



SIP-adus

-Mobility bringing everyone a smile-

February 14, 2017

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Program Director, Cabinet Office

<Translated Version>

Outline of the SIP-adus

Steering Committee for
SIP Automated Driving
Research Project

Chairman: Program Director Mr.Kuzumaki (Toyota)
Membership: Ministries and agencies concerned with ITS,
automobile manufacturers, academic experts,
automobile-related organizations, etc.

System Implementation Working Group

- [I] Development and validation of the automated driving system
- [II] Development of base technologies to reduce traffic accident fatalities and congestion

International Cooperation Working Group

- [III] Building of international cooperation

Next Generation Transport Working Group*

- [IV] Development toward realization of next-generation transport

Large Scale Field Operational Test Task Force

Study of the content, locations, and size of large-scale field operational tests

Map Structuring Task Force

Surveys and studies on the enhancement of map data

HMI Task Force

Surveys and studies on HMI (Human Machine Interface)

*Also serves as Working Group 4 of the promotion conference for CSTI's "Task Force on Science, Technology, and Innovation for the 2020 Tokyo Olympic and Paralympic Games"

➤ R&D for the SIP "Automated Driving System"

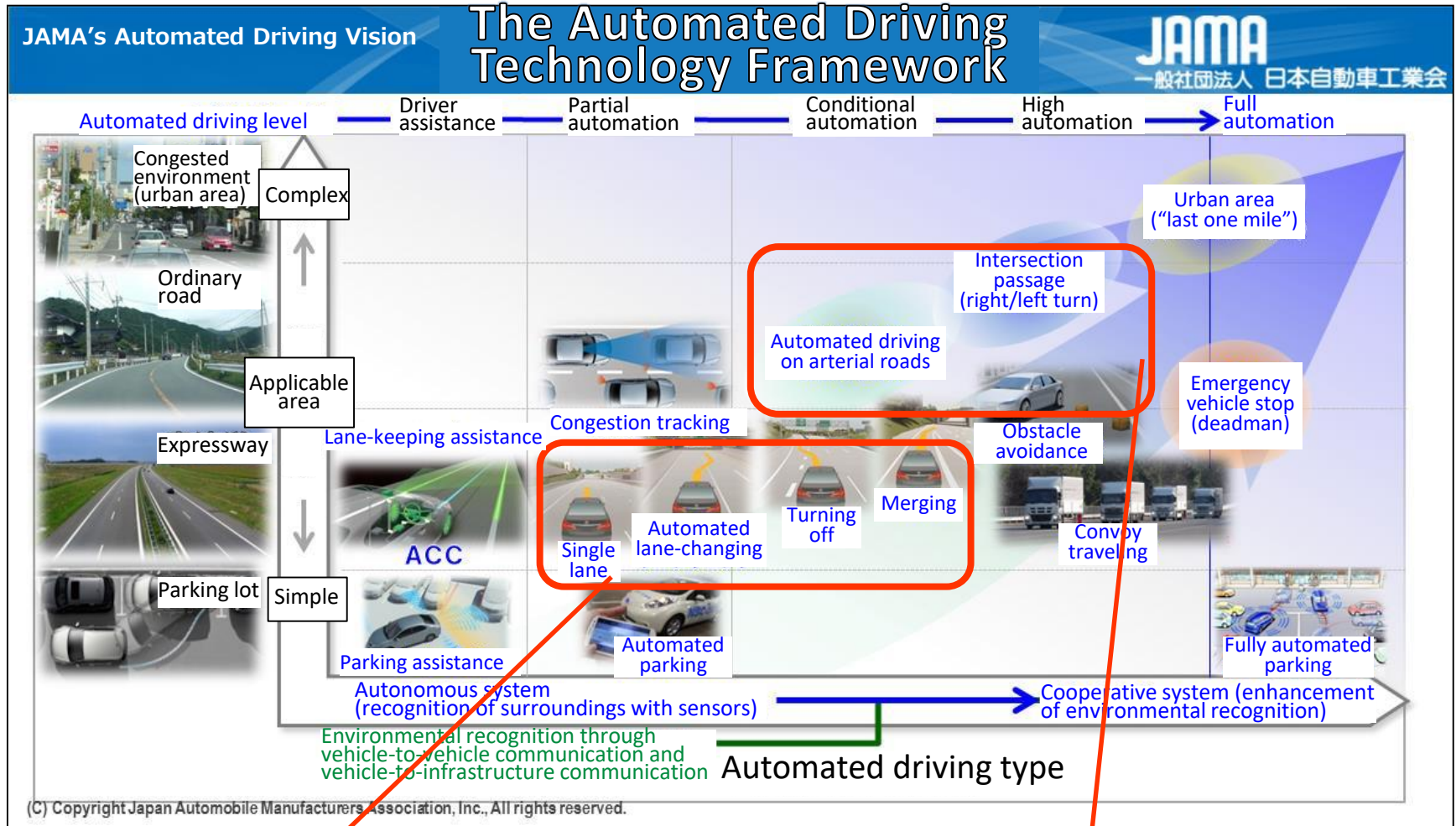
FY2014: Approx. 2.535 billion yen

FY2015: Approx. 2.358 billion yen

FY2016: Approx. 2.713 billion yen

R&D was promoted under the leadership of the Program Director and in cooperation with ministries and agencies concerned (NPA, MIC, METI, MLIT)

Outline of the R&D Plan: Objectives



(1) Practical application of a high-end semi-automated driving system (Level 2) by 2020

(2) Clarification of functional expandability requirements and priority for next step and scheduling of its deployment

Accelerate and realize the development of digital infrastructure by leveraging the large-scale field operational tests.

