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## Report on the “Performance Management” Workshops in Japan

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February 2006

During November 2005, the Japanese Ministry of Land, Infrastructure and Transport (MLIT) organized a series of meetings among highway agency representatives from the U.S., U.K., and Japan. The purpose of the meetings was to discuss how performance measurement information is being used to achieve policy goals and improve internal management practices in their respective agencies. Dr. Tony Kane of AASHTO, Ms. Daniela Bremmer of the Washington State DOT, and Dr. Woody Stanley of the Federal Highway Administration represented U.S. agencies at the workshop. The schedule of meetings, which were held in the Tokyo metropolitan area, was as follows.

U.S.-Japan Workshop – U.S. agency officials met with the Deputy Director-General and Division Directors at the MLIT Road Bureau on November 15 to discuss highway finance practices, the use of outcome performance measures, and the privatization of Japan’s toll expressways.



U.S. – Japan Workshop

U.S.-U.K.-Japan Workshop – On November 16, U.S. Agency officials and U.K. Highways Agency representatives met with members of the Infrastructure Planning Committee of the Japan Society of Civil Engineers (JSCE) to discuss the use of performance measurement information at the headquarters and field (i.e., state or regional) level. In an afternoon session attended by an audience of approximately 140 Japanese representatives from universities, consulting firms, and government agencies, the invited speakers from the U.S., U.K., and Japan provided an overview of recent performance management trends in each of the participating countries.

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Site Visits to Metropolitan Expressway Company (MEC) and the Vehicle Information and Communication Systems Center (VICS) - On November 15, U.S. agency officials visited the MEC Traffic Control Center. The MEC maintains and operates approximately 40% of the total length of the current Tokyo expressway system. We also toured the VICS, a non-profit organization supported by the MLIT, other government agencies, and an industry consortium, that processes and disseminates real-time traffic information throughout Japan.



MEC Traffic Control Center

Site Visit to MLIT Kanto Regional Bureau – U.S. agency officials visited the Kanto Regional Office on November 17 to learn more about how performance measurement information is influencing management practices in the Road Bureau. This region, which includes Tokyo, accounts for about 17% of the total length of roads and 27% of all traffic volume in Japan.



Meeting at the Kanto Regional Bureau.

In the following paragraphs, I summarize what we learned about developments in Japan from the workshop presentations and the discussions with the staff from the Japanese Road Bureau.

### Highway Finance

Since the mid-1950s, the Japanese have funded highway improvements through a combination of gas tax revenues (i.e., provisional rate of 48.6 Yen/liter or \$1.60/gallon) and other national and local use taxes such as a local gas oil delivery tax. The current 5-Year Road Improvement Program, endorsed by the Prime Minister's Cabinet in 2003, sets expenditures at 38 Trillion Yen, or about \$330 Billion, over this period with 9.3 Trillion, or about \$81 Billion, allocated in FY 2005. This ambitious spending program seeks to significantly expand capacity throughout the country including the completion of a ring road (i.e., a beltway) around Tokyo. However, some of the tax revenues are no longer specifically earmarked, or "walled-off," for highway and transportation improvements. The Road Bureau must compete with other Federal government programs for the funds. Under the current political administration, they have come under increasing political pressure to reform operating practices and reduce budgets. They have also encountered opposition to their plans from communities and environmental groups.

### Privatization of Toll Roads

In October, the Road Bureau reorganized four existing organizations into six expressway companies servicing approximately 14,000 km of high-standard toll roads. While the Road Bureau will continue to license and approve all construction and improvement projects, this arrangement gives the private companies authority to manage the existing toll roads and complete the ring road network around Tokyo and other routes throughout the country. The Japan Expressway Holding and Debt Repayment Agency (JEHDRA) has been created to hold the initial debt of about Yen 40 Trillion, which will be repaid over a 45 year period by the expressway companies. The objective of this privatization effort is to further reduce operating costs and provide a profit incentive to the operators of the expressways. Management and maintenance costs were reduced by 30 percent in the four years preceding privatization. But, the Road Bureau hopes to reduce operating costs further and generate more toll revenue on the expressways. The private companies plan to increase throughput and revenue using off-peak hour discounts, lower operating costs by increasing the use of electronic toll collection, and realize profits from managing the roadside concessions. This approach was deemed necessary for the expressway companies to continue to expand and build new sections of the highway system, particularly in areas where construction costs are expected to be much higher than what has been incurred to date.

Use of the expressway toll roads amounted to only 13% of the total vehicle-kilometers on all roads in 2004. This is primarily due to high user fares; but, also due to high levels of recurring traffic congestion that force closure of sections of the expressways periodically in some areas of Tokyo. Approximately 85% of traffic congestion on the expressways is from recurring causes. The Road Bureau has had some success increasing the volume of

travel on these roads by lowering tolls in off-peak hours and encouraging real-time congestion management practices. The newly-privatized expressway companies are expected to continue these practices and have adopted a number of performance measures to monitor their progress, such as ETC usage, time loss due to congestion, road construction work time, traffic fatality rate, hours of service, and road user satisfaction.

