



| METI's effort to realizing automated driving

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CONTENTS

- Toward Social Implementation of Automated Driving
- METI Activities(RoAD to the L4)



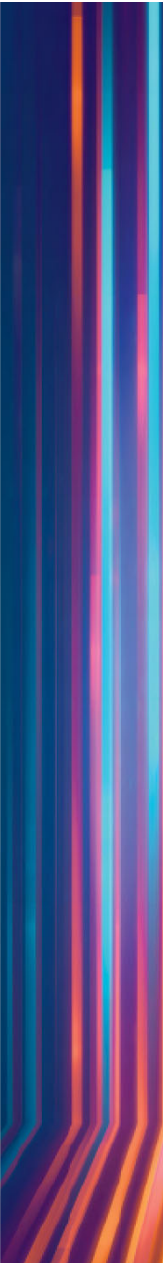
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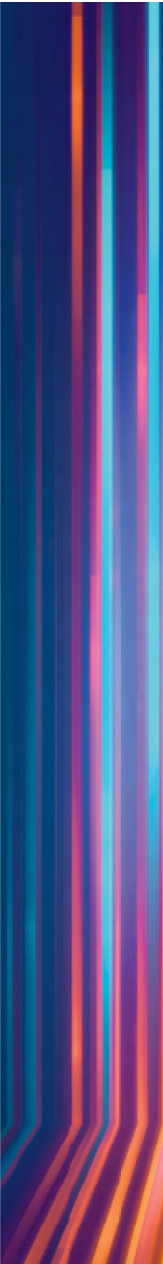
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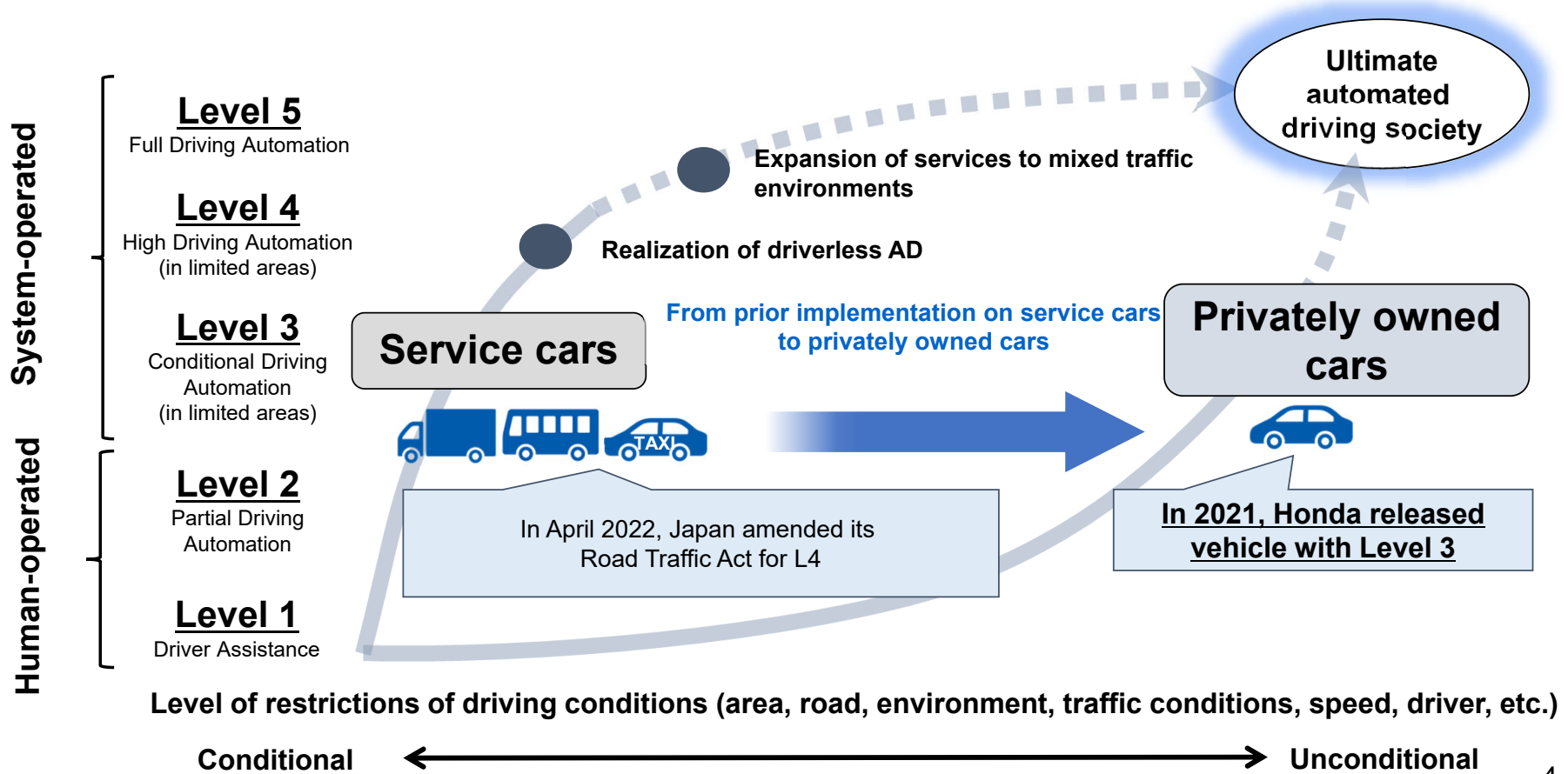


