



SIP-adus

-The challenges for Automated Driving Systems realization in Japan-

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21 Apr. 2021

SIP ; Strategic Innovation Promotion Program
adus ; Automated driving system for universal service





Strategic Innovation promotion Program

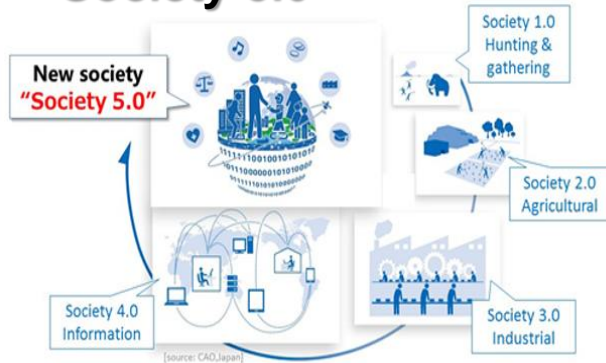
SIP 2nd FY2018~FY2022



12 themes on going (SIP-adus is one of them)

adus ; Automated driving system for universal service

Society 5.0



- Promote cross-sector and **industry-academia-government collaboration**
- Intensive R&D program from **fundamental research to practical and commercialization**
- Promote Regulatory reform

SIP-adus Initiative

ADS (Automated Driving Systems)

Safe and secure mobility for all



Competition



Cooperation



Realization of **S**ociety 5.0



➤ Technology

- ① Dynamic Map
- ② Safety Assurance
- ③ Cybersecurity
- ④ Geospatial dynamic data utilization etc.