### Performance Management

With the assistance of the National Institute for Land and Infrastructure Management (NLIM), a separate office within the MLIT that is responsible for policy development and research, the Road Bureau adopted an outcome-based performance management process in 2003. The agency instituted an annual management cycle that includes the development of an annual plan and achievement report. They have also taken the first steps towards linking outcomes to the operating budget. The annual performance plan includes 7 policy themes or goals with 17 associated outcome measures:

- Reducing traffic congestion
- Improving the environment
- Reducing traffic accidents
- Linking regions
- Preparing against disasters
- Improving regional attractiveness
- Reforming road administration

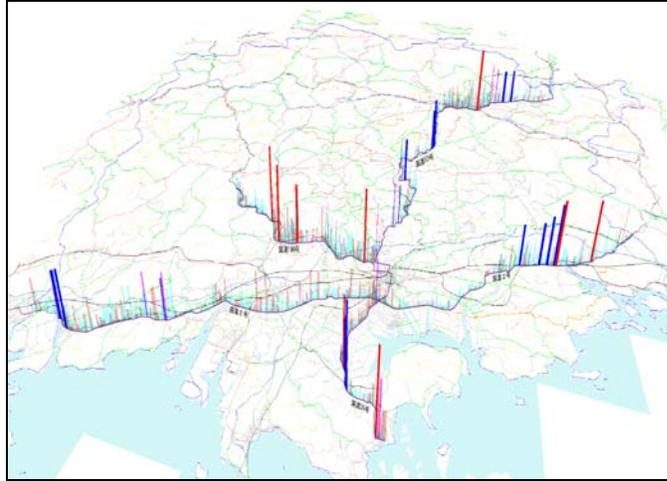
Their initial efforts have focused on reforming the road administration practices by adopting a more user-oriented focus. One initiative is the introduction of an “unpopularity vote” polling program in Tokyo’s 23 wards to measure driver dissatisfaction and direct work zone construction activities in order to reduce the hours of roadwork.

They have also refined the methods they use to analyze traffic information and data from major roadways and expressways in order to produce extensive sets of “3D” graphs of traffic conditions. Several examples are provided on the next page. They use this traffic information for a variety of purpose such as before-after assessments of project improvements. For example, at the Kanto Regional Bureau, before-and-after studies using the data showed that that the recent opening of a section of a ring road (i.e., Route 2 Oji-section) in the Tokyo area resulted in reductions in congestion and fatal traffic accidents on nearby local roads.

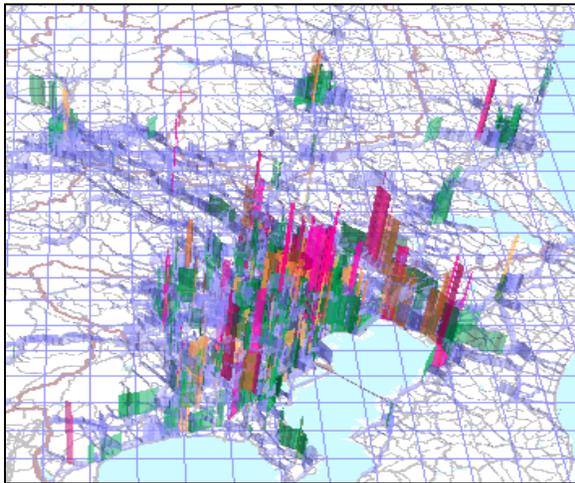
The agency is exploring new approaches to project selection based on the use of performance measure information for traffic safety and congestion. At Kanto, they fund improvements through a review of the top 20 percent of locations that have the highest fatality rates and worst congestion levels using a Pareto-type analysis of this traffic information. They also recognize that they must do a better job explaining the need and benefits of planned highway improvements. They are developing visual aids, such as maps that show the “Top 10” bottlenecks or hot spots, to explain to the public the need

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for system improvements. They believe that their ability to obtain traffic data on a more frequent basis has been the key to undertaking these types of analyses, as these target locations could not have been easily identified through annual or monthly time-series analyses.



Map depicting the ratio of fatalities and injuries in the Okayama Prefecture.

