Photo Source: Thinkstock

U.S.-JAPAN EVALUATION TOOLS AND METHODS

Introduction

Cooperative systems based on intelligent transportation system (ITS) technologies can deliver significant benefits for all road users and the public, especially in terms of safer, more energy-efficient, and environmentally friendly surface transportation. Through a wireless communications network, a cooperative system enables cars, buses, trucks, and other vehicles to "talk" to each other and to roadside infrastructure, cell phones, and other devices, exchanging valuable safety, mobility, and environmental information. The U.S. Department of Transportation (USDOT) Research and Innovative Technology Administration and the Road Bureau of the Ministry of Land, Infrastructure, Transport and Tourism of Japan (MLIT) are working together to foster research, development, and deployment of such a system of communicating vehicles and roadside in both countries.

The USDOT and MLIT have a long history of sharing information on ITS activities, including an annual U.S.-Japan ITS Workshop held in conjunction with the ITS World Congress. Building on this relationship, the USDOT and the MLIT signed a Memorandum of Cooperation in 2010 to promote bilateral collaboration in the field of ITS, especially cooperative systems. This Memorandum aims to enhance cooperation between both agencies and further the development and implementation of global ITS activities.

Collaborative Research

The agencies formed a U.S.-Japan ITS Task Force to exchange information and identify the areas for collaborative research to foster the development and deployment of ITS in both the United States and Japan. The task force identified the following four high-priority areas:

1. International Standards
2. Evaluation Tools and Methods
3. Probe Data
4. Automation in Road Transport.

Objectives

The objectives of the U.S. and Japan bilateral collaboration are to:

- Identify research and development areas that would benefit from joint development
- Share information on ongoing research and development projects, estimated benefits, research outcomes, and field demonstration results
- Inform stakeholders involved in the development of cooperative systems, based on ITS technology, about continuing cooperation and progress between the countries and promote active participation and exchange among stakeholders by jointly organizing symposiums, seminars, and meetings
- Support development of global, open standards that ensure interoperability; globally harmonized standards are essential to support and accelerate the deployment and adoption of cooperative systems based on ITS technologies.

Purpose

As part of the collaborative efforts to promote research, development, and deployment of cooperative systems, the U.S.-Japan ITS Task Force will:

- Share case studies of evaluation methods, including performance indicators, and measurement methods used to assess the performance and cost-benefit of ITS and cooperative systems in the United States and Japan
- Develop a common glossary of terms for use in the United States and Japan
- Compare and assess existing evaluation methods used for ITS and cooperative systems in the United States and Japan
- Develop consistent categorization and organization of performance indicators and measurement methods
- Work toward a consistent methodology to evaluate the performance and cost-benefit of cooperative systems and applications.

U.S. Department of Transportation

National Institute for Land and Infrastructure Management

Ministry of Land, Infrastructure, Transport and Tourism

Road Bureau

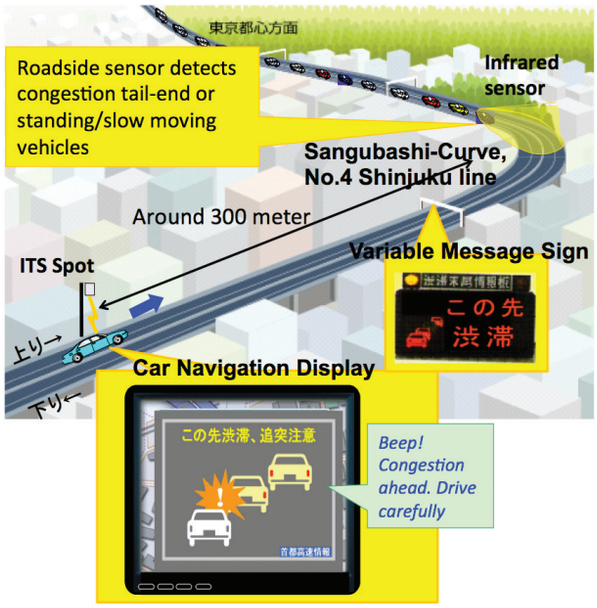
Collaborative Research: Evaluation Tools and Methods

