

Automated driving level 4 in Japan Initiatives in the Automotive Industry

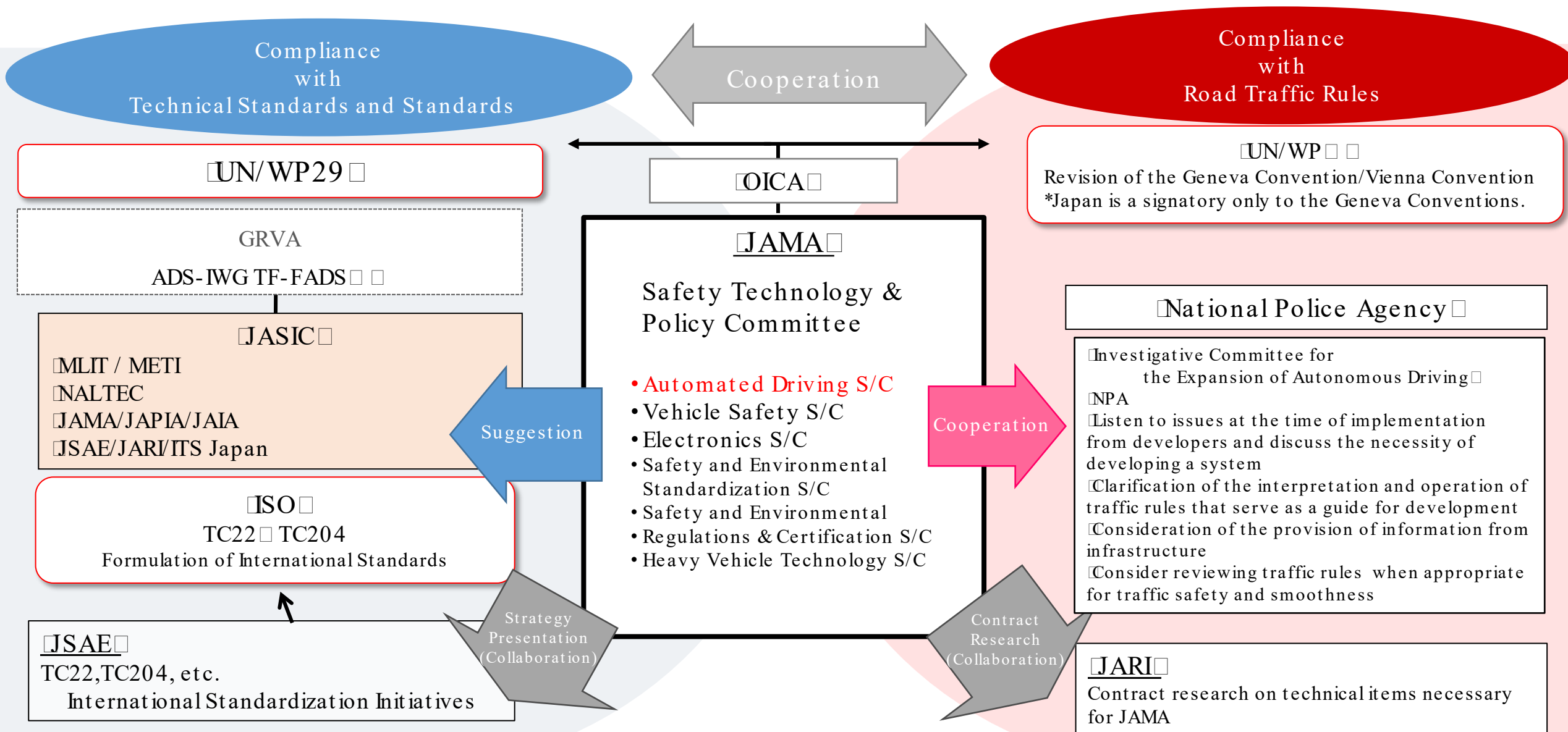
Japan Automobile Manufacturers Association
Safety Technology Policy Committee
Chairman of the Automated Driving Subcommittee


Kunimichi Hatano



Activities of International Regulatory and Standard for Automated Driving and the Position of JAMA

Regulations and Standards in the International Community for AD



- 
- 2023.5** ● **Commencement of automated Level 4 operations under specified conditions.**
 - 2023.4** ○ **Partial revision of Road Transport Act Enforcement Rules and other regulations**
 - 2023.4** ○ **Road Traffic Act, amendment including “Specified Autonomous Operation”**
 - 2020.11** ○ **Automated Driving level 3 Type Approval obtained.**
 - 2020.4** ○ **Amendments to the Road Traffic Act and Road Transport Vehicle Act .**
 - 2018.9** ○ **MLIT: Safety technology guidelines for automated vehicles.**
 - 2018.4** ○ **Outline for the development of the driving environment for automated driving.**

Structure, activities, and examples of the JAMA and Automated Driving S/C

Overall Organization

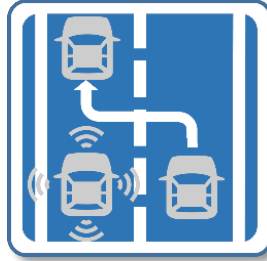
Board of Directors						
Next-Generation Mobility Committee	Safety Technology & Policy Committee	Environmental Technology & Policy Committee	Supply Chain Committee	General Policy Committee	Mobility Show Committee	Motorcycle Committee
Next-Generation Mobility Policy S/C	Vehicle Safety S/C	Environmental Policy S/C	Purchasing S/C	Planning S/C		Motorcycle Planning S/C
Mobility Services Task Team	Automated Driving S/C	Fuel Efficiency S/C	Logistics S/C	Public Relations S/C	Heavy Vehicle Committee	Motorcycle Overseas S/C
Connected Mobility S/C	Electronics S/C	Electric Vehicle S/C	Vehicle Maintenance S/C	Taxation S/C	Heavy Vehicle Planning S/C	Motorcycle Technology & Harmonization Regulations S/C
	Heavy Vehicle S/C	Fuel & Lubricants S/C		Global Business S/C	Heavy Vehicle Technology S/C	Motorcycle International Legislative Strategies S/C
	Traffic Safety S/C	Atmospheric Environment S/C		Intellectual Property S/C		Electric Motorcycle Promotion S/C
	Safety and Environmental Regulations & Certification S/C	Emissions S/C		Research & Statistics S/C	Mini-Vehicle Committee	
	Safety and Environmental Standardization S/C	Noise S/C		Human Resources S/C	Mini-Vehicle Planning S/C	
		Recycling & Waste Reduction S/C		ICT S/C		
		Chemical Substances Management S/C		Project Evaluation S/C		

Note : S/C=Subcommittee
(latest organization change, since Nov. of 2020)

1. AD Safety Assessment Expert group

April 2018~

- Scenario-based safety assessment
- Real world observation DB
- Safety Argument Standards
- Safety Argument Scenario System



4. Expert group on the AD Highway Traffic Law

December 2018~

- Industry-wide interpretation of articles on traffic rules in Japan
- Gathering opinions for the realization of autonomous driving that does not require the presence of a driver