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Efforts for the social implementation of automated driving

- Because of many existing issues for AD L5, Japan seeks to first implement L4 in service cars. In April, 2022, Japan amended its Road Traffic Act for L4, with enactment scheduled for FY2022.
- By FY2025, the “Road to the L4” project aims to establish L4 AD services in over 40 locations, as well as the practical application of L4 trucks on expressways and an expansion of services to mixed traffic environments.



Issues to be resolved in order to realize of driverless AD services

- To ensure the steady social implementation of driverless AD services in 40 locations by 2025, it may be necessary to undertake efforts focused on the following.

Accelerated commercialization

Cost aspects:

- Support measures for early adopters of automated driving and their initial costs/running costs have been clarified.
- To ensure the provision of sustainable mobility services

Environmental improvements (infrastructure, legal developments, etc.)

Securing and developing human resources for L4:

Construction of a sustainable business framework:

Methods of linking infrastructure:

Technological developments

Development of elemental technologies:

Sophistication and standardization of technical aspects:

Increased social acceptance

Gaining the understanding and cooperation of relevant parties in local regions:

Clarification of roles between relevant parties:

By focusing on these issues, R&D and demonstration projects will be carried out in the main driving environments outlined in the "RoAD to the L4".

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“RoAD to the L4” Project Overview

- Aimed at the realization and popularization of unmanned AD services, coordination with relevant ministries and agencies in underway in the promotion of "Advanced mobility service research, development and social implementation project for L4 AD, etc. (RoAD to the L4)".
- By FY2025, the “Road to the L4” project aims to establish driverless AD services in over 40 locations, as well as the practical application of L4 trucks on expressways and an expansion of services to mixed traffic environments shared by pedestrians and other vehicles, such as urban areas.

Theme 1: Realization of L4 services in limited locations

- In limited locations and vehicles with remote monitoring (L4) by FY2022



(Image) Remotely operated AD system in Eiheiji Town

Area/vehicle expansion

Theme 2: Support for area/vehicle expansion

- L4 driverless AD services to diverse areas and with various type of vehicles in over 40 locations by FY2025.