SIP-adus R&D Fields

Vehicle



Recognition

Maps, ITS info, sensors



Judgement

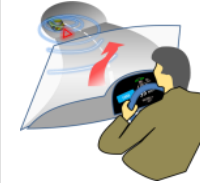
Control, artificial intelligence



Operation

Hydraulics, electric motor

HMI*



Human Machine Interface

Harmony with people

Enhanced
 • localization
 • Surrounding environment recognition

Are important for the automated driving system

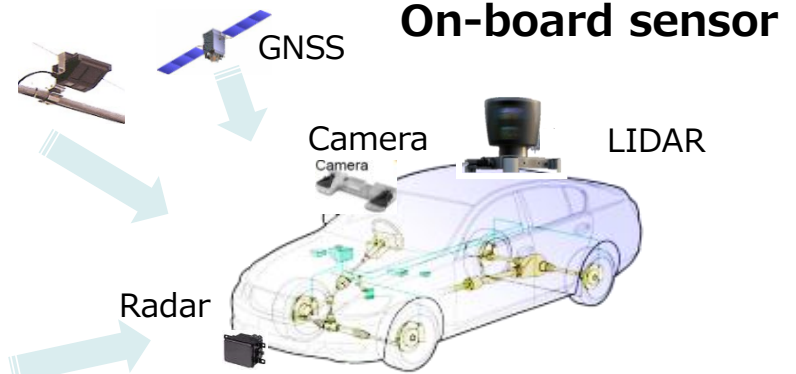
Dynamic map



High-definition digital map