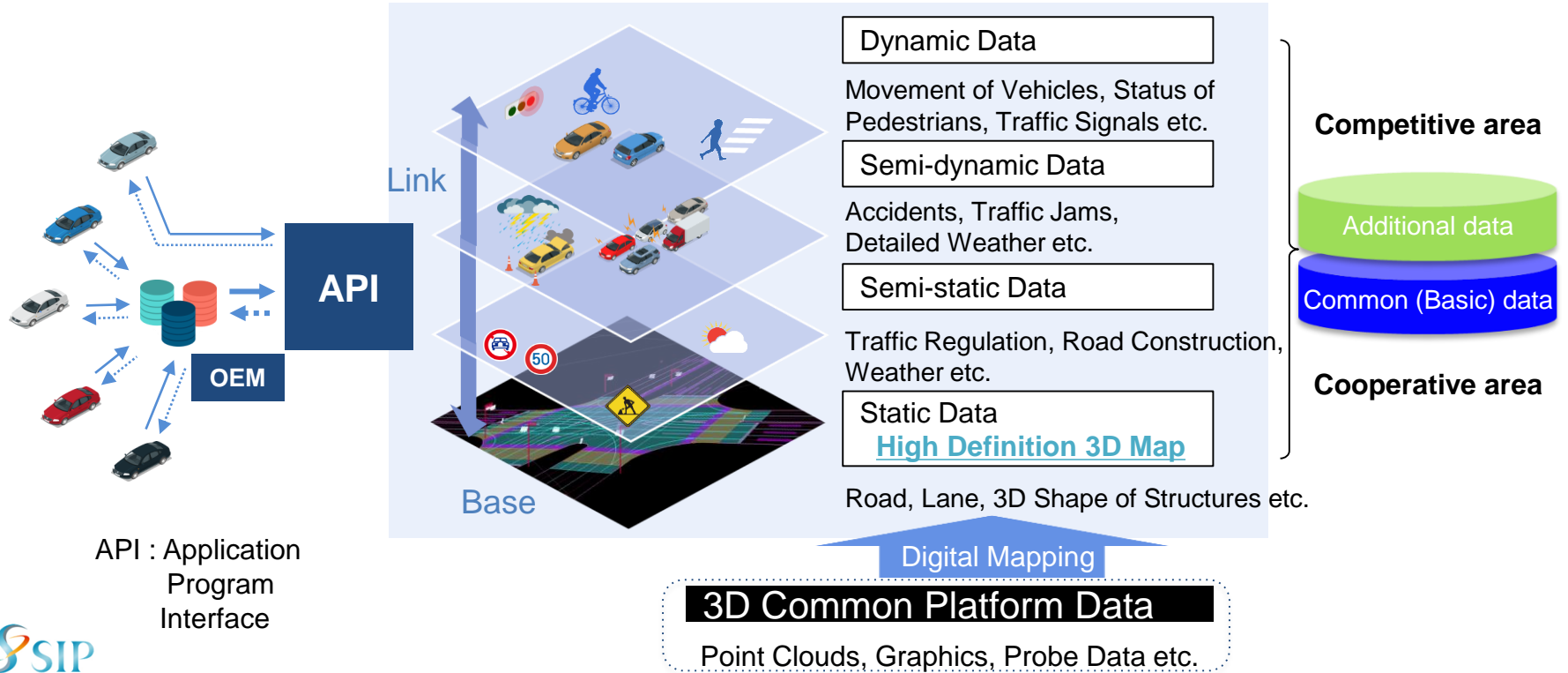
➤ Int. cooperation/Standardization

➤ Public acceptance

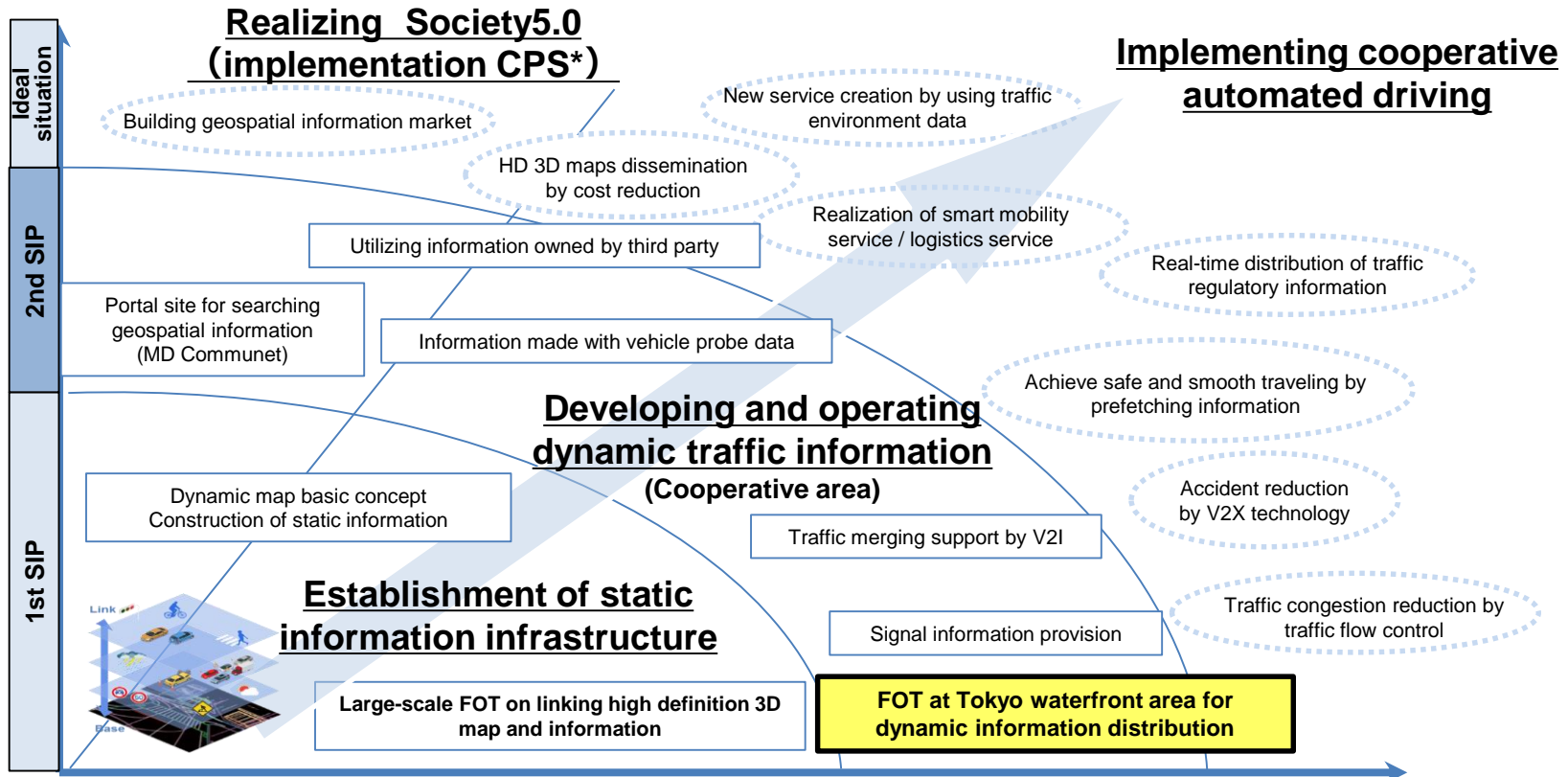
➤ Deregulation/Regulatory reform

Dynamic Map

To use combination database of high definition 3D map data with dynamic data such as traffic jam, road construction info.

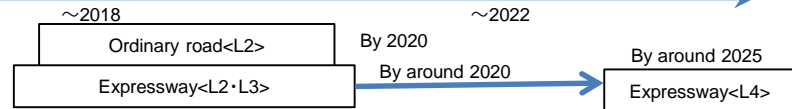


Building the Traffic Environmental Info. Framework



*CPS : Cyber Physical System

[Scenario for private car]



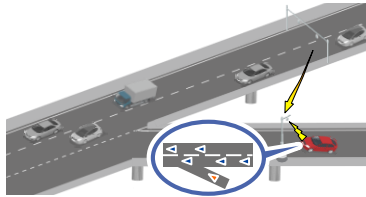
Field Operational Test in Tokyo Waterfront area