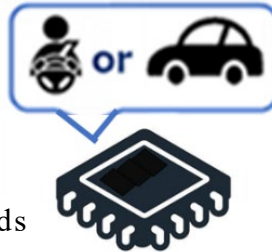


2. DSSAD* Response Study Expert group

June 2018~

*Data Storage System for Automated Driving

- Keeping records of the operating status of autonomous vehicles
- Cooperation with subcommittees related to purpose of use and operation methods



3. Compliance with AD Laws and Regulations Expert group

March 2019~

- Harmonization of WP29 international standards (GRVA, IWG, etc.)
- Compliance with safety guidelines and security standards in Japan

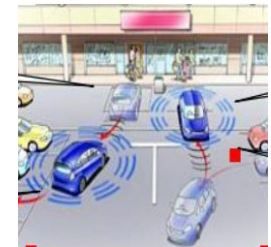


5. AVP* Working group

April 2024~

*Auto Valet Parking

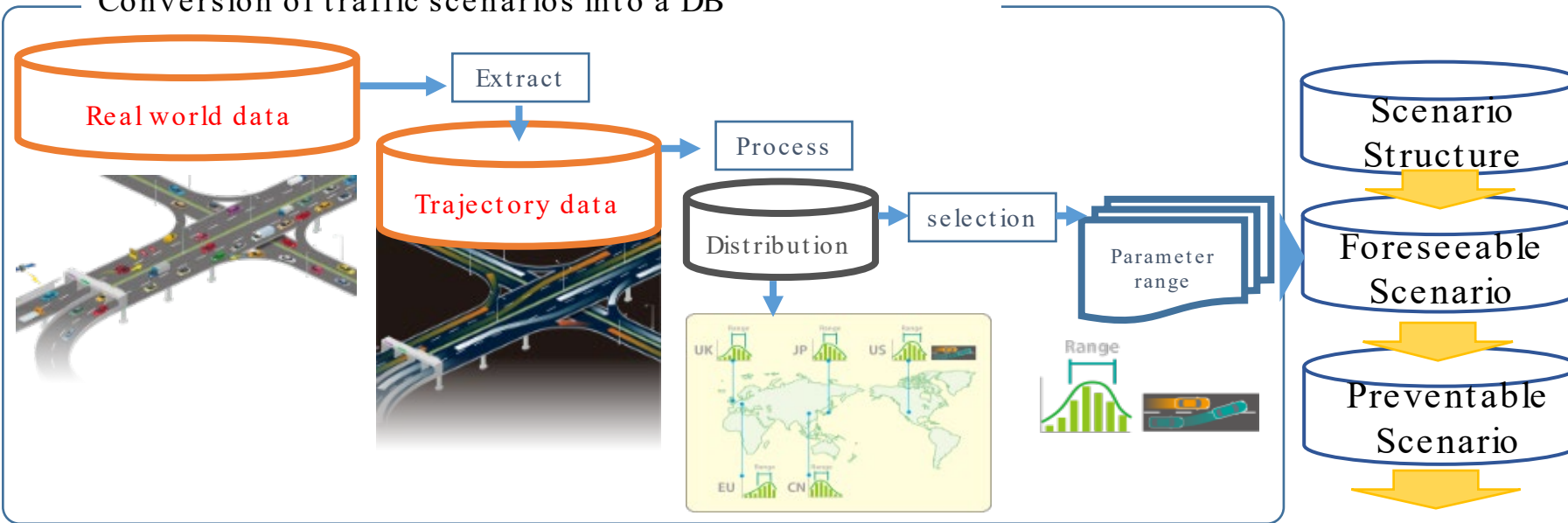
- Functional classification and organization of use cases for AVP social implementation
- Industry's response to the development of systems related to AVP in Japan and overseas



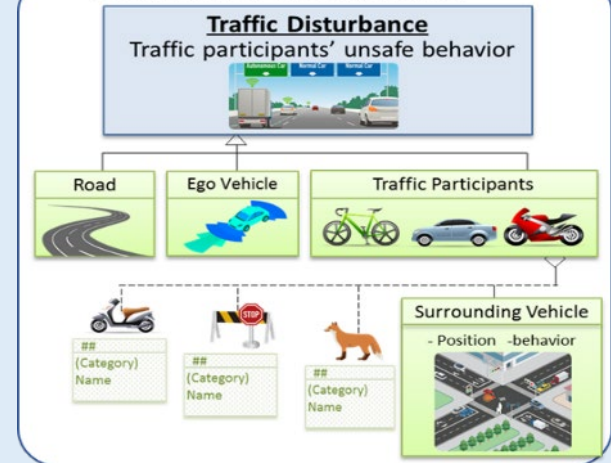
Publication of AD Safety Assessment White Paper

JAMA's best practices based on the actual development process of each manufacturer regarding the safety argument system, safety evaluation method, and safety judgment method for dynamic driving tasks of autonomous driving on Lv3 or higher automated driving

Conversion of traffic scenarios into a DB

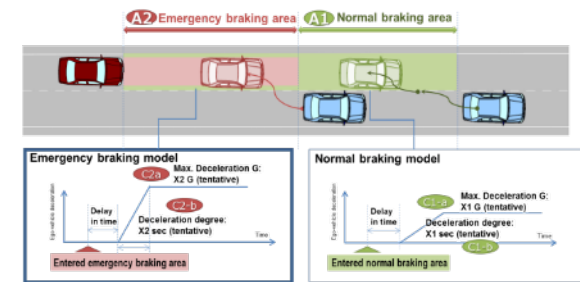


Scenario Structure

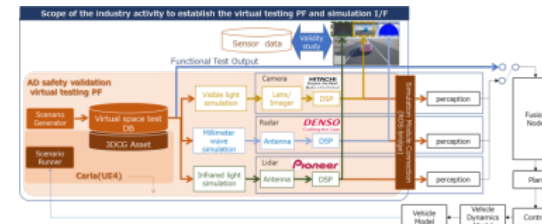


Best Practices for Target Performance

attentive skilled driver and AD Collision avoidance



Establishment of a verification environment



Example of Level 4 automated driving initiatives
by participating companies of JAMA