ITS information



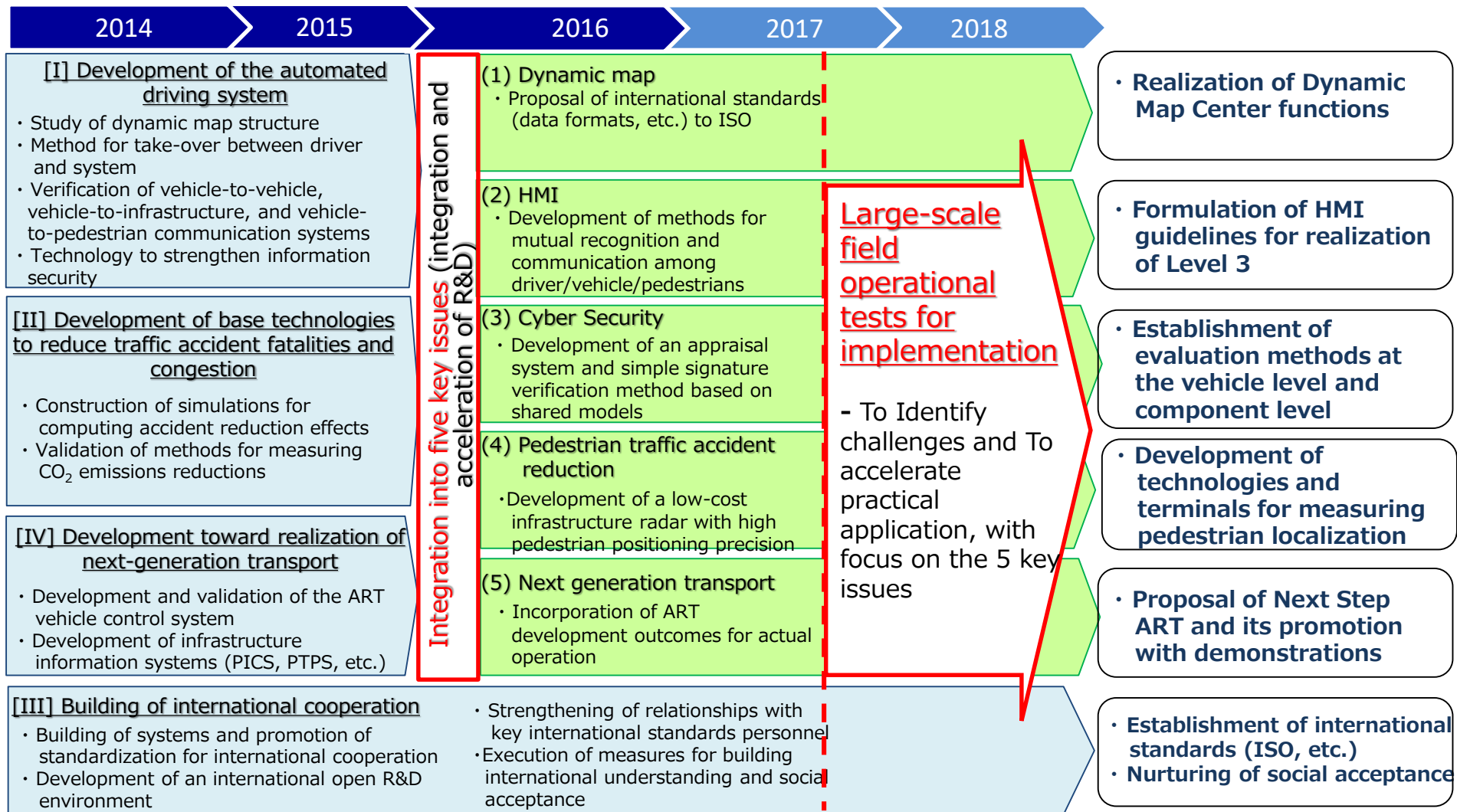
Base technologies

Cyber Security, simulation, database, etc.

Red text: Area of cooperation undertaken at SIP

Promoting R&D focused on topics for collaborative industry-academia-government collaboration at SIP

Overall Schedule and Final Output Goals



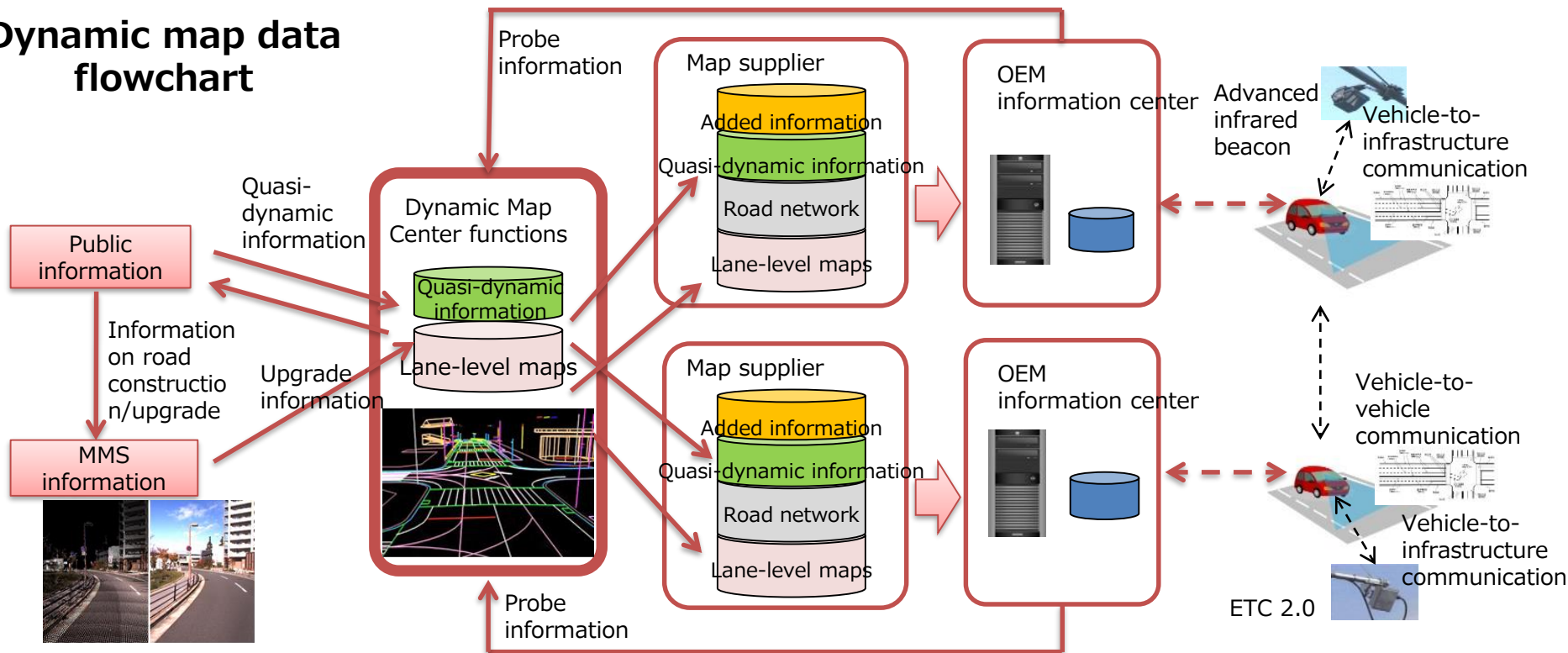
*Linked with SIP's "Maintenance of Cyber Security in Important Infrastructure, etc."