◆ FOT period ; Oct. 2019 ~ Mar. 2021

- Signal display and change timing information via ITS infrastructure



- Merging assistance on the main lane of highways



- HD 3D map linked with traffic info. etc



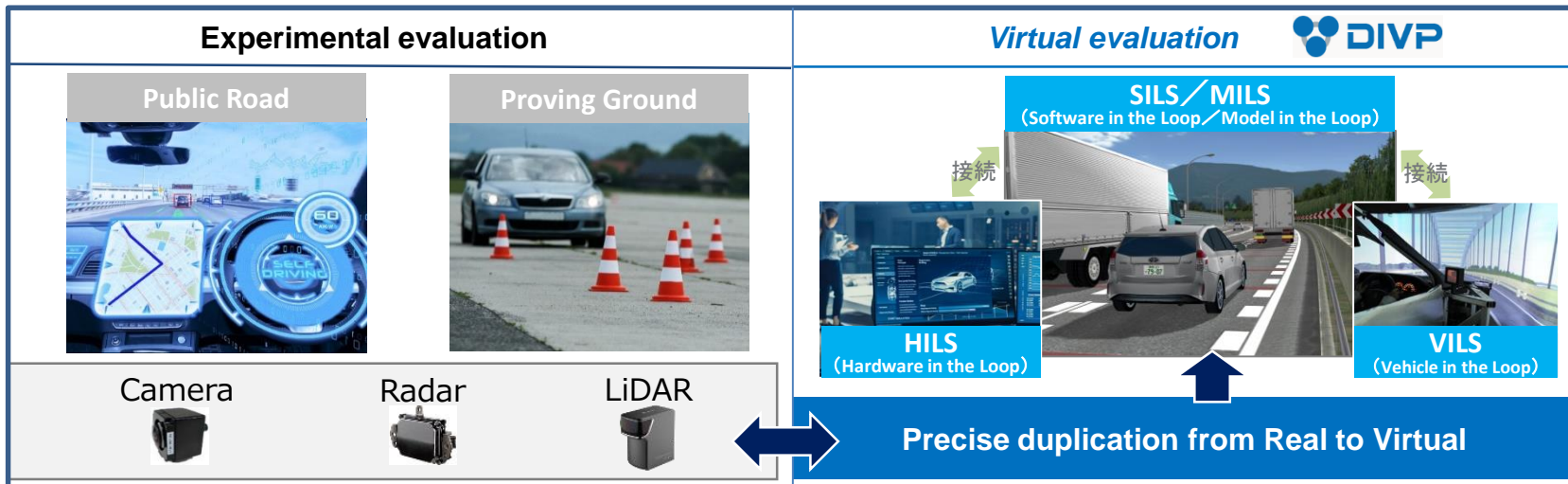
◆ Participants ; Total 29



Alphabetical order. A total of 29 institutions

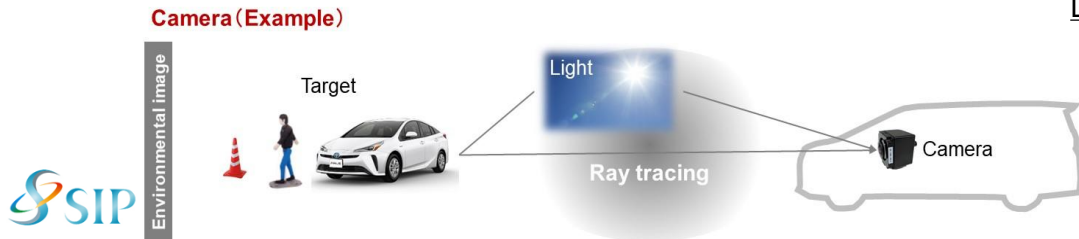
Safety assurance; Evaluation in virtual space

Project focus ; Precisely Duplication from Real to Virtual, and Verification of consistency between sensor model and real testing by 10-RIs as DIVP™ Consortium



Source : Kanagawa Institute of technology, MITSUBISHI PRECISION CO.,LTD., DENSO Corporation, Pioneer Smart Sensing Innovations Corporation, Hitachi Automotive Systems, Ltd.

DIVP™ Consortium (10-Research Institutes)



Safety assurance

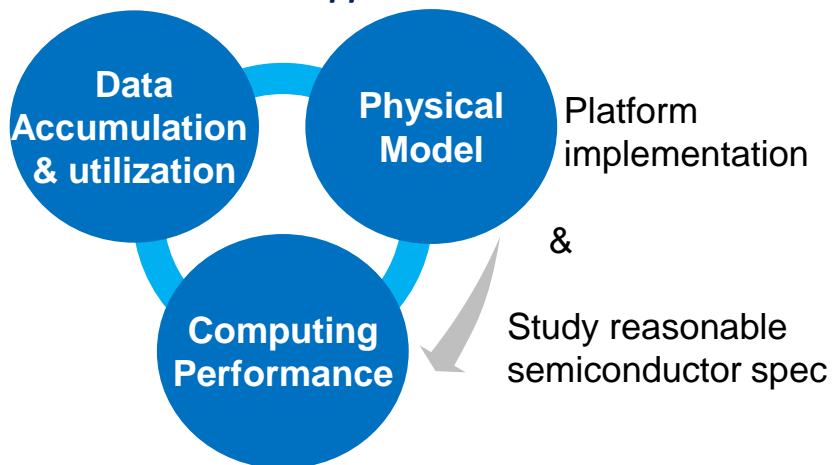
DIVP™ Driving Intelligence Validation Platform



