Establishment of the environment for technical measures for the operation of ITS Spot services

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1. Introduction

ITS Spot services were launched nationwide in March 2011. About 1,600 ITS Spots are installed, mainly on expressways, providing wide area road traffic information and safety driving assist and other services. It is expected that compatible OBUs (On-Board Units) will be installed in about 10 million vehicles during the next five years.

The ITS Division of the NILIM has established the Operating Technique Working Group to ensure the smooth operation of ITS Spot services. Specializing in technical aspects of the operation of ITS Spots, it clarifies challenges etc. and solves various problems. Besides that, the Division built a test course at the NILIM, and technically makes the causes obvious and evaluates the effects of countermeasures. Its members include the ITS Program and Policy Office of the Road Bureau, Regional Development Bureaus, and highway companies, plus private sector OBU makers, and RSU (Road Side Unit) makers, and it has been held about every three months since June 2010. This paper reports the studies at the Operating Technique Working Group.

2. Technical measures

In 2010, to start nationwide services at the end of the year, it studied methods to conduct connection tests, harmonizing technical standards and services.

In 2011, after the start of nationwide services, it took various measures for errors and problems which appeared immediately after the startup. The important measures are reported as below.

(i) Countermeasures against defects which appeared after the launch

Highway companies and Regional Development Bureaus reported results and problems with interoperability among various RSU and OBU makers at the working group in April 2011. Many of them were kinds of errors fixed separately, such as “inability to make communications” or “failure to output voice information” in some combinations of RSUs and OBUs due to the combination of different makers. Especially in the case of RSU, which frequently cause errors or other problems, OBUs specially designed to check and analyze were used to record data-log and clarified. The initial problems were almost all resolved by these activities.

(ii) Arrangement of standards for maintenance of ITS Spot equipment

The working group defined the inspection items and inspection cycle needed for each type of equipment. It has set inspection standards not only for ITS Spots, but for servers and other center side equipment.

(iii) Building the NILIM Test Course

The test environment on the testing track at the NILIM was built in order to provide an actual environment which enables us to take measures for errors caused by combinations of RSU and OBU made by different makers, and to perform interoperability tests when new functions are added or software is upgraded.

Roadside equipment made by six makers operating on expressways was installed on the test course, so that test vehicles equipped with OBUs can be tested on the test course. It has the following beneficial characteristics.

- Two-way communication testing between equipment from all makers can be done.
- An actual environment can be reproduced (traveling speed, communication with multiple vehicles, etc.)
- Testing can be done efficiently and rapidly.

The installation of RSU was completed in November 2011, and the working group members performed tests in order to technically evaluate causes of problems and countermeasures.

3. Summary

The establishment of the Operating Technique Working Group and the building of the test course have created an environment allowing measurement of technical problems rapidly with ITS Spots. In the future, the working group will aim to improve the reliability of the system, operate it smoothly, deploy ITS Spot services, and contribute to safe, comfortable, and eco-friendly road traffic.