Reinforcement and promotion of i) development, ii) field operational tests, and iii) international cooperation, with focus on the 5 key issues

Progress with the Dynamic Maps

Ultimate goal: **Realization/commercialization of Dynamic Map Center functions and standardization**

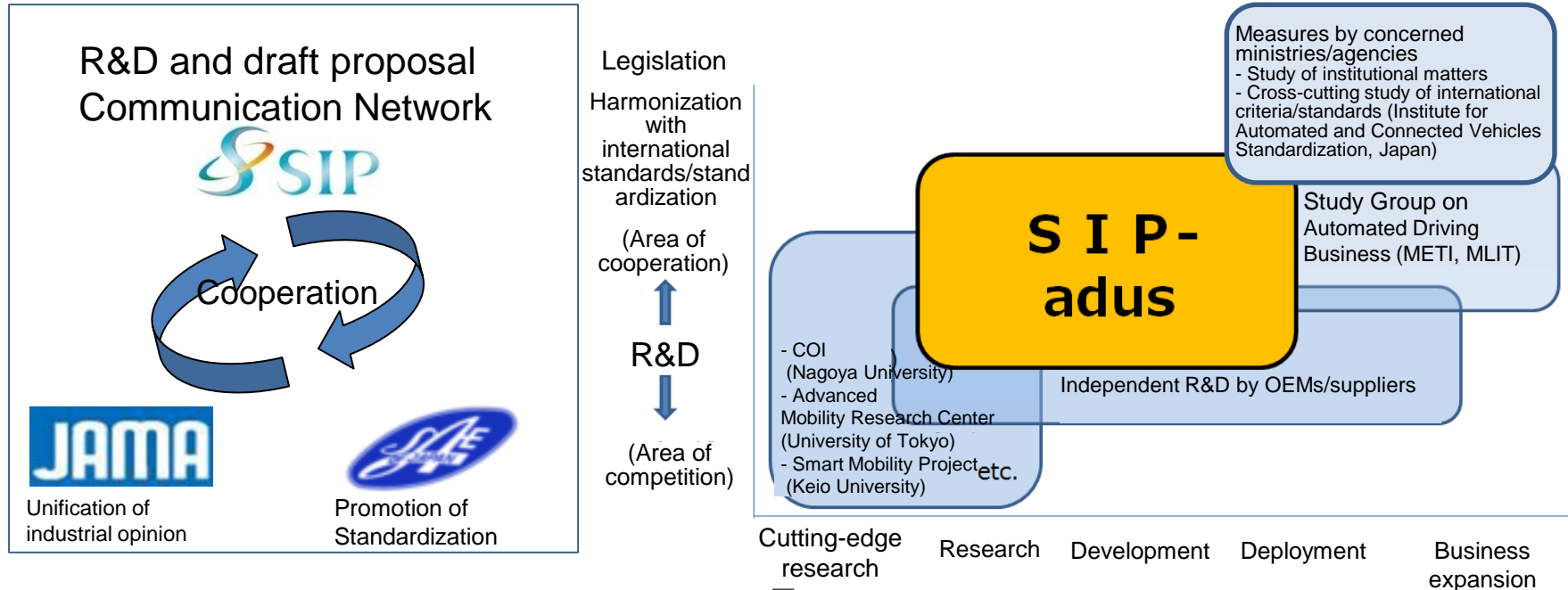
Dynamic map data flowchart



- **Establishment of Dynamic Map Planning Co., Ltd. (DMP)** → Start of study toward becoming a business company
- Preparation of high-precision 3D maps covering approximately 300 km (of a total of 600 km) for use in large-scale field operational tests
- Cooperation and discussion with concerned organizations (JARTIC, etc.) for tying with existing quasi-dynamic information
- Finalization of static map specifications, **proposal to ISO/TC204/WG3**, and beginning of standardization work

Cooperation with Organizations and Projects Concerned

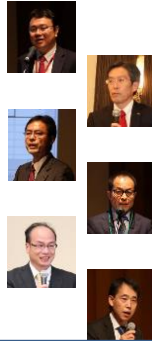
- (1) Addition of committee members from the Society of Automotive Engineers of Japan (JSAE) and Japan Automobile Manufacturers Association (JAMA) (2) Organization of **liaison meetings among SIP, JAMA, and JSAE** → Acceleration of standardization through sharing of usage cases, etc.
- Promotion of **mutually-complementary development** through collaboration with COI (Nagoya University), the Study Group on Automated Driving Business (MLIT, METI), and others
- Launch of **independent workshops** for automated driving in ITS Japan and the Japan Electronics and Information Technology Industries Association (JEITA)
- Start of cooperation with the European Automobile Manufacturers' Association (ACEA) and Japan Automobile Importers Association (JAIA) → Announcement of participation in large-scale field operational tests
- Cooperation in SIP's infrastructure maintenance, disaster preparedness and mitigation, and cyber security through dynamic maps



International Cooperation

- Establishment of an **SIP contact point for six key international cooperation themes** and continuous participation in international conferences in the US and Europe and teleconferences → Formation of a US-Europe-Japan network centered on SIP