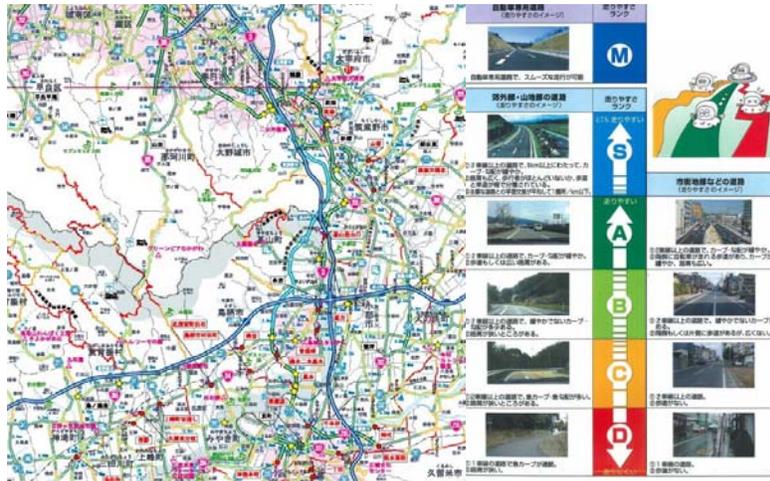


Two examples of the type of 3-D graphs used to portray time loss due to congestion (Kanto and Okayama Regions).

Road agencies in 41 of 47 prefectures in Japan have also begun to adopt outcome-based performance measures. Many of the measures are the same as in the National plan, but more than half are unique to each area. For example, the Niigata prefecture has adopted 11 indices including unique measures such as the rate of snow removal on sidewalks.

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The lack of available traffic data in smaller metropolitan areas and in rural areas is a challenge. In a few instances, probe cars and buses equipped with GPS are being employed to monitor travel times. Using performance information to communicate with the public is also a high priority. In the Kyushu prefecture, a “comfort driving” map has been produced that rates conditions (i.e., infrastructure, safety, and number of lanes) on all routes using a color-coded scheme – see map on the next page. The intent is to inform drivers and encourage them to utilize safer and less-congested routes.



Example of a Comfort Driving map for the Kyushu Region.

### Traffic Information Systems

The MEC/VICS are examples of how public and private investments in ITS infrastructure complement other reform programs such as privatization of expressways; all with the goal to manage and reduce traffic congestion and improve traffic safety. The Road Bureau has set a FY 2007 target to reduce the time loss due to traffic congestion by 10% from FY 2002 levels, or 3.81 billion person-hours nationwide. In addition to adding capacity and introducing other operational improvements, the availability of the traffic information makes it more likely that individual drivers can manage their travel to minimize time loss and avoid crash events. At the same time, the Road Bureau and other agencies have access to the necessary real-time data they need to begin to assess and demonstrate the benefits of both operating and capital improvements.

In the mid-1990s, a consortium of Japanese government agencies including MLIT expanded efforts to develop and utilize traffic control systems on the expressways and main trunk roads in the Tokyo metropolitan area. A system of ultrasonic vehicle detectors placed at 300 m intervals and closed circuit cameras was installed on the expressways to transmit information (i.e., every minute) to the Traffic Control Centers operated by the MEC. This information, coupled with reports provided from patrol cars and emergency phones, is used by the MEC for traffic incident management purposes.

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The visual and text information is also broadcast to a variety of variable message signs and information boards along the roadway to provide drivers with up to date information about traffic conditions. Congested roadway segments, defined as when travel speeds equal 20 km/hr or less, are identified on graphic information boards. A similar system was installed on major trunk roads.



The variable message sign (at the top right) describes the traffic conditions on the roads connecting at this expressway junction.



This graphic information board on the expressway depicts congested areas (red lines), current accidents (blinking light), and closed sections (lighted).

With an investment of about 2 Billion Yen, or \$17 Million, the VICS collects and processes this data from the MEC and other providers, which it transmits to drivers with in-vehicle navigation systems on expressways and trunk roads via radio wave and infrared beacons and to a wider area including parking lot locations via FM multiplex.

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Vehicle and equipment manufacturers, plus private contributors, fund the VICS based on the sales of in-car navigation units that receive this information. At present, car navigations systems are used in approximately 13 million vehicles, or about 17% of the vehicles in Japan. The VICS consortium of service providers has developed standards and common map formats that facilitate widespread use of the information. The MLIT has ambitious plans to expand the reach of this system beyond the Tokyo metropolitan area depending on data availability, include active traffic safety information in the displays, integrate this technology with the ETC on-board systems; and, to convert their radio frequency communication system to 5.9GHZ in 2006----the same frequency the US is using in its VII (Vehicle Infrastructure Integration) initiative.



VICS Center Control Room.

### Closing Comments

In all three countries, both at the Federal and State level, we continue to examine how to best use performance measures and the resulting information to better communicate our mission to legislators and the public, focus our efforts and improve managerial accountability in our internal operations, and justify or more effectively use available resources. From these discussions, I found that we face many similar challenges; not surprisingly, we have adopted many of the same goals and objectives. Addressing traffic congestion and safety are at the top of the list, but there are many other areas where we can learn from each other. Some possible areas of sharing and cooperation include:

- Traffic data analyses methods and techniques, including data mapping
- Approaches to regional transportation planning
- Project evaluation and selection
- Performance budgeting practices

At the end of the week, we agreed to continue these discussions in future workshops.