A Case of Utilizing Results

Revising ITS Spot Technical Specifications, and Expanding them to Ordinary Roads Throughout Japan

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1. Introduction

In FY 2011, about 1,600 ITS Spots (road side devices for radio communication in the 5.8GHz frequency band) installed on expressways throughout Japan by the Ministry of Land, Infrastructure and Transport and Tourism were surveyed and studied by the National Institute for Land and Infrastructure Management (below,"NILIM") to provide and improve the ITS Spot services. And as a summary of the findings, the NILIM revised the Specifications (Draft) for Spot Communication Services (DSRC (Dedicated Short Range Communication) services) (Below, "the Specifications (Draft)).

This is a report on the revision of the Specifications (Draft) done so that when services using route information, which the Ministry of Land, Infrastructure, Transport and Tourism is now promoting, are implemented and when ITS Spots are installed at about 1,500 locations on ordinary roads, the services will be implemented smoothly and the installed equipment will be adapted to conditions on ordinary roads.

## 2. Outline of services that use route information

Services that use route information is a concept that will result in effective use of overall road networks in the future, because in large cities, the construction or ring roads is sharply increasing the range of route selections, and ETC2.0 and ITS Spots that gather and aggregate route information will permit preferential measures for drivers who select routes intelligently according to congestion, accidents, and other conditions.

3. Outline of the revision of the Specification (Draft)

It is necessary to appropriately clarify the routes that vehicles travel to operate ETC2.0 services etc. so ITS Spots must provide highly reliable communications. Therefore, it will be essential to quickly detect and repair roadside equipment that is damaged or malfunctions.

Under such circumstances, in addition to collecting probe data (traveling history, behavior history and similar data) as done until now, collecting ASL-ID probe data (ITS Spot compatible car-mounted equipment individual number data) was incorporated into the Specifications for ITS Spots newly installed in FY2014 (a total of about

Figure 1   Services that utilize route information
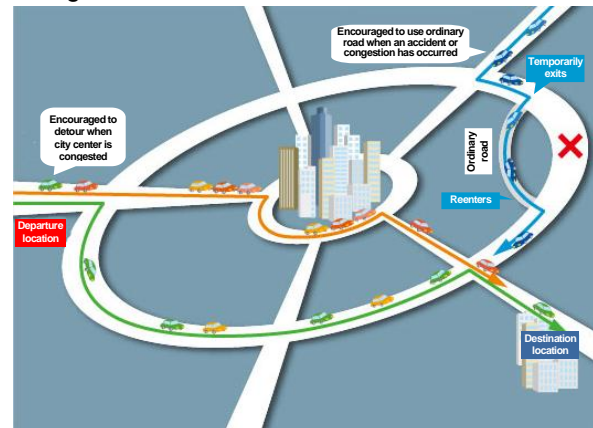
1,500 at major points on ordinary roads nationwide).

ASL-ID probe data is data collected shortly after the start of communication, and which is characterized by small data volume, so it permits the collection of data relatively stably, even when the car equipped with the car-mounted equipment passes an ITS Spot's communication area at a speed of several tens of kilometers per hour. Therefore, by calculating the reception rate of probe data with the number of these data received as the denominator and the number of probe data received as the enumerator, it is possible to detect roadside devices that may be damaged or malfunctioning.

And when installing ITS Spots on ordinary roads, incorporating the definition of communication area where communication is possible with one ITS Spot on each of the inbound and outbound lanes of a 2-lane 2-way road, is counted on to increase the variation of installations of ITS Spots on ordinary roads and to help lower costs because a small number of ITS Spots will be able to communicate over a wide area.

4. In Conclusion

Based on the newly revised Specifications (Draft) 1,500 ITS Spots will be newly installed on ordinary roads in FY2014, and functions specified in the revisions to the Specifications (Draft) will be gradually added to the 1,600 ITS Spots already installed in expressways. In the

future, based on knowledge obtained through operations in the field, a study will be done to further expand ETC2.0.