- Dynamic Map
- Connected Vehicles
- Human Factors
- Impact Assessment
- Next Generation Transport
- Cyber Security



◇ Third SIP-adus Workshop 2016

SIP-adus: Innovation of Automated Driving for Universal Services

Dates: November 15 to 17, 2016 Venue: Tokyo International Exchange Center

Participants: 61 speakers (**34 from outside Japan**), including Yosuke Tsuruho, Minister of State for Science and Technology Policy; Finland's Minister of Transport and Communications; and Dr. Kazuo Kyuma, full-time member of the Council for Science, Technology and Innovation 425 total participants (**50 from outside Japan**)

Content: Recognition of the work of the sessions and subcommittee for discussion among experts (Breakout WS)

→ **Europe decided to hold a similar international conference** on automated driving (April 3, 4)

◇ Joint Japan-Germany statement on promoting R&D on automated driving system technology

German Minister of Education and Research Wanka and Japanese Minister of State for Science and Technology Policy Tsuruho signed and announced the joint statement in Berlin, Germany, on January 12, 2017. Discussions are planned for future German participation in the large-scale field operational tests.

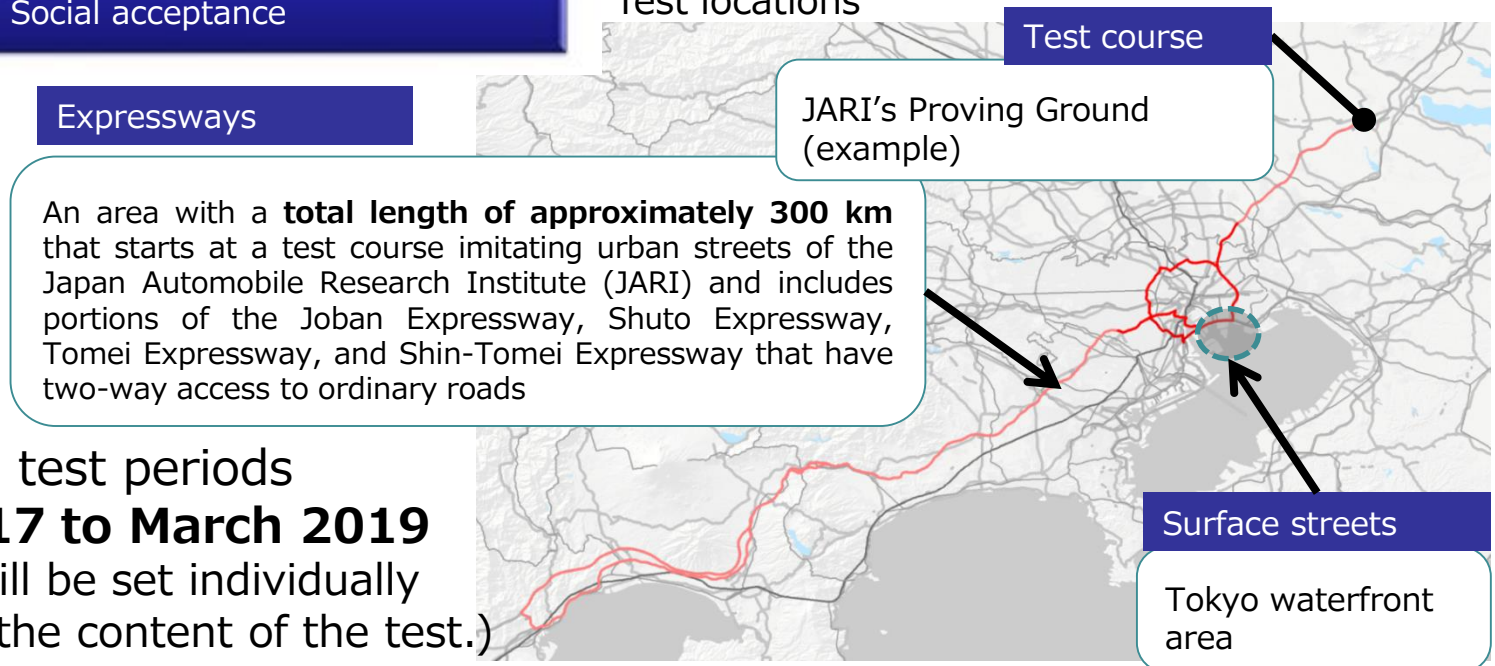
Large-Scale Field Operational Tests



- To Provide **opportunities for open discussion** through large-scale operational tests on public roads, to promote international standardization and R&D with focus on the 5 key issues, and to hold social acceptance-building events
- Envisioned participants

- Domestic and **foreign OEM/suppliers**
- Universities/research institutes
- Concerned ministries and agencies/journalists/members of the general public