【Toyota】 Automated Driving e-Palette

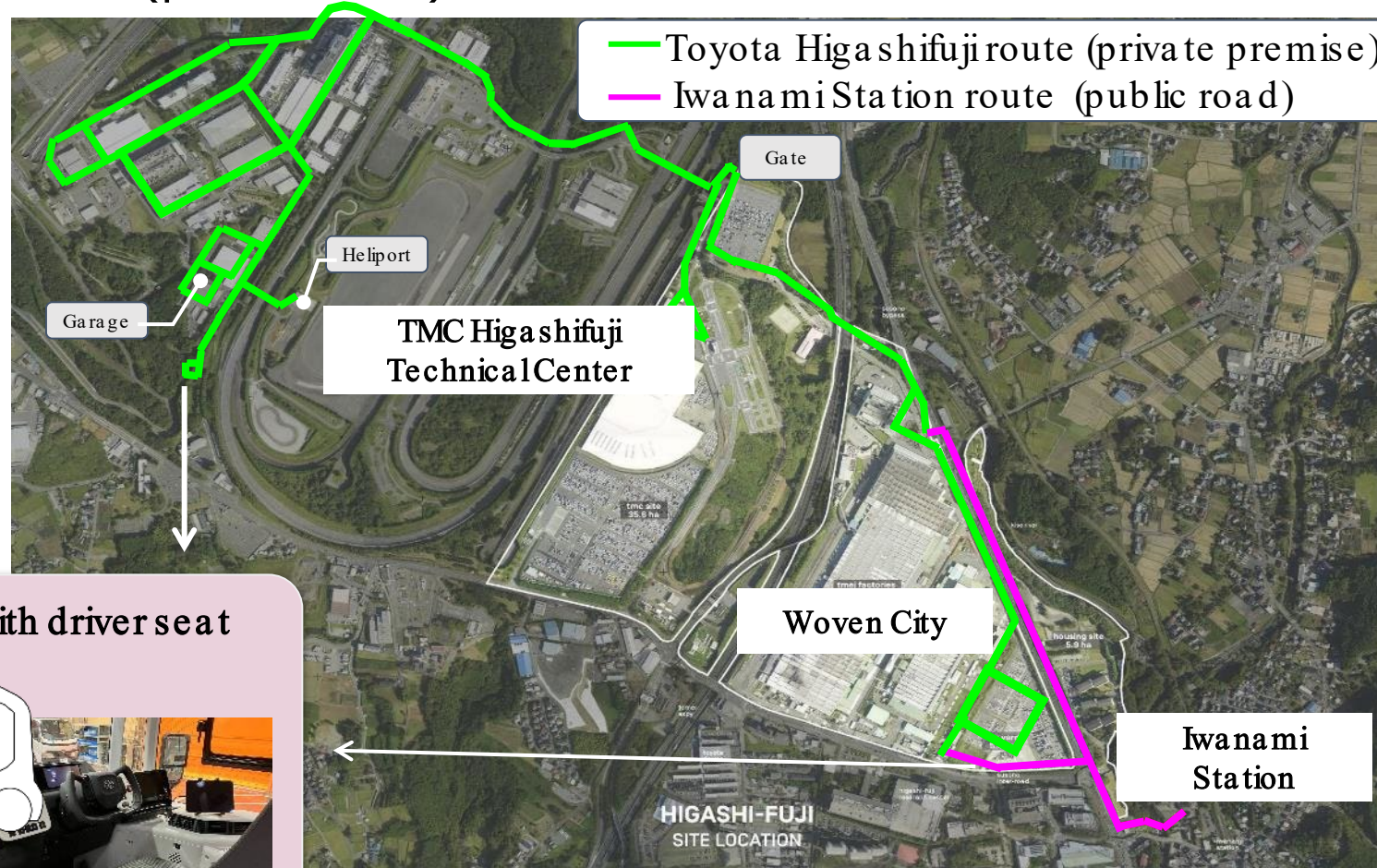
- Electric vehicle platform dedicated for MaaS application



Covers 360-degree surroundings with multiple modality sensors

【Toyota】 Woven City with e-Palette

Covers two routes: Higashifuji Tech Center line (private premise) and JR Iwanami Station line (public road)



e-Palette with driver seat



CI micromobility



Pedestrian-vehicle mixed-environment driving & communication

CI Automated drive



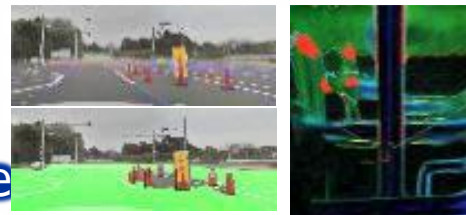
Ordinary road driving



Automated merging on highways



High-precision map-less driving environment understanding

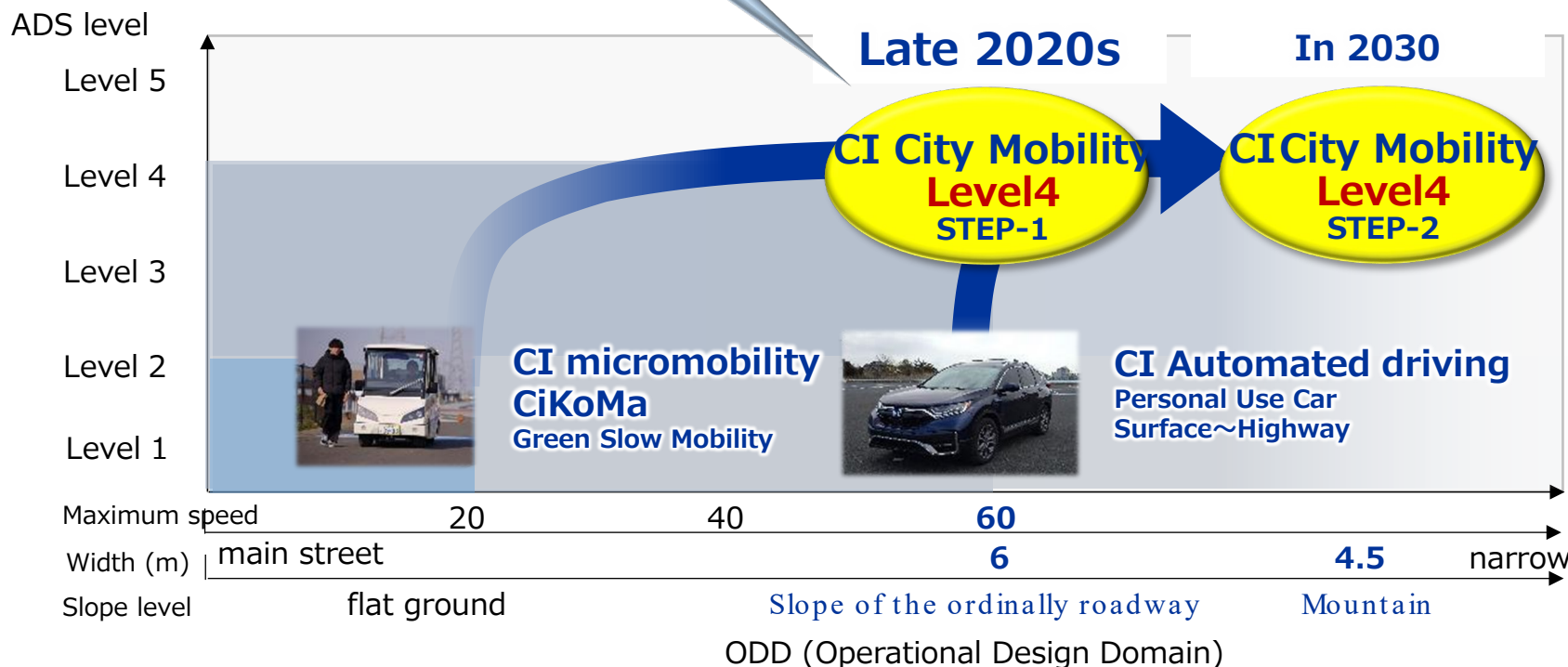


Deadlock-less Cooperative Planning

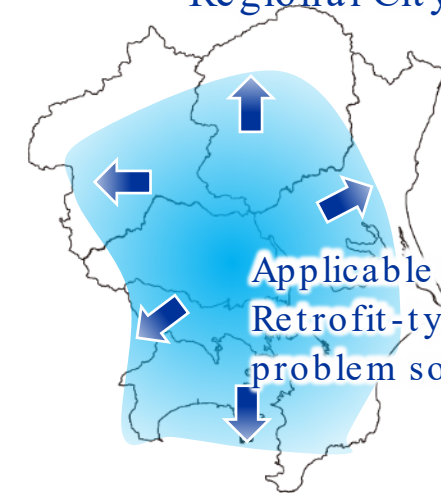


Honda R&D CI micromobility Demonstration Plan

Don't rely on high-precision maps or large-scale infrastructure Easy to apply to different regions Level 4 ADS Technology