- Scope & Objectives

DIVP™ scope

Trinitarian approach



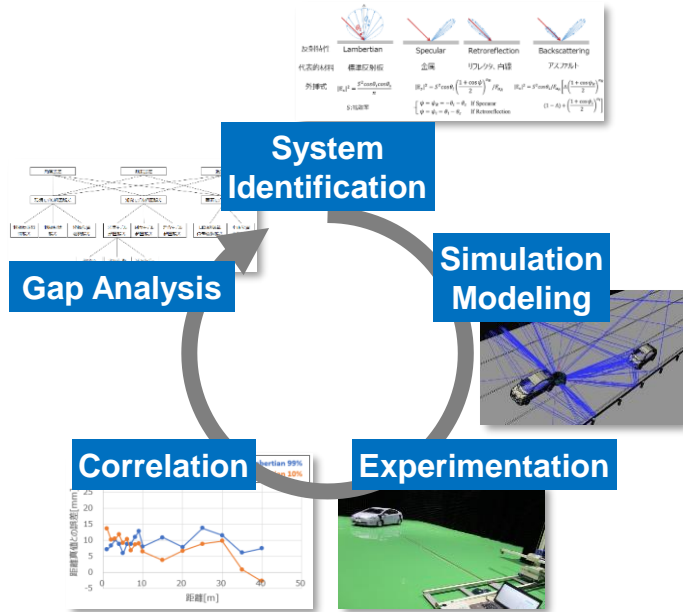
DIVP™ Objectives

- *Open Standard Interface*
- *Reference platform with reasonable verification level*
- *E & S pair model based approach (E : Environmental model, S : Sensor model)*

DIVP™ will improve Simulation based AD Safety validation for Consumer acceptable Safety assurance

