U.S. Department of Transportation
Intelligent Transportation Systems Program Advisory Committee

ITS Program Advisory Committee

Meeting of
May 24, 2012

Meeting Minutes

CONTENTS

1. General

a. The Intelligent Transportation Systems (ITS) Program Advisory Committee (ITS PAC) met May 24, 2012, in room E37-302, U.S. Department of Transportation (U.S. DOT), 1200 New Jersey Avenue, S.E. Washington, DC.

b. These minutes provide a summary of the meeting proceedings. A copy of the minutes, the meeting transcript, and other meeting documents are available for public inspection and downloading from the ITS PAC website at http://www.its.dot.gov/itspac/index.htm.

2. Meeting Attendance

a. Committee members present:

Mr. Robert Denaro, Vice President, Nokia, Committee Chairman
Dr. Teresa Adams, Chair, Transportation Management and Policy Program and Director, National Center for Freight and Infrastructure Research and Education, University of Wisconsin-Madison
Mr. Stephen Albert, Director, Western Transportation Institute, Montana State University
Mr. Scott Belcher, President and CEO, Intelligent Transportation Society of America
Mr. Roger Berg, Vice President of Wireless Technologies, DENSO North American Research Laboratories
Mr. Joseph Calabrese, CEO, Greater Cleveland Regional Transit Authority
Mr. John Capp, Director of Global Active Safety Electronics, General Motors Corporation
Ms. Paula Hammond, Secretary, Washington State Department of Transportation
Mr. Sonny Holtzman, Principal, The Holtzman Group
Mr. Steve Kenner, Global Director of Automotive Safety, Ford Motor Company
Mr. J. Peter Kissinger, President and CEO, American Automotive Association Foundation for Traffic Safety
Dr. Hans Klein, Associate Professor, School of Public Policy, Georgia Institute of Technology
Mr. Scott McCormick, President, Connected Vehicle Trade Association
Dr. Raj Rajkumar, Professor, Department of Electrical and Computer Engineering, Carnegie Mellon University
Mr. Brian Schromsky, Director, Federal Government and Public Safety, Verizon Wireless
Mr. Ton Steenman, Vice President/General Manager, Intelligent Systems Group, Intel Corporation
Mr. Kirk Steudle, Director, Michigan Department of Transportation
Mr. George Webb, County Engineer, Palm Beach County, Florida

b. Others present:

Mr. Greg Winfree, Deputy Administrator, Research and Innovative Technology Administration, U.S. Department of Transportation

Ms. Shelley Row, Director, ITS Joint Program Office, Research and Innovative Technology Administration, U.S. Department of Transportation

Ms. Sheila Andrews, American Motorcyclist Association

Ms. Valerie Briggs, Team Lead, Knowledge and Transfer Policy, ITS Joint Program Office, Research and Innovative Technology Administration, U.S. Department of Transportation

Mr. Brian Cronin, Team Lead, Research, ITS Joint Program Office, Research and Innovative Technology Administration, U.S. Department of Transportation

Ms. Linda Dodge, Chief of Staff and Program Manager, Public Safety and Rural Programs, ITS Joint Program Office, Research and Innovative Technology Administration, U.S. Department of Transportation

Mr. Stephen Glasscock, Program Coordinator, ITS Joint Program Office, Research and Innovative Technology Administration, U.S. Department of Transportation (ITS PAC Designated Federal Official)

Mr. Sam Lamagna, Product Line Manager, Intel Corporation

Mr. Bob Leonard, Metropolitan Washington Council of Governments

Mr. Bob Monniere, Office of the Chief Counsel, Research and Innovative Technology Administration, U.S. Department of Transportation

Ms. Imre Szauter, American Motorcyclist Association

Mr. Carlos R. Vélez, Jr., Project Manager, Citizant, Inc.

3. **Meeting Action Items**

a. Committee Chairman Bob Denaro will send ITS PAC members an email requesting that the new subcommittees (see 5.g.(2), p. 12):

(1) Confirm their subcommittee titles.