(Image) AD buses

Theme 3: Practical application of advanced logistics systems on expressways

- Efforts for practical application of high-performance trucks, including platooning on expressways (around 2025)



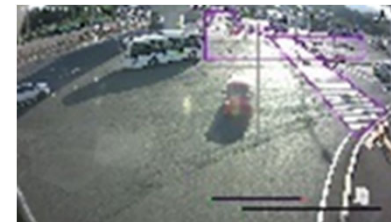
(Image) Automated driving on expressways

Support for mixed traffic environments

Theme 4: Establishment of services in mixed traffic environments

Support for mixed traffic environments

- Harmonization and interoperability of infrastructure, V2V and V2P for deployment of L4 AD in more complex mixed traffic environments



(Image) Driving assistance using data from road infrastructure

Theme 1. Demonstration of AD Service with Remote Monitoring (L4)

Target

- Demonstration of an AD Service on Limited Area and Vehicles with **Remote Monitoring (L4) by FY2022**
- **Establish Basic Business Models and Institutional Structure for AD Service with Remote Monitoring (L4)**

Approach Policy

- In limited locations such as discontinued railway sites using low-speed vehicles.
- Study the roles of remote operators and their tasks other than establishing driving technology and the commercial deployment of remotely monitored L4.

Main Activities

2021

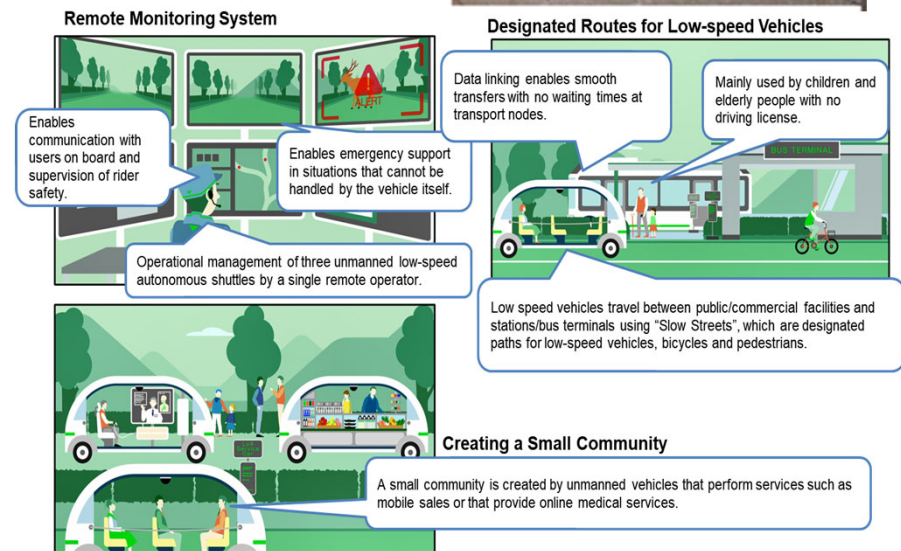
- Organization of business models
- Operation, demonstration and evaluation of systems that enables remote monitoring of 3 vehicles by one person
- Demonstration and evaluation of remote operators' task
- Advancement to L4 vehicles and systems

2022

- Analysis and creation of models for the deployment of business models
- Requirements for remote operators to increase the number of vehicles monitored
- Build structures for tasks excluding driving



Future Image



Theme 2 . L4 MaaS Service Expansion for Multiple Area and Vehicle Types, and Improvement of Business Viability

Target

- Deployment of driverless AD services to diverse areas with various type of vehicles (L4) **at over 40 locations by FY2025.**
- Establish business models and infrastructure/institutional structure for the deployment of varied services.

