

Summary of SIP-ADUS project (FY2015)

Name of the project	Basic Research on Requirements for Safety and Reliability of Automated Driving System
Responsible Organization	Ministry of Land, Infrastructure, Transport and Tourism

National Traffic Safety and Environment Laboratory

Object of the Project

It is becoming an important theme to secure safety and reliability of the automated driving system. Therefore, it is considered about introducing the on-board diagnostics (OBD) and the event data recorder (EDR) as the devices for securing safety and reliability of this system. In this study, the state of the OBD and the EDR which are installed in the advanced driving assistance system (ADAS) is investigated, because the ADAS is expected to be the basic system of the automated driving system. Moreover, the comprehensive concept for introducing the OBD and the EDR in the automated driving system is proposed based on results of investigations in this study.

Project Summary

(Contents of this study)

- The investigation about the specification differences of the ADAS based on the composition differences of sensors (Target: 12 car manufacturers).
- The investigation about the state of the OBD and the EDR which are already installed in the ADAS (Target of the investigation about diagnostic trouble codes (DTC) : 27 vehicles / 8 car manufacturers).
- The review about the comprehensive concept of the OBD and the EDR in case of introducing into the automated driving system which is categorized as level 3 or level 4 based on results of above-mentioned investigations.

(Conclusions of this study)

- According to the investigation about the state of the OBD which is already installed in the ADAS, it is confirmed that many vehicles already have the function to diagnose that sensors for the ADAS cannot operate normally by not being able to be received input data normally owing to external causes (weather conditions etc.) apart from the normal diagnosis of malfunctions.
- The automated driving system which is categorized as level 4 is needed the function to always diagnose whether the system can drive safety equal with or more than the good driver. On the other hand, the automated driving system which is categorized as level 3 is needed the function to always diagnose whether the system falls into the emergency situation in which the system transfer the authority of driving to the driver because the system cannot drive owing to the function limits. There is a possibility that these diagnosis function which are needed to introduce into the automated driving system will be realized by developing the above-mentioned function of the current OBD.
- When trying to verify the adequacy of the operating state of the automated driving system in traffic accidents by using the recorded data in the current EDR, these data would be not enough to do that in terms of the record items, the record timing, the accuracy etc. It is needed to add or prepare the function which can always record the data of the vehicle behavior which should be measured to diagnose the propriety of automated driving and the image data which is recorded traffic environments outside of the vehicle synchronously in the EDR of the automated driving vehicle.

Future plan