Test locations



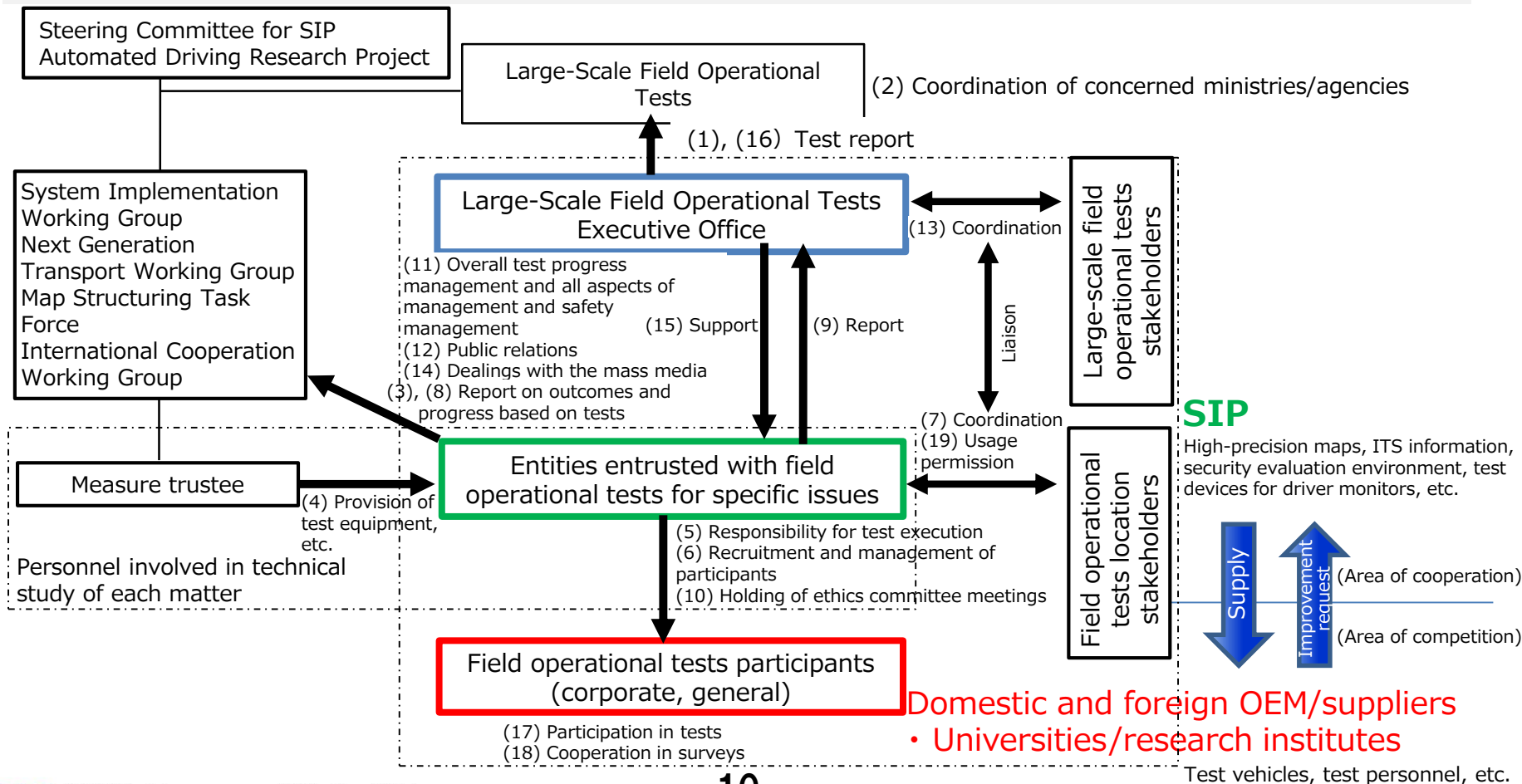
Duration and test periods

Autumn 2017 to March 2019

Test periods will be set individually depending on the content of the test.)

Field Operational Tests and Safety Management Scheme

- High-precision maps and test environments are provided by SIP, and test vehicles and test personnel are provided by participants (OEM, suppliers, universities, research institutes).
- The Large-Scale Field Operational Tests Executive Office has cross-cutting authority and oversees progress and safety management for all aspects of the tests.
- The tests will be in compliance with the “guidelines for field operational tests of automated driving systems on public roads” (National Police Agency).
- Test organizers plan to purchase insurance that covers the costs of investigations into accident causes and first response costs.