Approach Policy

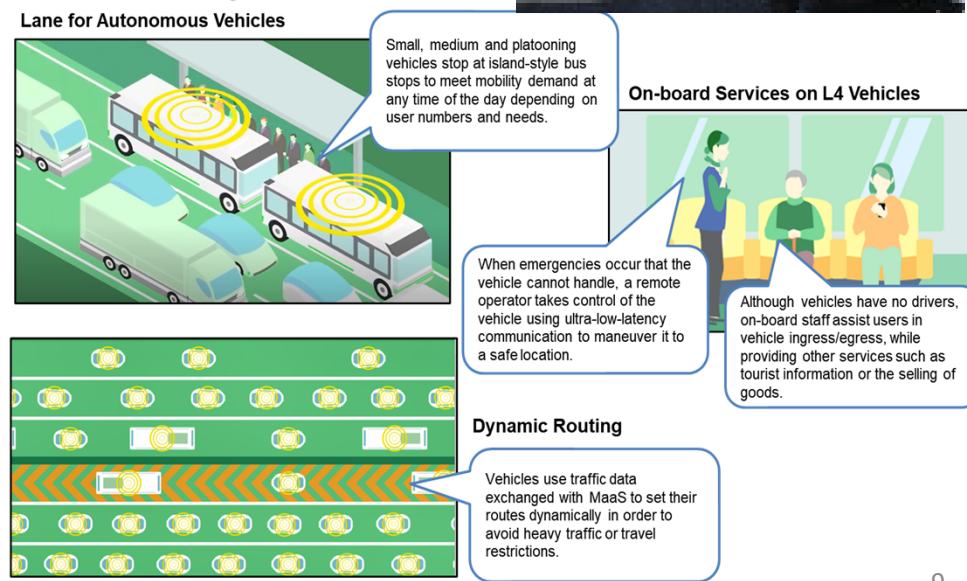
- Promote the development of vehicles and systems with specification and functions that have appropriate safety for their ODD and operating conditions, assuming AD services in various areas and with various vehicles.
- Promote efficient rolling out of services

Main Activities

- 2021
 - Use cases for driverless AD services
 - Study of business models
 - Creation of a typology of ODD for AD services
- ~2022
 - Sophistication and diversification of AD bus
 - Advancement of remote monitoring systems
- ~2025
 - Increase # of use cases, and business models
 - Demonstration and evaluation of various driving environments and vehicles



Future Image



Theme 3 . Deployment of High-Performance Trucks including Platooning on Expressway

Target

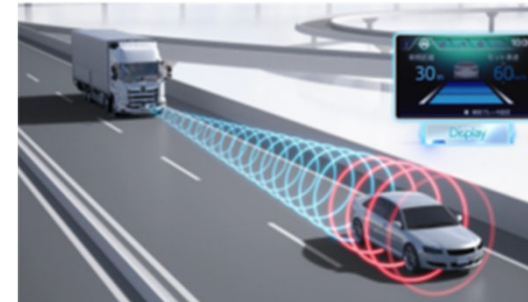
- Deploy L4 AD trucks and its platooning technology on expressway after 2025
- Develop not only vehicle technologies but also necessary environment such as fleet operation management systems (FMS), infrastructures and data for business implementation

Approach Policy

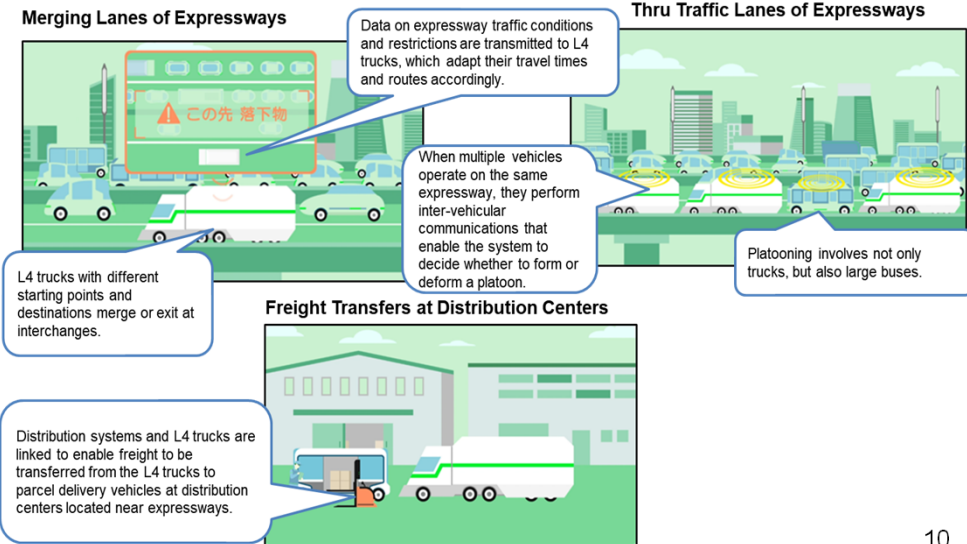
- Development of L4 AD trucks utilizing results of previous demonstration experiments of unmanned truck platooning.
- Development of FMS utilizing infrastructure data that take the needs of large vehicles.