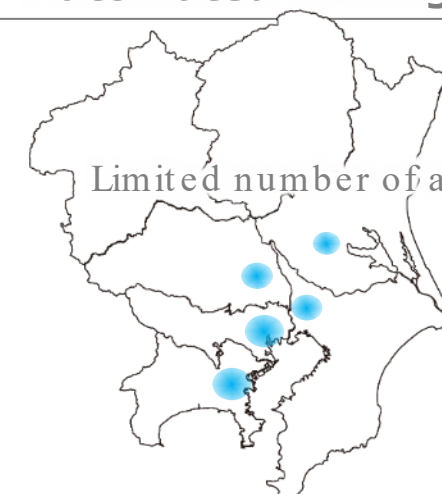


Ordinance Designated City
~ Regional City



Applicable to a wider area
Retrofit-type traffic problem solving

Challenges of Level 4 Automated Driving



Limited number of applicable cities

Technology Demonstration Experiment

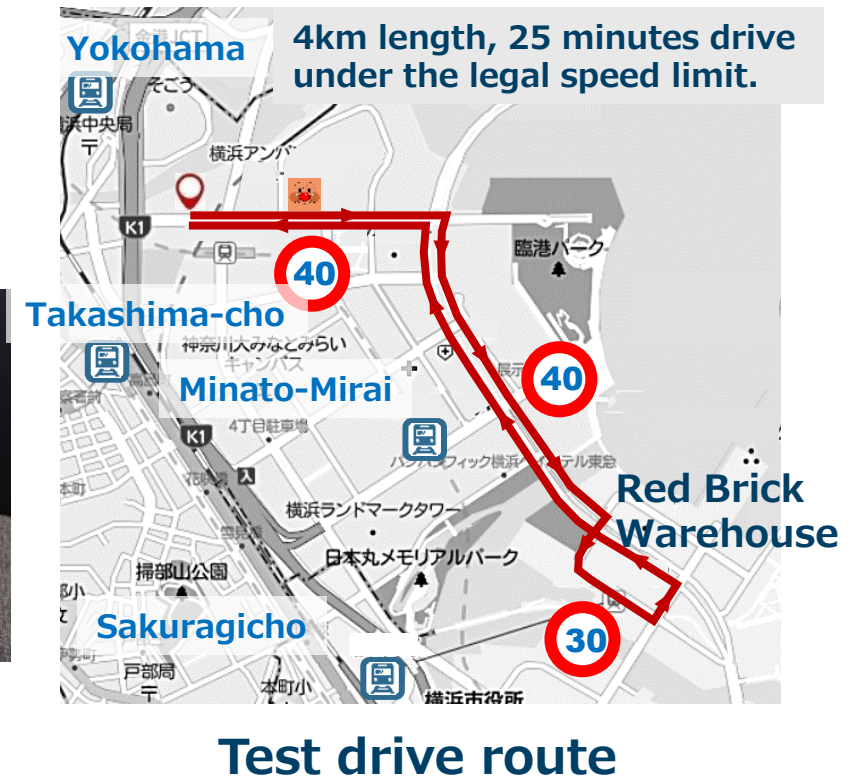
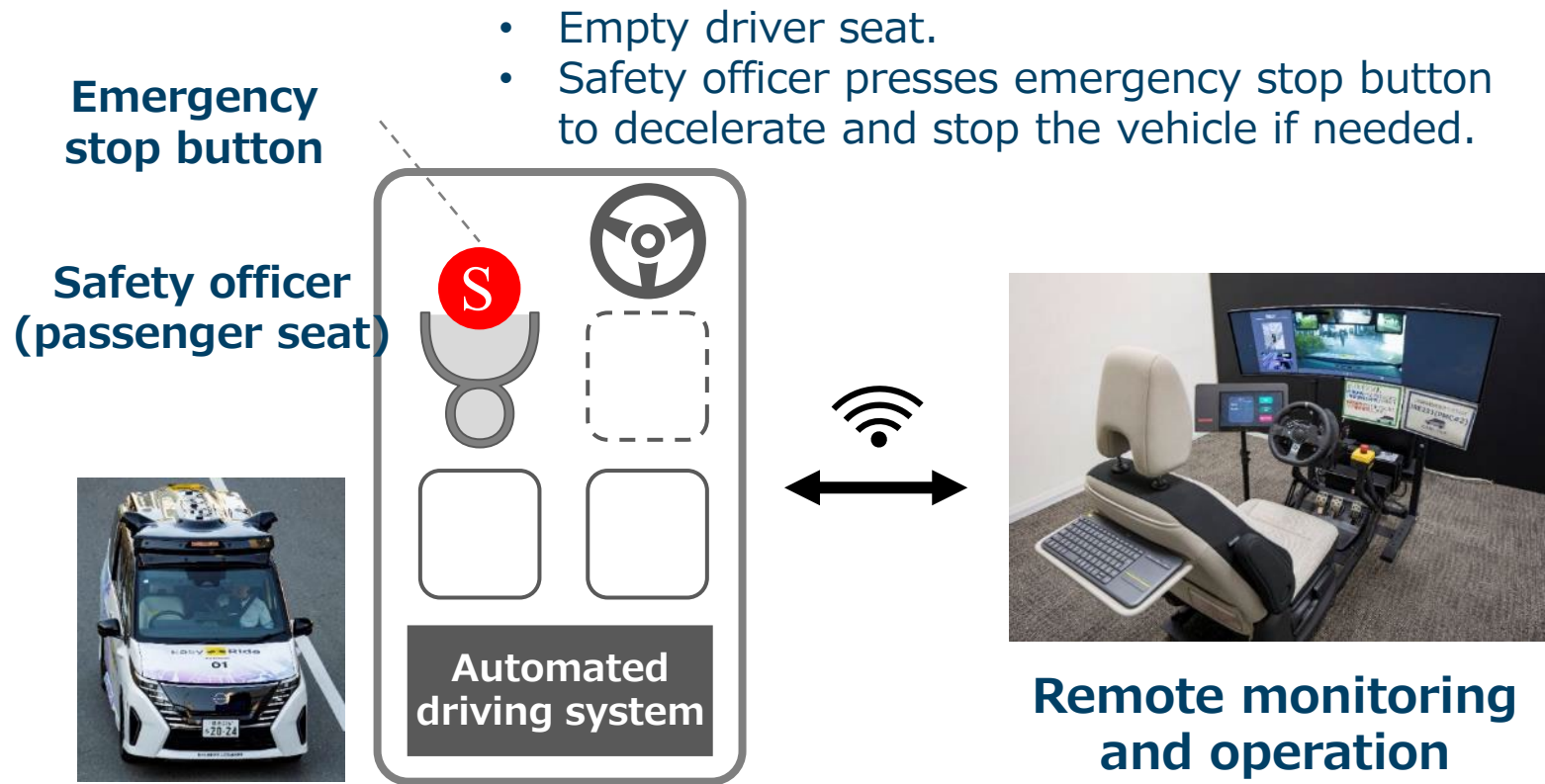