(2) Develop a subcommittee charge.

(3) Describe their process for accomplishing their charge.

(4) Identify requirements for outside help.

b. The ITS JPO will send the ITS PAC an email with a Doodle® poll of October meeting date options (see 5.i.(2), p. 13).

4. **Meeting Agenda**

a. Welcome and Opening Remarks: Mr. Winfree, Ms. Row, and Mr. Denaro

b. Introduction by Committee Members: Mr. Denaro

c. ITS JPO Overview: Ms. Row

d. ITS JPO Briefing and Group Discussion: Mr. Schagrin, Ms. Briggs, Mr. Cronin

e. Implementation Approach Discussion: Ms. Briggs

f. Committee Focus Discussion: Mr. Denaro

g. Committee Organization Discussion: Mr. Denaro

h. Future Meeting Discussion: Mr. Denaro

i. Adjourn: Mr. Denaro

5. **Summary of Proceedings**

a. Welcome and Opening Remarks

(1) Mr. Denaro called the meeting to order and invited Ms. Row to make opening remarks.

(2) Ms. Row stated that Mr. Winfree would be joining the meeting later to welcome the committee members. Pending his arrival, Ms. Row welcomed committee members and emphasized that the Department takes very seriously the committee's advisory role and looks forward to their input on the ITS Program. She added that the ITS JPO staff presentations that would be made during the meeting would address the Connected Vehicle Program, which the ITS JPO hopes will be the major focus of the ITS PAC's input; however, the committee can choose to focus its time on other topics. Ms. Row explained that the presentations were intended to be participatory discussions, and encouraged committee members to make comments and/or ask questions during those presentations.

(3) Mr. Denaro also welcomed committee members and addressed the following major points:

(a) Most of the committee's work will be accomplished at in-person meetings, with extensive interaction with the ITS JPO staff. However, since the committee will meet only two or three meetings a year, it will need to determine ways to maintain consistency and continuity between meetings.

(b) During its future deliberations, committee members should maintain focus on what eventually will need to be included in the committee's final product – an advice memorandum to the Secretary.

(c) Although not all committee members will be able to attend all meetings, they should work their schedules to attend as many meetings as possible because, as he stated earlier, most of the committee's work will be accomplished during, and not between the meetings.

(d) The ITS PAC's role is to review the ITS Program and advise the ITS JPO. One way to view this role is from a negative perspective, i.e., if the Connected Vehicle is not successfully deployed and we don't have communicating cars or ITS solutions that are saving money, what might be the cause of that? What might get in the way? The committee should try to answer these questions -- to determine what the potential barriers and risks might be, and then to advise the JPO on how to overcome those barriers and risks.

(e) It is critical to the committee's success that all members contribute to the extent possible. If members miss any meetings, the meeting minutes and other materials will be available to help them catch up.

(f) The committee chairman's role is not to dictate but to facilitate consensus building among the members.

b. Introductions by Committee Members

(1) Mr. Denaro requested that committee members introduce themselves with a brief statement of their ITS experience, their expectations for the committee's work, and what they hope to personally gain from their committee involvement.

(2) During the introductions, Mr. Winfree arrived and was invited by Mr. Denaro to present his welcoming remarks.

c. Welcome by RITA Deputy Administrator, Greg Winfree

(1) Mr. Winfree thanked committee members for contributing their time and service on the committee.

(2) Mr. Winfree concluded his brief remarks by stating that ITS technology is "game-changing" technology that will take the transportation system to the next generation and beyond.

d. ITS JPO Overview

(1) Ms. Row stated that the ITS JPO role is primarily to manage ITS research, and that ITS implementation is the role of the ITS JPO's modal partners. Technology transfer activities facilitate the transition from research to implementation. Each ITS research program includes a technology transfer component to help focus the research on the implementation goals.

(2) The Connected Vehicle Program, which is the current focus of ITS research, is moving from research to implementation. It is in this area – successful Connected Vehicle implementation – that the ITS JPO would like to have the ITS PAC's assistance.