The USDOT and MLIT are promoting research and development of cooperative systems in their respective countries. To do this, it is essential to demonstrate the value of these systems. Although methods and tools have been developed for evaluating ITS, no common methodology is applied consistently across evaluation efforts within the United States or within Japan. In addition, evaluation terminologies are used inconsistently, with each effort developing its own definitions. Finally, methods for measuring and monetizing benefits are inconsistent. Thus, although ITS evaluations have been conducted since the deployment of such systems, there is no common approach to evaluating ITS even within each country. This makes it difficult to compare systems with diverse capabilities deployed in various parts of the nation, resulting in lack of confidence among public and private sector stakeholders in the systems' results or demonstrated value. At this stage, it is unknown whether evaluation methodologies for ITS and cooperative systems will differ since evaluation of cooperative systems is in its infancy. This research effort should help in identifying whether there is a need for new evaluation methodologies for cooperative systems or whether existing ITS evaluation methodologies will suffice.

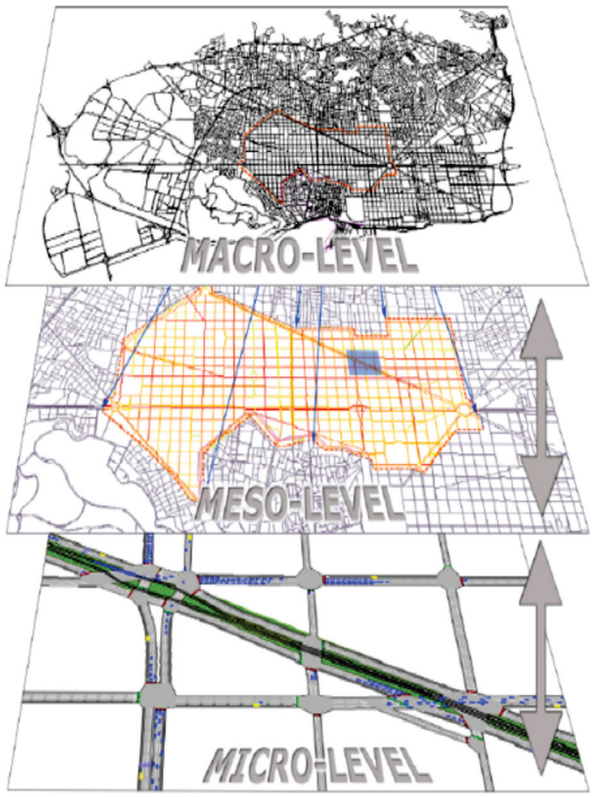
Outcomes

The expected outcomes of the activity include:

- Increased understanding of existing evaluation methods, performance indicators, and measurement methods used in the United States and Japan, and their applicability for testing cooperative systems and applications
- Insight into challenges and issues with different types of evaluation methods
- Reduced cost for testing of cooperative systems and applications through shared experiences and lessons learned
- Ease in comparing the impacts of cooperative systems through the exchange of information on indicators and measurement methods
- Increased stakeholder confidence in evaluation findings through development of consistent evaluation methodology
- Jointly develop a report detailing the Task Force's collaborative research on evaluation tools and methods, to be published in 2014.



Sangubashi Curve Project (Providing Information on Obstacles Ahead)
(Source: Ministry of Land, Infrastructure, Transport and Tourism, 2013)



Geographical Scope in Existing Traffic Analysis Tools
(Source: Cambridge Systematics (for USDOT), Integrated Corridor Management Analysis, Modeling and Simulation Methodology, 2008)

For more information about this initiative, please contact:

Dale Thompson, Program Manager, Connected Vehicle Data and Weather Programs
Research and Innovative Technology Administration
ITS Joint Program Office | (202) 493-0259
dale.thompson@dot.gov | www.its.dot.gov

Koichi Sakai, Senior Researcher, Intelligent Transport System Division
National Institute for Land and Infrastructure Management,
Ministry of Land, Infrastructure, Transport and Tourism
+81-29-864-4496
sakai-k92tb@nilim.go.jp