TMC Develops Navigation System Compatible with Vehicle-Infrastructure Cooperative Safety System

Toyota City, Japan, June 29, 2011—Toyota Motor Corporation (TMC), aiming to reduce traffic accidents through the use of Intelligent Transport Systems (ITS), has developed an onboard navigation system compatible with the vehicle-infrastructure cooperative Driving Safety Support System (DSSS) scheduled for launch by the Japanese National Police Agency in Japan in July.

The new navigation system is representative of TMC's work in the area of safety technology and vehicle development carried out under its Integrated Safety Management Concept. TMC is developing individual onboard safety devices and systems while promoting the development of vehicle-infrastructure cooperative systems that enable information exchanges among different vehicles and the traffic infrastructure.

The five main features of the new system, which provides timely audio and visual warnings and notifications to drivers, are:
1) "Red light" warning
2) "Stop sign" warning
3) "Stationary vehicle ahead" notification
4) "Blind corner vehicle presence" notification
5) "Green light" advance notification (reduces traffic congestion and emissions; first real-world implementation)

Based on its aim to produce cars that are safe, provide peace of mind and move people not only physically but also emotionally, TMC seeks the elimination of traffic fatalities and injuries, which TMC believes is the ultimate wish of any society that values mobility. By conducting a wide range of activities based on three pillars—developing safe motor vehicles, educating the public on traffic safety, and participating in traffic-environment development—TMC aims to continue contributing to the improvement of traffic safety.

Example Configuration
The car navigation system receives traffic infrastructure information from roadside infrared beacons via an onboard VICS beacon unit. The navigation uses this information in conjunction with real-time vehicle information such as speed and accelerator pedal position to support safe driving by giving audio and visual warnings when appropriate.

Driving Safety Support System (DSSS) Outline

1) "Red light" warning
   Signal information is sent to the vehicle from roadside infrared beacons. A warning is sent to the driver if the system detects the possibility of the vehicle running a red light.
2) "Stop sign" warning
Stop sign information is sent to the vehicle from roadside infrared beacons. A warning is sent to the driver if the system detects the possibility of the vehicle running a stop sign.

3) "Stationary vehicle ahead" notification
A DSSS sensor ahead of the vehicle gathers traffic data and sends that information via infrared beacon. Notification is given to the driver if there is a stationary or low-speed vehicle ahead.

4) "Blind corner vehicle presence" notification
A DSSS sensor ahead of the vehicle gathers traffic data and sends it via an infrared beacon on the road with the right-of-way. Notification is given to the driver if there is a vehicle around a blind corner.

5) "Green light" advance notification
A roadside infrared beacon sends traffic signal information to the vehicle. If stopped at a red light, the navigation system displays red light duration. At an appropriate time prior to the traffic light changing to green, a notification is given to the driver to check surroundings and prepare for acceleration.
1. Systems that, among other objectives, seek to prevent traffic accidents by alerting the driver to dangerous situations through provision of visual and auditory information on nearby traffic conditions, reduce environmental impact and emissions and to create a more comfortable driving environment.

2. Systems that support safe driving using information obtained from onboard radar, cameras, sensors and other devices. Relevant government agencies in cooperation with a number of companies are investigating their practical application through tests such as the ITS-Safety 2010 large-scale field operational test of 2008 (sponsored by Japan’s private-public ITS Promotion Council).

3. An approach to safety that seeks to provide the driver with comprehensive support in all aspects of driving and not focus solely on independent safety systems.

4. As of May 2011, according to TMC.

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