Intelligence on the Road

Japan is introducing ITS (Intelligent Transport Systems) to improve safety for road traffic, conserve the environment and upgrade mobility. *The Japan Journal*'s Osamu Sawaji reports.

In Japan, as of FY 2010, about 20% of all carbon dioxide (CO_2) emissions come from the transportation sector and, of those, about 90% are emissions from automobiles. In order to reduce CO_2 emissions from automobiles, in addition to the diffusion of electric vehicles, plug-in hybrid vehicles and other eco-cars, the introduction of ITS is progressing.

ITS are systems for resolving transport issues such as accidents and traffic jams by sending and receiving information between the driver, the road and the vehicle. Examples include car navigation, employing in-car instruments that give directions; ETC (Electronic Toll Collections), a system allowing for automatic drive-through payment at tollbooths; and VICS (Vehicle Information Communication System). If traffic jams can be reduced by using ITS, then CO_2 emissions can also be reduced.

Since the 1990s, through the diffusion of ITS, Japan has managed to reduce traffic congestion and CO_2 emissions. Japan began full-scale ETC operations starting in 2001; today, 87% of tolls are paid using ETC, with some 6.5 million vehicles being fitted with the devices. As a result, there has been a big reduction in traffic congestion at tollbooths, which still accounts for about 20% of all traffic congestion on Japan's highways, and this has had the effect of reducing annual CO_2 emissions by 210,000 tons.

In addition, starting in March 2011, a nationwide "ITS Spot" service began. ITS Spots have been installed in 1,600 locations nationwide and, through high-speed, large volume communication, a wider range and more detailed transport information can be transmitted to a moving vehicle than was possible before. For example, if something falls off of a truck, information about an obstacle on the road can be sent a kilometer before the driver reaches it. Further, by displaying still pictures of the road ahead in the direction of travel, drivers can comprehend traffic congestion, snow accumulation, or other adverse road conditions ahead of time. Just before the curve where the most accidents occur on the Metropolitan Expressway that runs through Tokyo, ITS Spot transmits alerts, an initiative which has reduced accidents by about 60%. Japan is the most advanced country in the world where the practical application of ITS allows drivers to receive such diverse information.

ITS are also useful during natural disasters. In the Great East Japan Earthquake in March of last year, ITS Japan, an NPO which works to disseminate ITS, published map information, in cooperation with automobile makers and the Geospatial Information Authority of Japan, which showed at a glance which roads in the Tohoku region had traffic records and which roads were closed, which was a big help to rescue operations and to the transport of goods. It is thought this was the first time in the world that ITS had been used over such a wide area during a natural disaster. Caution and warning information was also sent from an ITS Spot on the Metropolitan Expressway immediately after the earthquake.

Japan is deploying this ITS technology overseas as well. For example, ITS Japan and private sector companies in the ITS business have provided ITS tech-

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1,600 ITS Spot Units (1) have been installed on Japanese expressways. ITS Spot Service-equipped car navigation systems (2) automatically receive information such as the presence of obstacles on the road or congestion (3) and communicate it to the driver using real-time images (4).

nology support to China. Starting in 2008, transport information services started in four major cities, including Beijing and Shanghai and these have since spread to sixteen cities. In addition, the Japan International Cooperation Agency (JICA) is providing support for the introduction of ETC and other ITS in the central southern Indian city of Hyderabad.

In October of next year, the 20th ITS World Congress will open in Tokyo, the third time that Japan will host the Congress. The theme of this Congress is "Open ITS to the Next" and 8,000 participants from sixty countries are expected to attend. One of the main programs is expected to be, using the Great East Japan Earthquake as a lesson, how ITS can be used to construct resilient transportation systems. HJ