

# Summary of SIP-adus Project (FY2017)

<b>Name of the project</b>	Formulation of communication requirements for wireless communication for automated driving
<b>Responsible Organization</b>	Oki Electric Industry Co., Ltd.

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## Object of the Project

In Japan, some examinations of the ITS (V2V, V2I, etc.) wireless communication method for supporting the automated driving system have been proceeding in reference to use cases utilizing the wireless communication considered in the Japan Automobile Manufacturers Association (JAMA). In order to really apply these ITS wireless communication technologies, it is necessary to set communication requirements corresponding to each use case and formulate message-set and protocol specifications of the wireless communication for automated driving, after having made a target level of automated driving clear.

This project examines the requirement, message-set and protocol of the wireless communication for automated driving, in reference to outcomes of the past SIP-adus project, the examination situations in the JAMA and the associated specifications both inside and outside Japan. Furthermore, a draft protocol specification of the wireless communication for automated driving is prepared to formulate the experimental guideline.

## Project Summary

### Examination of communication requirement

- Investigate and discuss the JAMA's use cases, whose automated driving level are 2 or 3 on highway.
- Extract communication requirements of each use case in cooperation with the ITS FORUM.

### Examination of message-set

- Survey the message-set standards for safety driving and compare them with message contents of the JAMA's use cases. Extract the parts that can be shared with a message-set for automated driving.
- Estimate the message size, which is necessary for evaluating communication quality for each use case.

### Examination of protocol and evaluation of effectiveness

- Examine the frame construction and the protocol of the wireless communication for automated driving based on the ITS wireless communication methods in Japan as follows,

ITS FORUM RC-005 : Experimental Guideline for Vehicle-to-Vehicle Communications System using 5.8GHz Band

ARIB STD-T109 : 700 MHz Band Intelligent Transport Systems

ARIB STD-T75 : Dedicated Short Range Communications (DSRC) System

- Evaluate the communication performance under each use case requirement by computer simulation, and analyze the condition satisfying the target performance.
- From the above communication performance evaluation, it is confirmed that communication controls in cooperation with the application is necessary.

### Preparing of draft protocol specification

- Make a draft protocol specification of communication for automated driving based on each of the above ITS wireless communication methods. Extract additional functions required on the application or communication upper layer.
- As a result of this project, see the formulation of the wireless communication realizing the JAMA's use cases.

## Future plan

The outcome of this project will be utilized for the evaluation of the improvement effect by computer simulation or field test, such as stabilization of vehicle behavior and facilitation of traffic flow by applying the draft protocol specification to use cases.

Planning for formulating the experimental guideline of the wireless communication for automated driving will be implemented at the ITS FORUM.