(3) Although the ITS JPO's modal partners have ITS program funding, it is minimal compared to the $110 million annual ITS JPO budget, most which is dedicated to the Connected Vehicle Program. Ms. Row provided the following definitions of Connected Vehicle Program acronyms:

V2V	Vehicle-to-Vehicle
V2I	Vehicle-to- Infrastructure
V2P	Vehicle-to-Pedestrians
V2X	Vehicle-to-Other; e.g., motorcycles

(4) Ms. Row continued to describe other key elements of the ITS Program, including:

(a) Dynamic Mobility Applications (DMA)

(b) Dedicated Short-Range Communications (DSRC)

(c) Applications for the Environment: Real-Time Information Synthesis (AERIS)

(d) DCM (Data Capture and Management)

(e) Standards and Architecture Program

(f) Professional Capacity Building Program

(5) Ms. Row concluded her ITS JPO overview by emphasizing that, although the ITS JPO staff is small, it is a very talented staff whose work is greatly enhanced by its collaborative relationships with its modal partner staffs, also very talented. The ITS JPO is dedicated to making available to the ITS PAC the people, documents, and other resources necessary to effectively perform its advisory role.

(6) Dr. Klein asked if the ITS JPO had considered the potential for a consumer demand-driven "explosion" in the implementation of ITS technologies, and how such an explosion could be facilitated? Ms. Row replied that there is potential for new applications to drive such an implementation explosion in the mobility and environmental components of the program. Therefore, the Federal government role is to try to bring together enough data to make it worthwhile for application developers to invest in creative and innovative development of applications in these areas, and also to ensure that application development addresses public sector requirements.

e. ITS JPO Briefings and Group Discussion

(1) Mr. Schagrin led a presentation and group discussion of major V2V Program topics, including:

(a) The major goal of V2V is to create vehicle connectivity with DSRC.

(b) Connectivity includes all modes – cars, truck, and buses initially, but later extended to rail, motorcycles, etc.

(c) The goal is to create driver 360-degree situational awareness by allowing vehicles to see things that the driver can't see, and to reduce or eliminate crashes through driver advisories, driver warnings, and, eventually, vehicle control.

(d) Connected vehicles have the potential to address 80% of vehicle crass scenarios for unimpaired drivers.

(e) As Ms. Row stated earlier, the Connected Vehicle Program is at a critical point in transition from research to implementation. Therefore, the ITS PAC's advice on issues that the ITS JPO has not considered that might impede successful program implementation would be very constructive.

(f) Key Connected Vehicle Safety Program objectives are to support the 2013 NHTSA regulatory decision on light vehicle communications for safety, a 2014 regulatory decision on heavy vehicle communications for safety, and 2015 infrastructure implementation guidance.

(g) Remaining research in support of the 2013 NHTSA regulatory decision includes:

- Interoperability standards for data, communications, and security.

- Driver clinics to gather user acceptance data.

- A model deployment to develop safety system effectiveness data demonstrating real world operational proof.

- Device certification to ensure compliance with safety operational specifications or requirements.

- Policy implementation issues.

(h) There are two outstanding, but solvable technical issues that are still being addressed:

- Security; e.g., establishing trust relationships and credential management.

- Congestion mitigation; i.e., ensuring messages arrive when they need to.

(2) Mr. Schagrin next discussed specifics of DSRC, including:

(a) What it is: a WiFi standard adapted for a highly-mobile environment and which is relatively inexpensive to produce in quantity.

(b) How it works: messages generated ten times per second at a 300-meter line-of-sight operational range.

(c) It is necessary for crash imminent situations.

(d) Its benefits: reduced production cost and higher performance capability than other technologies currently in the market.

(e) Its drawback: both vehicles need to be equipped; however, 100% deployment will not be required to derive benefits. There will be a gradual progression of benefits as market penetration increases.

(3) Mr. Schagrin next provided an overview of the Safety Pilot Program.

(a) The Program goal is to obtain user acceptance data on safety applications based on V2V and V2I communications systems. The program has two components: driver clinics and a model deployment.

