dot.gov/t3_archives.aspx.**	Public and private sector transportation managers, project engineers, operations staff, and transportation planners

Resources	Target Audience
Email List: To receive announcements of upcoming T3 webinars on ITS topics, send an email to T3@dot.gov with the subject line "Add to Email List."	
Connected Vehicle Reference Implementation Architecture (CVRIA) Training This web-based training course provides an introduction to the CVRIA. The purpose of this training is to acquaint public and private sector professionals with the background, structure, website, and use of the CVRIA. After completing the course, they will be able to effectively navigate the website to find the CVRIA content they need for their connected vehicle project definition. The course material is presented in a web-based format using Adobe Presenter with narration by instructors from the National ITS Architecture team. **Link: http://www.iteris.com/cvria/html/resources/cvriatraining.html**	Public and private sector transportation professionals who are considering planning and implementing connected vehicle projects
Connected Vehicle Pilot Deployment Program Resources These resources include presentations, briefings, and a series of webinars that summarize the objectives and requirements of the Connected Vehicle Pilot Deployment program. This program seeks operational deployments of connected vehicle applications that concurrently capture and utilize new forms of connected vehicle and mobile device data to improve multimodal surface transportation system performance and enable enhanced performance-based systems management. **Link: http://www.its.dot.gov/pilots/index.htm**	Public and private sector transportation professionals who are considering planning and implementing connected vehicle pilots
Connected Vehicle Test Beds PlugFests The USDOT Connected Vehicle PlugFests are events during which devices are tested for interoperability with emerging connected vehicle standards. The PlugFests allow for the sharing of information and lessons learned, development of a common technical platform, and expansion of test bed options. This event supports USDOT goals to transition connected vehicle technology research toward full deployment. Each PlugFest features a 3-hour webinar training session and a 2-day laboratory testing session. The PlugFest training sessions are open to anyone interested in attending. The PlugFest testing sessions are open only to those organizations that have signed the Affiliated Test Bed Memorandum of Agreement (MOA) and the Amendment to the Affiliated Test Bed MOA. **Link: http://www.its.dot.gov/testbed/plugFests.htm**	Public and private sector transportation professionals who will be testing connected vehicle applications and equipment

Resources	Target Audience
ITS Standards Training Modules - *Available in fall 2015* ▪ *Vehicle-to-Vehicle (V2V) ITS Standards for Project Managers:* This module provides an introduction to the connected vehicle environment and a description of the V2V environment and its potential benefits to surface transportation systems operators. The module presents several V2V safety, mobility, and environmental applications and discusses how these applications impact surface transportation operations. It also reviews the types of information that may be exchanged between the connected devices that make up the V2V environment. The module then presents the ITS standards that help support the deployment of the V2V environment and applications. The module also introduces some of the challenges to implementing the V2V environment and how surface transportation systems can support this environment. ▪ *Vehicle-to-Infrastructure (V2I) ITS Standards for Project Managers:* This module provides an introduction to the connected vehicle environment and a description of the potential benefits and capabilities of a V2I environment. The module presents several V2I safety, mobility, and environmental applications and discusses the types of information that may be exchanged between the different devices that make up the V2I environment. The module then presents the ITS standards that help support the deployment of a V2I application and a V2I infrastructure. The module also introduces some of the challenges to designing and implementing a V2I infrastructure, and provides some strategies and approaches to deploying the infrastructure. **Link: http://www.pcb.its.dot.gov/stds_training.aspx**	• Public sector managers of surface transportation systems and agencies • Procurement officials for surface transportation agencies • Private and public sector vendors, including manufacturers

Resources	Target Audience
Videos The USDOT has developed or obtained rights to the following videos to illustrate the concept of connected vehicles and help the public understand its potential benefits: ▪ *The Future of Transportation* **is an** animated video showing connected vehicles in action, moving through several scenarios that highlight the technology's benefits in safety, mobility, environment, road weather, and emergency response. The video is available at: **http://www.its.dot.gov/library/media/15cv_future.htm** ▪ *Vehicle to Vehicle Communication: A New Generation of Driver Assistance and Safety* is an informational video that demonstrates applications that have been piloted by the Crash Avoidance Metrics Partnership using dedicated short range communications (DSRC): blind spot warning, forward collision warning, emergency electronic brake light, intersection movement assist, and do not pass warning. Available at: **http://www.its.dot.gov/library/media/v2v_video.htm** ▪ *The Next Big Thing: What's the future of so-called talking cars?* describes the DSRC technology that provides the basis for connected vehicles and discusses some of the technical and policy challenges involved in implementation. Available at: **https://www.youtube.com/watch?v=j5jsxrGWrX4&list=PLAI4aZK3mRv14yTHaMQL9m1u5V8nH60Rj&feature=player_embedded** (*USDOT link coming soon*) ▪ **Connected Vehicles and the Future of Transportation** was recorded at the Strategic Highway Research Program 2 Regional Operations Forum. The presenter discusses the basics of connected vehicles and automated vehicles including connected vehicle applications and technology, policy considerations, and how public agencies can prepare for this new environment. Available at **https://www.youtube.com/watch?v=HNS17Iq9QCw&feature=youtu.be** ▪ Additional videos can be found in the ITS JPO video library at the link below**.** **Link: http://www.its.dot.gov/library/video.htm**	• Public and private sector transportation professionals • Students interested in pursuing a career in transportation • General public

Resources	Target Audience
ITS ePrimer Module on Connected Vehicles The ITS ePrimer is an online resource introducing fundamental concepts and practices related to ITS technologies. The ITS ePrimer is both a stand-alone reference document for the practitioner as well as a text for education and training programs. This module provides an overview of current and emerging technology and the institutional, policy, and funding challenges of connected vehicle applications. **Link: http://www.pcb.its.dot.gov/eprimer/module13.aspx**	• Public and private sector transportation professionals • Students interested in pursuing a career in transportation

Connected vehicle technology is a dynamic and rapidly evolving field with new information, applications, and devices being developed every day. As more training and education resources become available, they will be added to the ITS PCB website at http://www.pcb.its.dot.gov.

U.S. Department of Transportation
ITS Joint Program Office-HOIT
1200 New Jersey Avenue, SE
Washington, DC 20590

Toll-Free "Help Line" 866-367-7487
www.its.dot.gov

U.S. Department of Transportation