Presentation **ITS-02-03**
Second session of the IWG on ITS
Agenda item 5

V2X communication for Cooperative Driving Automation

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Task force on V2X communication for Cooperative Driving Automation

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SIP
Cabinet Office

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ADS (Automated Driving Systems)

Safe and secure mobility for all

Competition

Cooperation

![SIP logo]

- ➤ **FOTs (Tokyo waterfront area etc.)**
- ➤ **Technology**
  - ・Establishment of digital infrastructure
  - ・Unification of data format and interface
  - ・Safety assurance and cybersecurity etc.
- ➤ **Public acceptance**
- ➤ **International cooperation/ Standardization**

SIP ; **S**trategic **I**nnovation Promotion **P**rogram
adus; **A**utomated **d**riving system for **u**niversal **s**ervice

◆ <u>**Current status of ITS wireless communication in Japan**</u>

- ETC / ETC2.0 (DSRC): Toll collection and Expressway information since 2000
- ITS Connect (DSRC): Support for safe driving at general road intersections since 2015

◆ <u>**Challenges for realizing CDA**</u>

- Can ITS communication, which has already been put into practical use, be used for CDA?
- What kind of communication method is needed in the era of automated driving?

- **TF on V2X communication for CDA has been established in SIP since 2019**
- **Started researching communication methods for CDA**

◆ **Activities of TF on V2X Communication for CDA**

- Define CDA
- Develop CDA use cases based on the definition

Phase1

Done

- Define communication requirements based on use cases
- Examination of applicability of existing ITS communication

Phase2

- Technology verification for Communication methods (frequency / bandwidth) for CDA
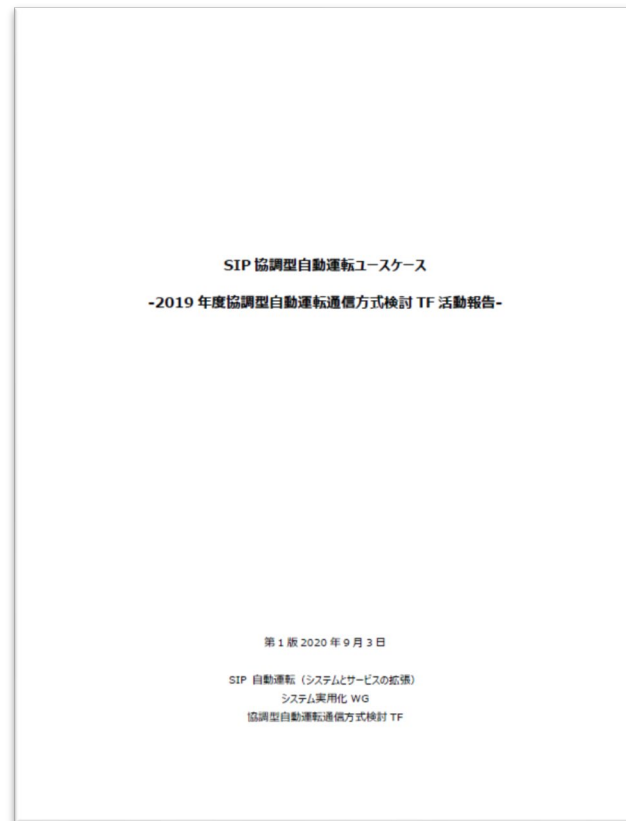- Proposal of communication method and the roadmap

Phase3

SIP

SIP Cooperative Autonomous Driving Use Case 1st Edition

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2. Definition of terms

3. CDA system definition/ Scope of study

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SIP 協調型自動運転ユースケース

-2019 年度協調型自動運転通信方式検討 TF 活動報告-

第 1 版 2020 年 9 月 3 日

SIP 自動運転（システムとサービスの拡張）
システム実用化 WG
協調型自動運転通信方式検討 TF

◆ Cooperative driving automation system definition

> CDA system is that enables safer and smoother automated driving control based on the autonomous driving system, by obtaining the information not detected by the in-vehicle sensor, by providing the information possessed by the vehicles, and by communicating mutually by using V2I and V2V.

- Communication reliability cannot be guaranteed 100%

- Automated Driving control must be done by in-vehicle sensors

- Support on autonomous driving by communication

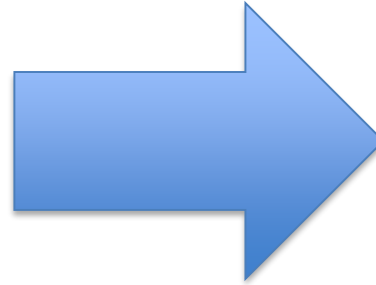- Utilize communication to enable safer and smoother automated driving

Selected 25 feasible use cases

study communication method based on the use case

3.communicating mutually by using V2I and V2V (7)

2.providing the information possessed by the vehicles (4)

1.obtaining the information not detected by the in-vehicle sensor (14)