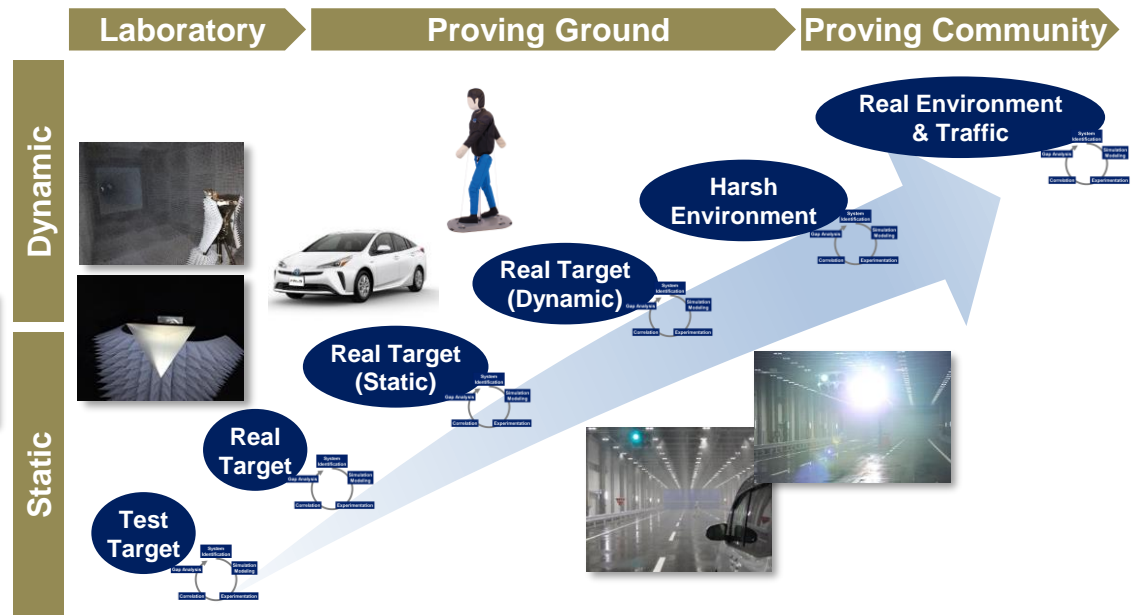
Physical modeling framework

Real physics based approach



反射特性	Lambertian	Specular	Retroreflection	Backscattering
代表材料	標準反射板	金属	反射シート、内蔵	反射シート
反射率	$R_L = \frac{1}{\pi} \cos^2 \theta$	$R_S = \delta(\theta - \theta_0) \delta(\phi - \phi_0)$	$R_R = \delta(\theta - \theta_0) \delta(\phi - \phi_0)$	$R_B = \delta(\theta - \theta_0) \delta(\phi - \phi_0)$
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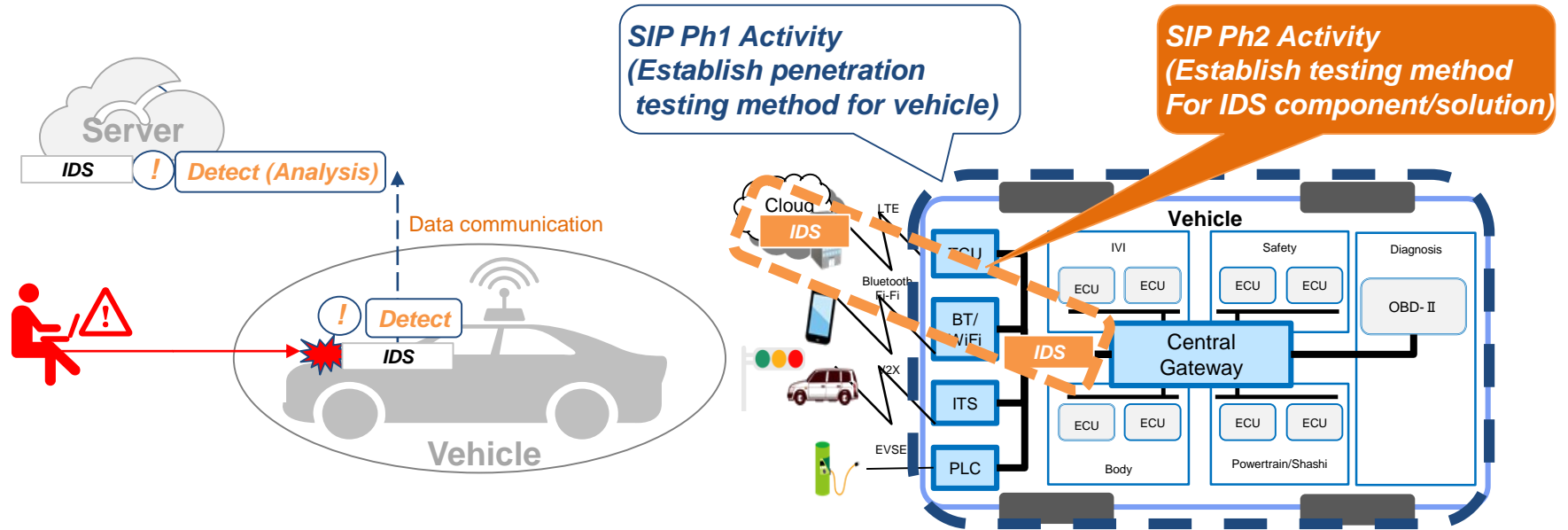
Enhancement roadmap



DIVP™ propose to model enhancement roadmap to meet user needs

Cybersecurity

- ◆ To Establish **evaluation method for Intrusion Detection System(IDS) components/ solutions** provided by various security vendors from the view point of user(OEM).



1. Collection of new attack method or incident info.

2. Analysis of new attack method

3. Risk and Impact analysis for attack method

4. IDS evaluation by using testbed

5. To establish guideline for IDS evaluation

International cooperation



Human Factors



Safety Assurance



Impact Assessment



Cybersecurity



HADRIAN

HEADSTART



**SIP-adus
Workshop
2020
【Web】**

10-12, Nov.



Total participants ; 1030 (overseas participants ; 140)



SIP-adus Workshop 2021 ; 9-11 Nov.



Thank you

SIP-adus HP

<https://en.sip-adus.go.jp/>