【Nissan】 Driverless test in Yokohama downtown




【Nissan】 Driving test overview (Feb. to March 2025)

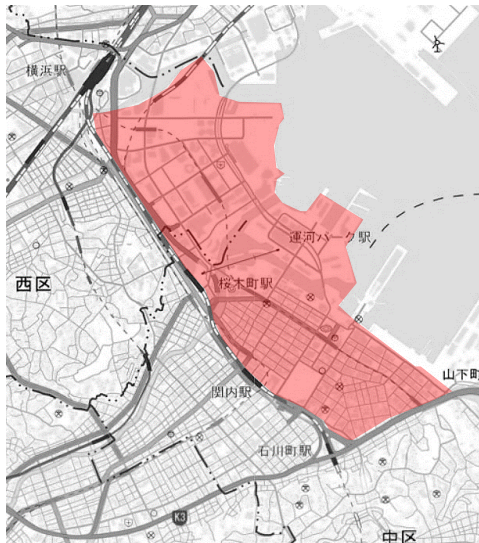
- Driverless test in urban mixed traffic
- Conducted under the scheme of “Remote Automated Driving System”



【Nissan】Driverless mobility service roadmap

- Take three phase to evolve social acceptance, service level and technology in parallel

Fostering momentum for autonomous vehicles			Regional expansion and enhanced acceptance		Service establishment and thriving community	
FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
 Driverless test	Phase 1 : Provide daily mobility service with autonomous vehicles		Phase 2 : Regional expansion and safety validation • Paid service • Expansion to 3 to 4 towns.		Phase 3 : Contribution to prosperity of town by an established service	



- Service-oriented field test to cover central Yokohama region
- Starts from 2025 Autumn.
- Nissan Serena-based test vehicles up to 20.
- Establish eco-system for service operation through large scale and long term test.
- Safety driver on-board (SAE Level2)

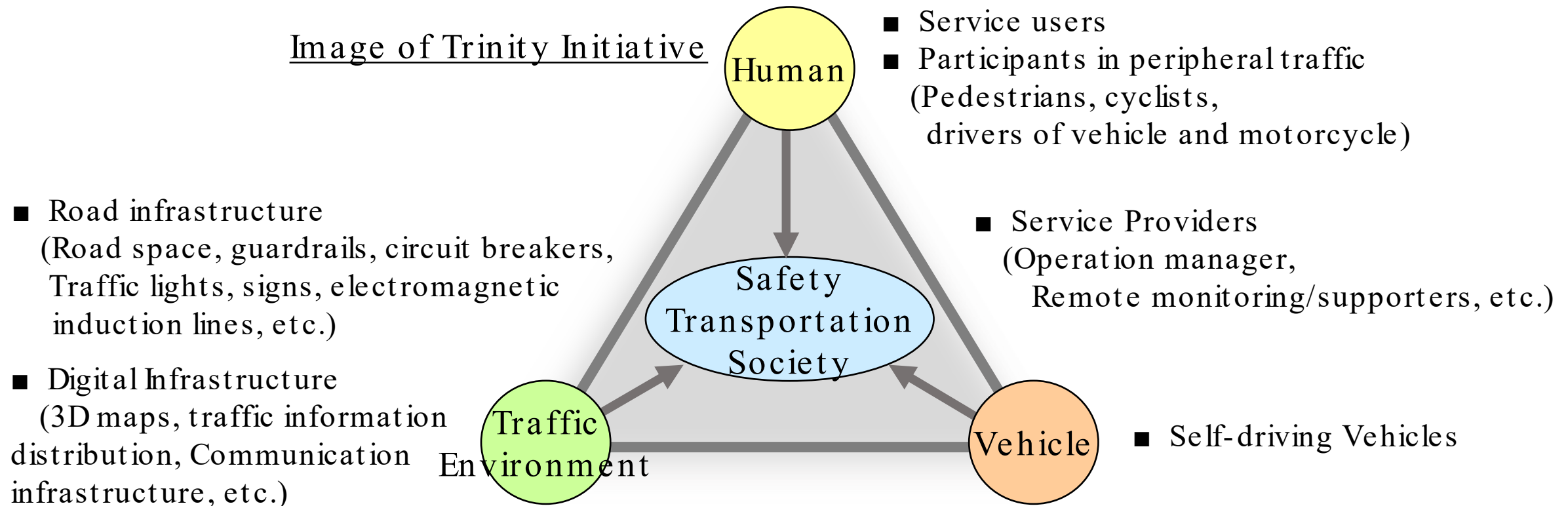
Initiatives for the Social Implementation of Automated Driving Mobile Services by Autonomous Driving TF

Trinity Initiatives for Social Implementation of Level 4 Autonomous Driving

[Autonomous driving TF including consideration of business domains]

- In order to implement autonomous driving more widely in society while giving top priority to safety, it will be important not only to focus on the technology of "vehicle" so far, but also to work on the "trinity" in cooperation with "human" and "the traffic environment."
- To this end, it is necessary to identify issues that need to be solved for each of people, vehicles, and the traffic environment, and then compile an action plan to promote the trinity initiatives

Image of Trinity Initiative

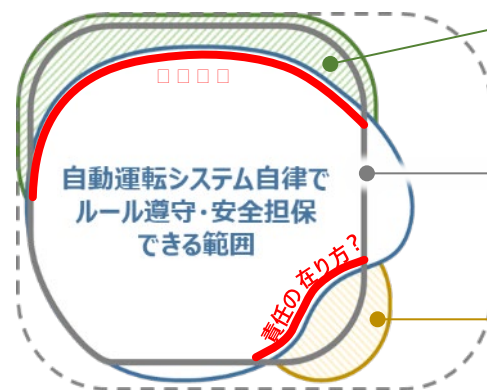


Overview of the issues facing Level 4 autonomous driving and positioning of issues

	Human		Vehicle	Traffic Environment	
	Other Road Users	Service Provider		Physical Infrastructure	Digital Infrastructure
Policy Issues	Examining the future of mobility services using autonomous driving Clarification of the roles that Human, vehicles, and the traffic environment should play				
	Fostering Social Acceptance and Behavior Change for Autonomous Driving Mobile Services	Expansion of autonomous mobile services (Government target: 50 by FY2025 and 100 or more by 2027)		How to develop the infrastructure necessary for autonomous driving mobile services	
				Ensuring safe road space	Ensuring secure data space
Institutional Issues	Responsibilities in the event of an accident according to the roles to be played by human, vehicles, and the traffic environment/Framework of legal liability				
	Formulation and review of knowledge, rules, manners, obligations, etc. necessary for traffic participants	Establishment of an approval system for autonomous driving mobile services based on the Road Traffic Act Establishment of a system for transportation safety using autonomous driving under the Road Transport Act	Formulation of Permit and Approval Standards for Unmanned Autonomous Driving (System Safety, Special Equipment Vehicles)	Review of the system according to the technical level and actual conditions	Measures to ensure the reliability of digital infrastructure
Technologies /Businesses Issues	Fostering Social Acceptance and Behavior Change in Areas Where Autonomous Driving Mobile Services Have Been Introduced	Establishment of an operation system that covers the functional limits of autonomous driving systems	Development and Evaluation Methods for Safe Autonomous Driving Systems Clarification of functional limits of autonomous driving systems	Setting and categorizing driving environment conditions according to autonomous driving systems	
				Optimization of road specifications	Examination of specifications of digital infrastructure (signal information distribution, HD maps, communication methods, etc.)