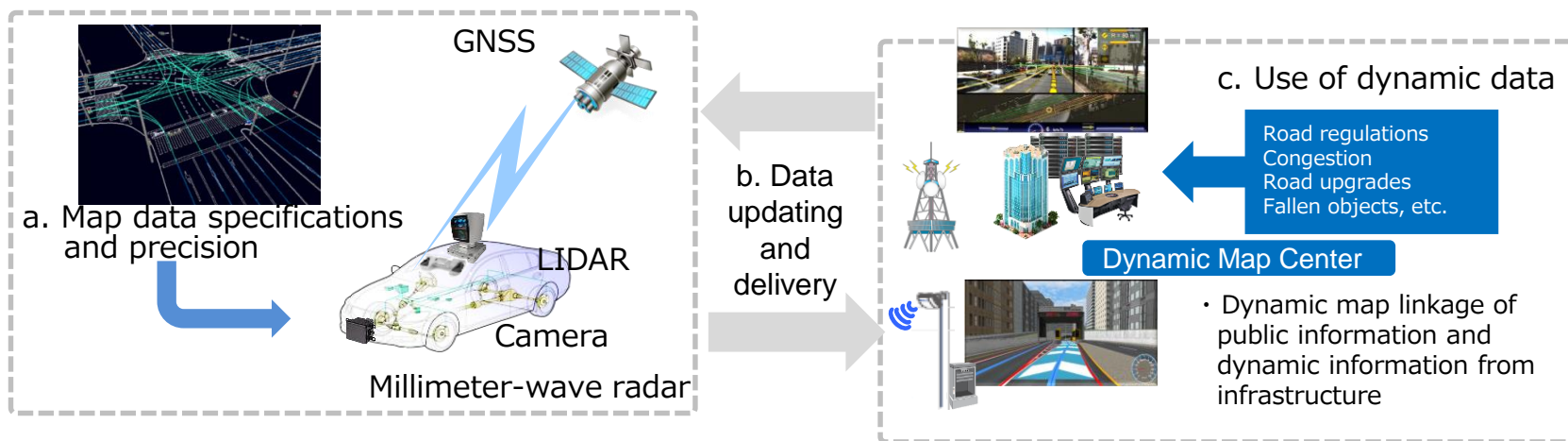


Content of the Field Operational Tests (Example)

Dynamic maps

- Validation of the specifications and precision of high-precision 3D map data
- Validation of the data update and delivery systems
- Validation of the quasi-dynamic information specifications for vehicle control and driver assistance

- standardization
- Start of commercialization-based services



HMI

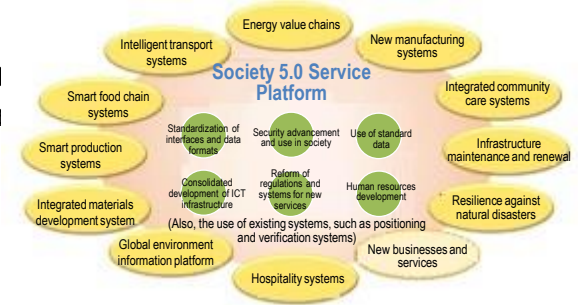
- Clarification of the time required for transfer from automated driving to manual driving based on the definition of "readiness"
- Development of a driving behavior database to promote HMI R&D and standardization



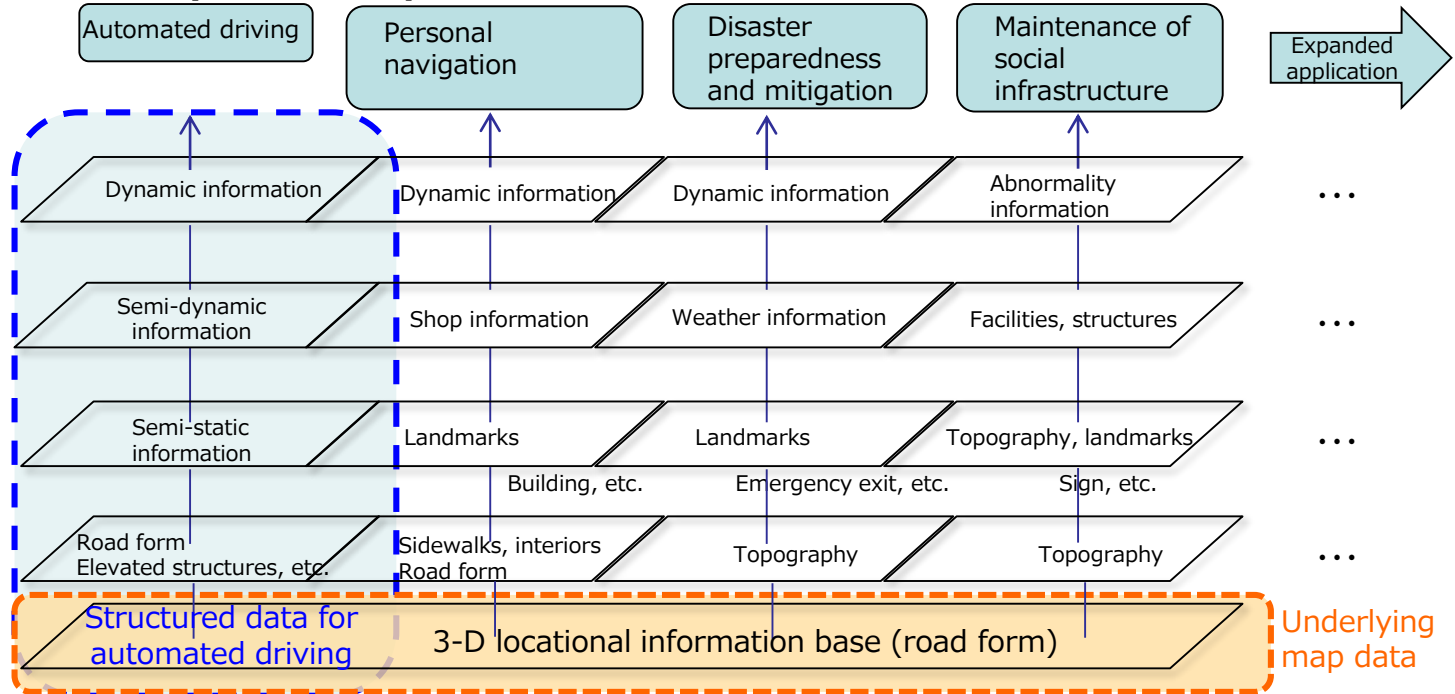
Toward Realization of "Society 5.0"

