

Research Trends and Results

Next-generation cooperative services linking ITS Spots with cell phone networks

KANAZAWA Fumihiko, Head

SAWA Junbei, Senior Researcher

WATANABE Daisuke, Researcher

SANO Hisaya, Guest Research Engineer

Intelligent Transport System Division, Research Center for Advanced Information Technology

(Key words) Cooperative ITS, road – vehicle communication, vehicle – vehicle communication, smartphone

1. Introduction

The NILIM has been conducting “Joint Research on Development of Next Generation Cooperative ITS”, which is joint public-private research on next-generation cooperative ITS with 15 private sector manufacturers since 2012.

Through the joint research, a system architecture consisting of a theoretical model and a material model has been created in order to define service contents and model the system functions and information flow, in order to clarify the overall image of cooperative ITS services. Specifically, it classifies 7 major matters—support for safe driving, smoothing traffic flow, improving the environment, improving comfort, emergency response, support for administrative activities, and support for economic activities—and lists 196 proposed services.

It also studies a road map to the development of cooperative ITS and its spread inside and outside of Japan.

This paper reports on the contents of the joint research concerning services linking ITS Spots with cell phone networks using cooperative ITS technology.

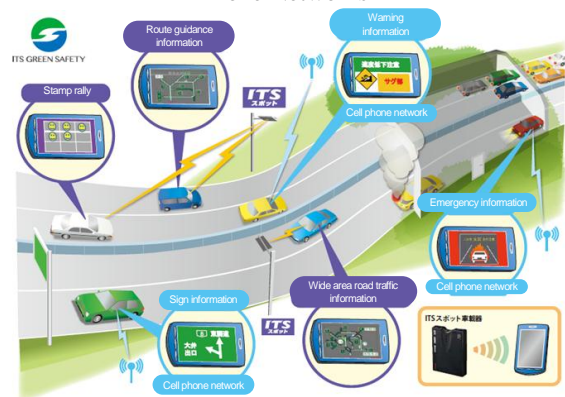
2. Outline of services linking ITS Spots with cell phone networks

“Services linking cell phone networks with ITS Spots” were jointly developed with 14 private sector companies including the expressway operators. At ITS World Congress Tokyo 2013, the showcase, “Cooperative Services of Mobile Communications and ITS Spots (12V)” was carried out, and the effectiveness of the services was surveyed.

As the showcase, participants drove from Odaiba to Umihotaru on the expressway while using smart phones to experience various services established by linking cell phone networks to ITS Spots. The following five services were newly studied.

[1] Technologies to link and complement ITS Spots or other existing infrastructure with cell phone networks were applied to continuously supply sign information, landmark information etc. for display on smartphone screens along with road traffic information from ITS Spots.

Figure. Image of Services Linking ITS Spots with Cell Phone Networks



[2] In the Aqua Tunnel where GPS is blocked, using information from ITS Spots installed in the tunnel in addition to sensor information, obtainable by smart phones and base station information about cell phone networks, clarified position information about traveling location more accurately.

[3] Real-time information provision in four languages (Japanese, English, Chinese, and Korean) using a function which supplies information to smartphones from the cell phone network was demonstrated.

[4] When starting to drive, the driver’s smartphone and the smartphones of the passengers were grouped so that while driving, information the driver received from the cell phone network and from ITS Spots was also displayed on the passengers’ smartphones to share the state of traffic surrounding the automobile.

[5] Recording the automobile passing each ITS Spot installed on the way to the destination to confirm the automobile is traveling on the predetermined route was demonstrated.

The results of a survey of the effectiveness of the services show that concerning the early practical introduction of the services, 30% of the respondents answered “strongly desirable” and 60% answered “desirable if possible”. And concerning their intention to use the services, about 90% of them answered, “I want to use them”, so it can be concluded that desire to use the services is strong.

3. Conclusions

In the future, we will continue studies based on knowledge obtained from the results of the showcase, to effectively operate services to begin their actual operation.

[Sources]

Twentieth ITS World Congress Tokyo 2013, Showcase
GS: Mobile Communications – ITS Spots Cooperative
Services (12V) Pamphlet