Sharing issues and clarifying the way of thinking about who is responsible for the realization of autonomous driving

Sharing the concept of service implementation based on trinity safety measures



Ensuring safety through infrastructure development and cooperative systems

- Ensuring the public nature of infrastructure (traffic light reliability, road maintenance, etc.)
- Clarification of functional arrangement and demarcation of responsibilities with the cooperative system is a premise.

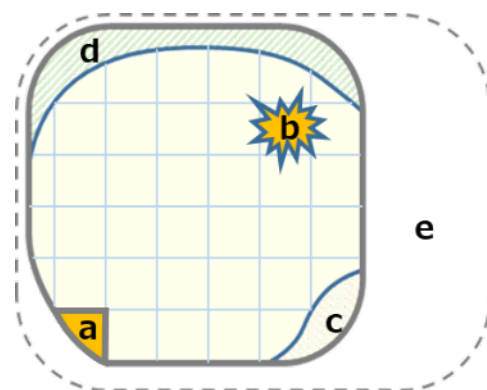
Service Coverage Area (Operating Conditions and Scope)

- Operators/manufacturers should inform users / regions of the limits of autonomous driving, etc.
- It is necessary to properly disseminate information

By complying with the rules of human (participants in surrounding traffic), etc. Ensuring safety

- If pedestrians and cyclists comply with the rules, many accidents will be reduced.
- What is the nature of responsibility in the event of an accident according to the role to be played?

Concept of incident response such as service failures and cyber security



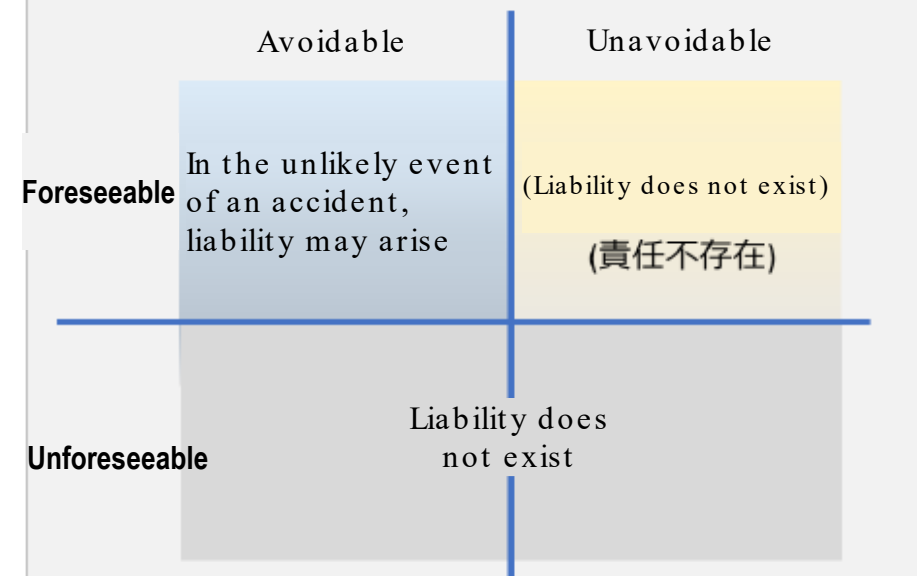
In some cases, it is necessary to clarify the cause of an incident that occurred after the start of the business(after examination and approval) and how to proceed with the responsibility

- Case a) After the business launch, service trouble apparent
- Case b) Incidents of other liability, such as cyber security
- Case c) When the safety measures of human (participants in the surrounding traffic) are insufficient.
- Case d) When there is a defect in the safety response by the infrastructure
- Case e) When the service scope is exceeded unexpectedly

- Defects in system design and verification □ Recall
- Missing out on the screening criteria? □ Is it necessary to revise the system?
- Is it necessary and how much of the service will be suspended during the countermeasure period?

The idea of the relationship of responsibility (criminal) was presented.

Accidents related to autonomous vehicles and criminal liability, etc.



Future Discussion

- Clarification of Responsibilities (Including what would have been known to have been foreseeable)
- Unavoidable Cases Policy
 - Implementation of Safety Regulation and Guidelines
- ※ Negligence in civil liability shall also be subject to the above arrangement. However, in each specific case, the judgment of foreseeability may differ from that in the case of two criminal offender

Mobility Roadmap 2024 Timeline

Timeline and stage	Short-term initiatives Comprehensive Project Demonstration (FY2024)	Medium-Term Initiatives Proactive commercialization (FY2025~FY2026)	Long-term Initiatives Full-scale commercialization (from FY2027)
Initiatives to focus on	<ul style="list-style-type: none"> •Proficiency and sophistication of technologies for the commercialization of autonomous driving •Ensuring transparency and fairness in screening procedures to accelerate the commercialization of autonomous driving •Improving business acceptance by utilizing new technologies such as autonomous driving (necessity, safety, cost burden) 		
Establishment of a business model	<ul style="list-style-type: none"> 需要を推定する方法の検討（デジ） 事業採算性の検証（経産／国文） 自動運転システムの開発支援（経産） 資金調達の支援方策の検討（デジ） 地域の関係者の共創推進や柔軟な公的支援制度の検討（国文） 地域の公共交通リデザイン実現会議 東横・横浜のための集約拠点の整備（経産） ・アーリーハーベストP3を通じた詳細検討 デジタルライフライン全国創設支援計画 東横・横浜等のための集約拠点の整備（経産） ・アーリーハーベストP3における検討結果を先行地域以外へ横展開を検討 主要技術の低コスト化（経産） ・地固の低コスト化等 自動運転サービス等の導入に向けた指針の策定（内） ・計画指針書の作成 主要技術の低コスト化（内） ・ライダーの設計試作 自動運転車両のリース・レンタルを促す仕組の検討（デジ） 参考となる事例の共有（官民／デジ） ・模倣革新に資する自動運転車両の活用に係る取組等 自動運転がもたらす効果の評価方法の検討（国文） 参考となる事例の共有（官民／デジ） ・模倣革新に資する自動運転の積極的活用等 		
Establishment of technology	<ul style="list-style-type: none"> 路車協調システムの検討（国文） ・検証開始 V2X通信規格の検討・策定（総務） ・検証開始 V2N通信環境の検討（総務） ・実証・検証開始 自動運転サービス支援道の整備（経産） ・アーリーハーベストP3を通じた取組の開始 データの統合・相互利活用基盤の検討（内） ・プロトタイプ開発 デジタルライフライン全国創設支援計画 安全性評価環境の構築（経産） 混在空間における協調型システムの検討・確立（経産） 複数モビリティの協調制御技術の検討（デジ） 信号情報提供技術の検討・確立（警察） ・実証環境の構築 信号情報提供技術の検討・確立（警察） ・信号情報の活用可能性検討 		
Establishment of systems and rules	<ul style="list-style-type: none"> 社会受容性向上のための手引きの策定（経産／国文） 走行空間の検討（国文） ・実証開始 審査手続の透明性・公平性の確保（警察／国文） ・取組に関する文書のとりまとめ、着実な取組の実行 モビリティサービスをけん引する人材の育成（内） ・人材育成プログラムの作成 モビリティサービスをけん引する人材の育成（内） ・人材育成プログラムの整備 走行空間の検討（国文） ・とりまとめ 審査手続の透明性・公平性の確保（警察／国文） ・とりまとめ文書の逐次改訂による審査手続の更なる利便性向上と効率化 モビリティサービスをけん引する人材の育成（内） ・人材育成プログラムの整備 自動運転をめぐる社会的ルールの明確化（※詳細は次ページ参照） 		