(b) Driver vehicle interfaces include audible, visual, and haptic warnings, and sometimes a combination of these.

(c) Driver clinics were conducted at six sites nationwide to gauge different driver preferences.

(d) The model deployment that will be conducted at Ann Arbor, Michigan in August 2012, will include about 3,000 vehicles, including cars, trucks, and buses with integrated, aftermarket, or retrofitted devices; 75 miles of instrumented roadways; and one year of data collection.

(e) Data will be evaluated in parallel with the model deployment testing to support the 2013 NHTSA agency decision. The 2013 decision will consider all options from conducting additional research to regulating aspects of the Connected Vehicle environment.

(f) Scalability testing will be conducted with increasing numbers of static and moving vehicles to determine the degree of message congestion that might cause a breakdown of the communication system. The scalability testing will include employment of congestion mitigation techniques.

(g) Mr. Schagrin concluded by stating that driver clinic performance testing was conducted in the varied environments of freeways with open skies, major throughways, local roads with tree cover, in urban "canyons," and in mountainous terrain.

(4) Ms. Briggs led a discussion of Connected Vehicle Program security.

(a) Ms. Briggs stated that security is the Connected Vehicle Program's major public policy challenge.

(b) Connected Vehicle Program security goals are trust, message validity, protection against attacks, appropriate user privacy, and an implementable system.

(c) Security experts and automobile manufacturers have determined that the best approach to implementing a security system is through a Public Key Infrastructure System, which involves a secret code and certificates based on some aspect of that code that are exchanged among vehicles so they can identify the other trusted vehicles.

(d) The security system would include:

- A network to communicate certificates to vehicles.

- A back office function (Certificate Management Entity) to manage the operational functions that apply across any type of security network.

- Applications infrastructure specifically for V2I safety (DSRC) or V2I mobility.

(e) Ms. Briggs described specific Connected Vehicle security system communication needs, media options for those needs (primarily cellular, WiFi, and DSRC), and various scenarios being considered to combine communications capabilities to suit various needs.

(f) Ms. Briggs concluded with a summary of major ongoing security system research activities.

(5) Mr. Cronin led a discussion on V2I safety, mobility, weather, and environment program elements.

(a) Mr. Cronin began with a brief discussion of the major benefits that can accrue from V2I applications for safety, mobility, weather, and the environment.

(b) Mr. Cronin also addressed the key V2I research program assumptions and questions.

(c) Mr. Cronin summarized the key questions being addressed by V2I research:

- For safety applications:

    – What DSRC-specific applications are most valuable? What are the benefits?

> – How will we cost-effectively obtain absolute positioning?
>
> – How/when might equipment installation occur?
>
> – What information do decision makers need to invest in DSRC infrastructure?

- For mobility, weather, and environmental applications:

  > – What specific data elements are needed?
  >
  > – How often are these data elements needed?
  >
  > – What are the benefits of the applications?
  >
  > – How will the data be obtained; i.e., with equipment installation or purchase from data aggregator?
  >
  > – What new opportunities are there with cellular technology?

(d) Mr. Schagrin also addressed the "timing" issue. The current Connected Vehicle research planning cycle projects that prototyping of V2I safety and mobility applications will be conducted in the 2014 time frame. However, these applications will not have been operationally tested. Therefore, if, as the Vehicle Infrastructure Integration Consortium (VIIC) projects, vehicles produced in the 2018-to-2020 time frame will include advanced safety devices and systems, will there be a need for additional operational testing (a "Safety Pilot II") of V2I safety and mobility applications to ensure adequate infrastructure is in place when these vehicles come off the assembly line.

(e) Mr. Schagrin concluded his remarks by reinforcing an earlier point that the ITS JPO is working closely with the several V2V and V2I test beds, with focus on ensuring technology interoperability.

f. Implementation Approach Discussion

(1) Ms. Row recommended that, in the interest of time, the committee skip the "U.S. DOT Principles" agenda topic, since this subject is adequately addressed in the document titled, "Principles for a Connected Vehicle Environment: Discussion Document," which was included in the meeting read-ahead materials.