Main Activities

- 2021
 - Evaluation of business models
 - Development of vehicles and systems to evaluate the ODD of L4 vehicles
- ~2022
 - Demonstration, evaluation and establishment of ODD concepts and FMS meeting characteristics of large vehicles
- ~2025
 - Demonstration, evaluation of business models and collaborative driving of multi-brand vehicles
 - Development of systems by private companies



Future Image



Theme 4. Harmonization and interoperability of V2V and V2P communication to achieve L4 in mixed traffic environment

Target

- **Achieve L4 AD services in mixed traffic in diverse areas** using cooperative system by around 2025
- Create a test bed area where the most appropriate cooperative system, which is adapted to the road environments and traffic situations, etc. may be implemented
- Support lower level of automations (L3, ADAS, etc.)

Approach Policy

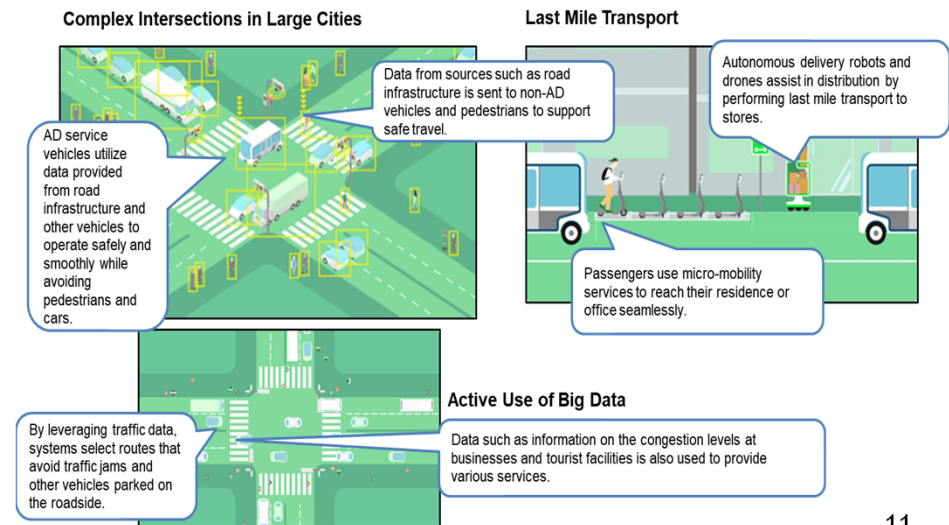
- Cooperative system in accordance with local characteristics based on analysis and study of regional use cases.
- Promote harmonization and standardization efforts based on domestic and international discussions and technology development

Main Activities

- 2021
 - Use cases and business models
 - Study and evaluation of cooperative system
 - Study on data exchange schemes
- ~2022
 - Identifying specification of data exchange schemes
 - Study on standardization and evaluation environment of cooperative system
 - International trend and strategies
- ~2025
 - Technical/service/operational/business viability demonstration
 - Proposal of standardization and harmonization for cooperative system



Future Image





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