Cooperation between the Automated Driving S/C and JASIC on Regulatory and Standards

(1) Confirmation and update of roadmap and milestones for expanding the spread of autonomous driving in Japan

Reflect the latest situation in Japan and overseas and clarify what needs to be prepared by what time and for what purpose.

- Criteria and examination that can withstand widespread use. • By 2027, which is the government's target.
- For the sustainable development of public transportation in Japan.

Reflect on the mobility roadmap promoted by the Digital Agency and encourage annual revisions, as necessary.

Incorporating Japan's goals into TF activities

↑ If there are any deficiencies, encourage revisions as necessary.

(2) Understanding and responding to domestic/international trends in criteria and examination for ADS dissemination

Currently, Level 4 demonstration experiments are approved through individual examinations, but since it is expected that the number of examinations and regions will be diverse in the 2027 cross-section, we will understand how the unification of test protocols will progress in Japan and overseas. Standardization will be considered as necessary for quantification and indexing of predictability and avoidability.

(3) Discussion on the necessity of legislation that covers new structure autonomous driving. and clarification of jurisdictional divisions.

- | | |
|--|--|
| <input type="checkbox"/> Assumed Functions | <input type="checkbox"/> Necessary regulations |
| <input type="checkbox"/> Driverless vehicles | <input type="checkbox"/> Safety standards for driver-less vehicle |
| <input type="checkbox"/> Remote (monitoring) | <input type="checkbox"/> Technical standards for remote device |
| <input type="checkbox"/> ITS collaboration | <input type="checkbox"/> Standards for outside vehicle system |
| <input type="checkbox"/> Expansion of SU | <input type="checkbox"/> Standardization of process authentication and SMS |

Proposals for international discussions so that there are no differences between international and domestic

↑ International progress and the activities of the automated driving center. Check each time if there are any differences

(4) Securing Japan's advantage in the formulation of UNR/GTR and maintaining harmonization

Taking into account the timing of the formulation of the UNR/GTR (assumed for June 2026) and the timescale of the government's target (100 locations by 2027), the action plan will be made so that the activities of (1) ~ (3) can be discussed internationally without omissions.









Roadmap for Regulatory & Standard Collaboration TF for Social Implementation of LV4 ADS



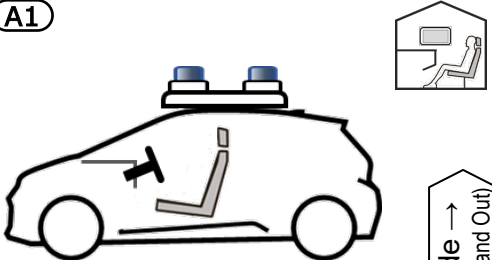
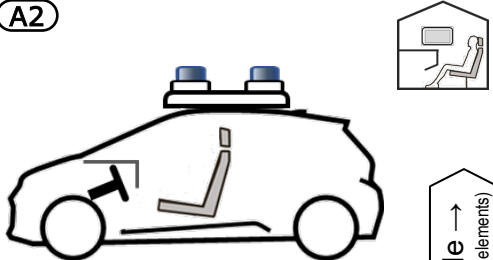
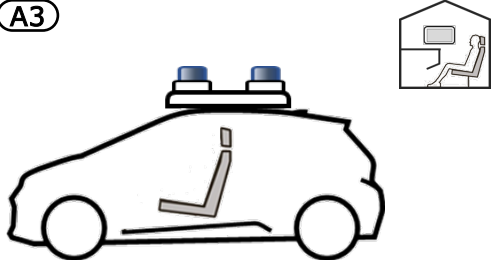
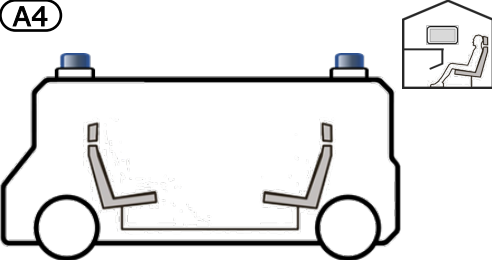



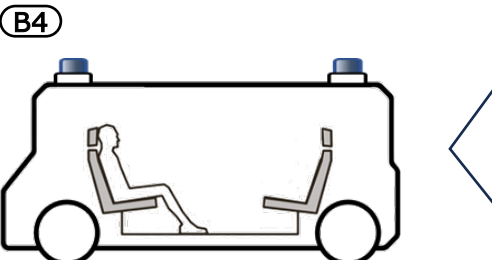
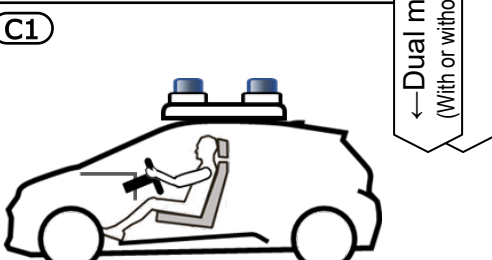
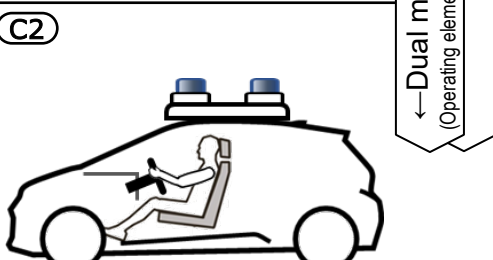
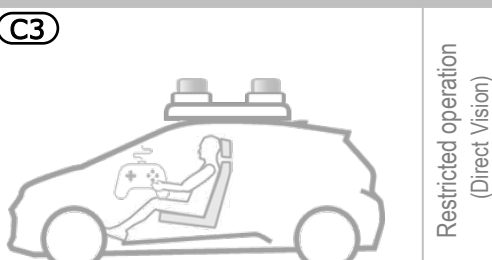