(2) Mr. Briggs began the Implementation Approach discussion by addressing the following major questions relevant to Connected Vehicle implementation models:

(a) What is necessary to get started?

(b) How will the program manage possible transitions?

(c) What is the role/value of the private sector?

(d) What kind of partnership models are possible?

(3) The following factors are critical in considering potential implementation models:

(a) U.S. DOT's first priority is to enable crash avoidance safety applications.

(b) A mandated system:

- Would have no "opt-in."

- Would have no user choice or ability to disable.

- Would have no optional subscription fees (for core safety features).

- Would need adequate protections for privacy and non-traceability for trips.

(c) A controlled environment is necessary for systems that interface with vehicle electronics.

(d) Message validity is important for safety applications and requires a security system (network and back end processes).

(e) The security network may be based on DSRC, cellular networks, or hybrids of DSRC, cellular, and WiFi.

(4) The degree of U.S. DOT regulatory authority is relevant to the consideration Connected Vehicle implementation options.

(a) U.S. DOT has sufficient current legal authority to regulate or otherwise support many critical aspects of the Connected Vehicle environment, including equipment in new vehicles, aftermarket devices, and the security system.

(b) U.S. DOT does not have legal authority to require States (or others) to install infrastructure.

(5) The potential business models are private or public/private. Fully public models are unlikely given current funding constraints and the trend toward more private sector transportation funding.

(6) U.S. DOT is working with automobile manufacturers and security experts on simplifying the Connected Vehicle environment security structure to accelerate implementation.

(7) Finally, Ms. Briggs stated that an important factor in considering Connected Vehicle implementation models is whether or not there will be a transition from an initial model to an end state? What will the end state look like, and what, if any, will be the role of public infrastructure; e.g., DSRC?

g. Committee Focus Discussion

(1) Mr. Denaro moderated a group discussion to identify focus areas for the committee's deliberations. The discussion produced the following focus areas:

    a. Security Framework.

    b. Market Driven Adoption Strategy.

    c. Outreach Communications/Promotion Plan.

    d. Standards Harmonization.

    e. Technology Review.

(2) Mr. Denaro stated that he would send an email to the committee requesting that the subcommittees:

    a. Confirm their subcommittee titles.

    b. Develop a subcommittee charge.

    c. Describe the process for accomplishing their charge.

    d. Identify requirements for outside help.

h. Committee Organization Discussion

Mr. Denaro next moderated a discussion on the organization of subcommittees to address the selected focus topics. Based on group discussion, the following subcommittee structure was developed:

(1) Security Framework Subcommittee: Mr. McCormick (lead), Mr. Capp, Mr. Berg, Dr. Rajkumar, Mr. Schromsky, Mr. Steenman

(2) Market Driven Adoption Strategy Subcommittee: Dr. Klein (lead), Mr. Albert, Mr. McCormick

(3) Outreach Communications/Promotion Plan Subcommittee: Mr. Steudle (lead), Dr. Adams, Ms. Hammond, Mr. Holtzman, Mr. Kissinger, Mr. Webb

(4) Standards Harmonization Subcommittee: Mr. Belcher (lead), Mr. Kenner

(5) Technology Review Subcommittee: Mr. Denaro (lead)

i. Future Meeting Discussion

(1) Mr. Denaro moderated a discussion of options for the committee's future meetings.

(2) There was general consensus that the next meeting would be hosted by Mr. Steudle at Ann Arbor, MI in early October, preferably before October 15, with the option of holding meetings by teleconference or web conference before then. The ITS JPO will send the ITS PAC an email with a Doodle® poll of October meeting date options.

(3) Mr. Denaro invited Mr. Winfree and Ms. Row to make final comments. Mr. Winfree encouraged committee members to "think outside the box" during their deliberations and again thanked them for their time, attention, and service.

j. Adjourn

Mr. Denaro adjourned the meeting at 4:01 p.m.

We hereby certify, to the best of our knowledge, that the foregoing minutes are accurate and complete.

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