Society 5.0: A "Super Smart Society"
(Fifth Science and Technology Basic Plan)

- (1) **Sophisticated integration of cyberspace with physical space**
- (2) Simultaneous pursuit of economic development and resolution of social cha
- (3) Realization of a human-centered society that permits a high quality of life



Multipurpose use of dynamic maps

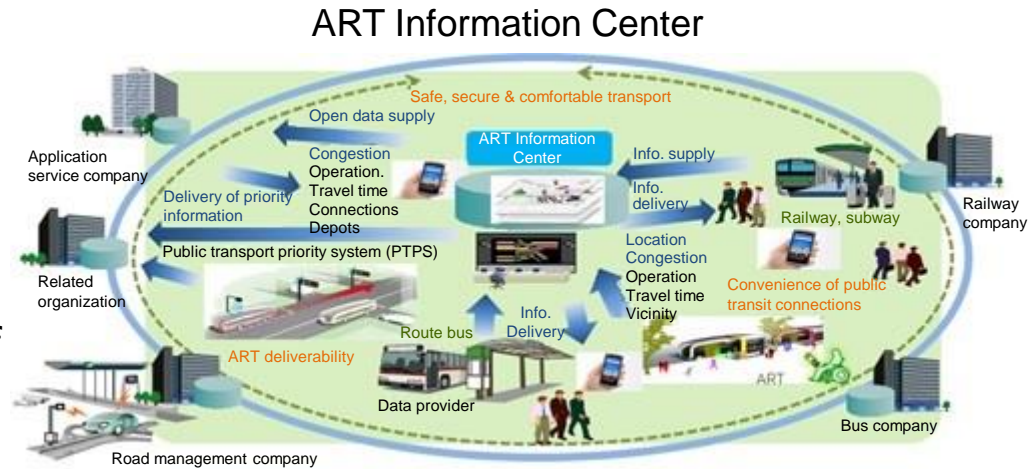


Promotion of multipurpose use for the realization of Society 5.0 and commercialization of dynamic maps

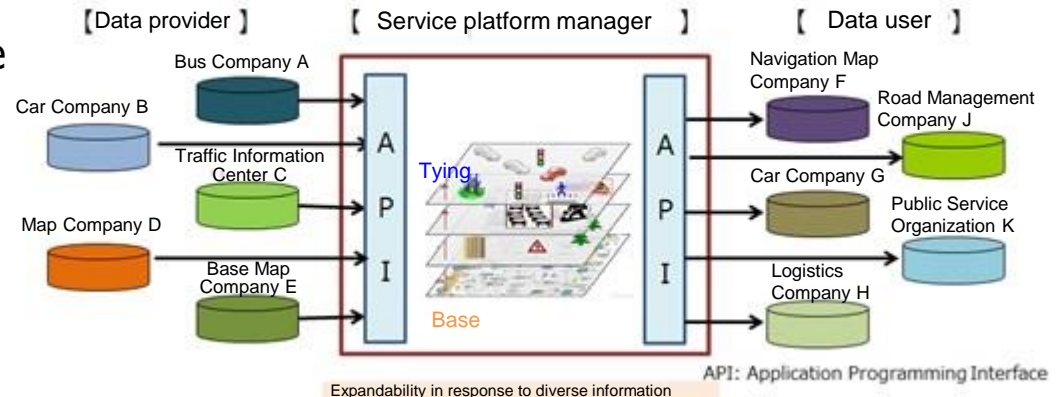
Challenges and Initiatives for the Future

◆ Promoting multipurpose use of dynamic maps

- Modeling and proposal of travel support services utilizing traffic information that is based on dynamic maps
- Cooperation in SIP's infrastructure management and disaster preparedness/mitigation, and validation of the usefulness of dynamic maps
- Building of a record of use by public institutions
- Pursuit of cost reduction
- Building of a service platform for the safe and stress-free exchange of the wide variety of geospatial data possessed by the public and private sectors.



Service platform



Mobility bringing everyone a smile!



Thank you for your kind attention.