Communication requirements for CDA
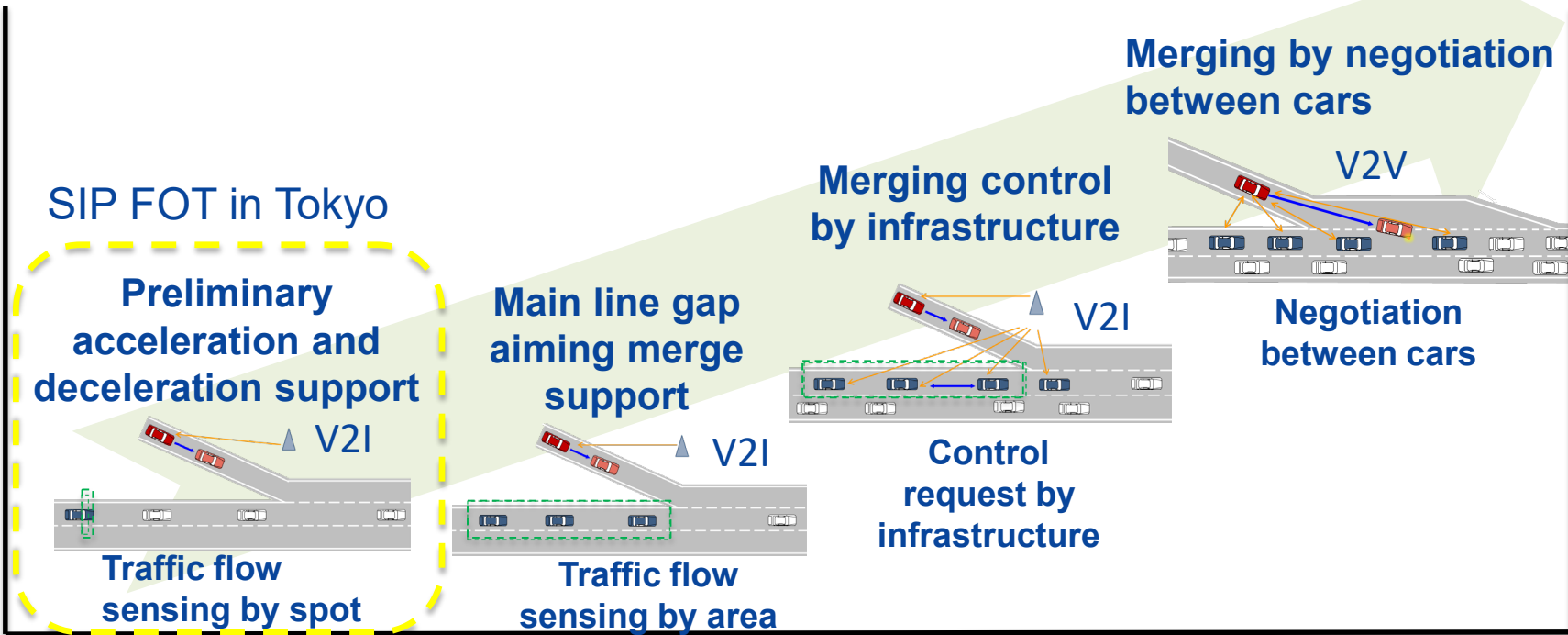
Proposal for V2X communication method

SIP Use case for CDA

Merging and lane change support

congestion

Complexity of traffic environment

Difficulty of communication

SIP FOT in Tokyo

Preliminary acceleration and deceleration support

▲ V2I

Traffic flow sensing by spot

Main line gap aiming merge support

▲ V2I

Traffic flow sensing by area

Merging control by infrastructure

▲ V2I

Control request by infrastructure

Merging by negotiation between cars

V2V

Negotiation between cars

Free flow

2020

Penetration of CDA

20XX

SIP

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6. Next step

- Define CDA
- Develop CDA use cases based on the definition

Phase1

Done

- Define communication requirements based on use cases
- Examination of applicability of existing ITS communication

Phase2
FY2020

- Technology verification for Communication methods (frequency / bandwidth) for CDA
- Proposal of communication methods and the roadmap

Phase3
FY2021

SIP

◆ Organization

TF on V2X communication for CDA

Phase1

-ITS-related ministries

-Academic experts

-Japan Automobile Manufacturers Association

Phase2/Phase 3

-National Institute for Land and Infrastructure Management

-UTMS Society of Japan

-Japan Electronics and Information Technology Industries Association

-ITS Info-communications Forum

-Society Automotive Engineers of Japan

7. Summary

- Started researching communication methods for CDA in SIP

- Completed the development of use cases to be the basis for the next research

- Use cases opened to the public

  (SIP homepage: https://www.sip-adus.go.jp/rd/rddata/usecase.pdf)

- Started researching the definition of communication requirements based on use cases and the applicability to existing ITS communication.

- Consider a new communication method if it is not applicable to existing ITS wireless communication

- Provide the proposal of communication methods for CDA and roadmap until the end of FY2021

SIP-adus
Workshop
2020

held as a
Virtual Conference

SIP-adus:Innovation of Automated Driving for Universal Services

Objectives

- Reports by industry and academia research partners on the achievements of SIP-adus projects in Japan.
- Presentations by global experts on recent global progress and the status of R&D themes focusing on automated driving and connected vehicles.

Date

November 10 - 12, 2020
- November 10: Status report meeting (Live)
- November 11 - 12: Online symposium (Recorded)

The meeting will be simultaneously delivered in both English and Japanese over the web. By registering, everyone from all over the world is welcome to all meetings.

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	Status report meeting (Live)	Online symposium (Recorded)	
	Tuesday, November 10	**Wednesday, November 11**	**Thursday, Nobember 12**
	start at 9:30 (JST)	start at 9:00 (JST)	start at 9:30 (JST)
AM (JST)	Opening Session	Opening Session	Japanese Government
	Utilization and exchange of data for implementation of Society 5.0	Regional Activities	Safety Assurance
	Development and utilization of traffic environment information		
PM (JST)	Toward realization of safe automated driving	Service & Business Implementation	Cybersecurity
	Society with automated driving for universal services	Dynamic Map	Human Factors
	Closing	Connected Vehicles	Impact Assessment
			Closing

European Region	start at 9:30 (CET)	start at 11:00 (CET)
US Region	start at 11:30 (EST)	start at 14:00 (EST)

Registration: https://en.sip-adus.go.jp/evt/workshop2020/

Thank you