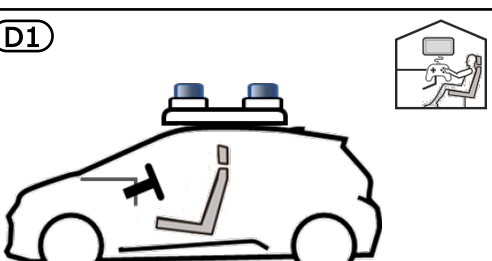
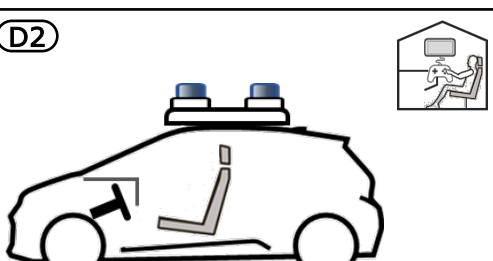
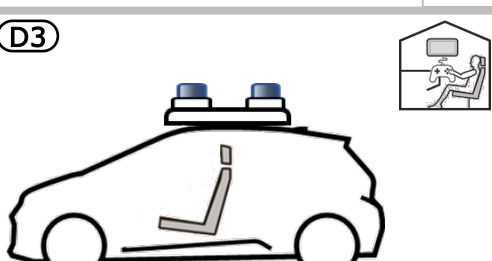
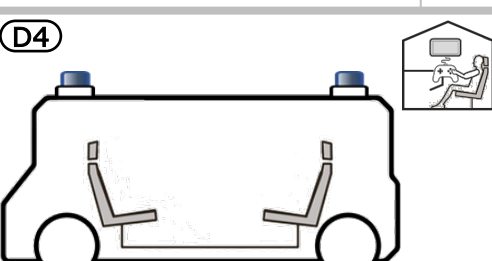
JAPAN AUTOMOBILE STANDARDS INTERNATIONALIZATION CENTER

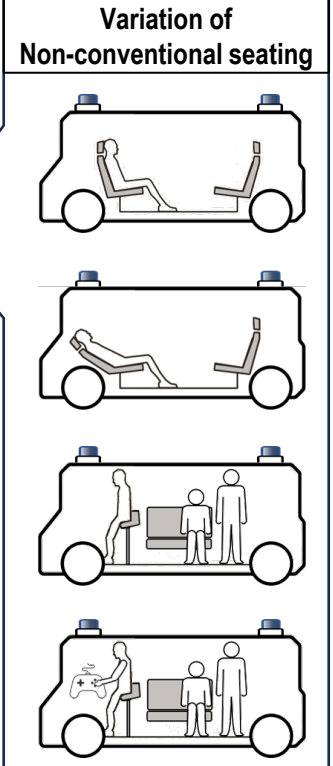
Target: In line with the Japan government's target for driverless ADS, with an eye on the development of systems in Japan, UNR/GTR 26/6 WP29 Contributing to legislation in cooperation with the standardization side

service	Implementation image	use	Identification of issues under the current system				Standards and standards Consideration of whether or not to respond as a link	Specific Action Plan (tentative)								
			space	ADS Category		function arrangement		vehicle structure	2024		2025		2026		2027	
				application	structure											
Autonomous buses Self-driving taxis		Commercial	mixture		ADS-DV	remote Monitoring & Support Remote HMI Road-vehicle coordination	Special Equipment Automotive	With a 26-year target, there are efforts to implement it in society with a dedicated vehicle for autonomous driving Clarification of domestic needs, consideration of reflection in UNR/GTR, and organization of system requirements for remote HMI	TF-FADS★ Proposed Amendments Functional layout of vehicle, exterior and infrastructure Trends in Japan * Driverless domestic support WG considers domestic and international collaboration Mainly supports FADS without an operator	UNR/GTR★ New ADS Standards About unmanned vehicles in the car Organizing Safety Standards and Standards Special Equipment Automotive Establishment of Domestic Examination Standard			Driver less ADS★ New Domestic Standards			
BRT		Commercial	management		ADS-DV	Remote Monitoring V2X		Aiming for social implementation in 25~27 years Reflecting the results of studies on road-vehicle coordination (infrastructure coordination) in TF VC	TF-VC's ITS Integration Standards Summary of domestic needs Reflected in TF-VC	Remote to roadside equipment Reflecting Domestic Needs		The plan is tentative. Domestic movement in line with the ITU base				
AVP Managed		Commercial	management		ADS-EqV	Remote Monitoring Facility Coordination		The standard has already taken precedence, and there are examples of implementation in Europe, and there is a high possibility that it will be covered by UNR/GTR. Domestic initiatives (JAMA) have just begun.	Summary of domestic needs ADS IWGへ反映	About APV Organizing Safety Standards and Standards Special Equipment Automotive Establishment of Domestic Examination Standard						
AVP Autonomous		Private	separation		ADS-EqV			It is positioned as an entry for the practical application of L4 for private use, but there are no specific examples of efforts. For private L4, the legislation has not been completed (it does not fall under the category of specified automated operation).	Identification of domestic needs Standard Trend Monitoring							
There is no logistics on the highway		Commercial	separation Highway		DM-ADS	Remote Monitoring V2X		Although standards for platooning exist, it is necessary to confirm the need for domestic standards and standards to be coordinated in order to formulate standards and standards for road-vehicle coordination	Summary of domestic needs Reflected in TF-VC	Standards and Standards for Roadside Equipment : Reflecting Domestic Needs		The plan is tentative. Domestic movement in line with the ITU base				
Highway Autonomous Driving		Private	separation Highway		DM-ADS		Steering retract	Functional standards for expressways, private use, and L4 have begun to be formulated from Europe, but there is no discussion on steering storage. Needs to be monitored to see if it is subject to UNR/GTR	Accompaniment to the formulation of standards and Monitoring trends in the new UNR/GTR standards							

Structural classification of autonomous vehicles ADS-DV: A vehicle dedicated to driverless autonomous driving with no operator ADS-EqV: A vehicle equipped with an autonomous driving system and the vehicle itself has a conventional structure.

Operational classification of autonomous vehicles DM-ADS: A vehicle that can switch between autonomous driving and driver-driven driving (pedals and steering wheel can be retracted, etc.)

		The driver's seat is still present as before.		There is no explicit driver's seat as in the past.	
		Conventional driver's seat and operating elements	Driver's seat and retractable operating elements	No conventional operating elements	New and/or dedicated vehicle structure
Automated driving	Remote monitoring	(A1) 	(A2) 	(A3) 	(A4) 
	Stand-by in the vehicle	(B1) 	(B2) 	(B3) 	(B4) 
Non-automated driving	Direct operation	(C1) 	(C2) 	(C3) 	(C4) 
	Remote operation	(D1) 	(D2) 	(D3) 	(D4) 



* In all modes, the direction of travel of the vehicle is left.

The following activities were introduced as part of the Japanese automotive industry's efforts to achieve Level 4 autonomous driving

1. Activities of International Regulatory and Standard for Automated Driving and the Position of JAMA
2. Structure, activities, and examples of the JAMA and the Automated Driving S/C
3. Example of Level 4 automated driving initiatives by participating companies of JAMA
4. Initiatives for the Social Implementation of Automated Driving Mobile Services by Autonomous Driving TF
5. Cooperation between the Automated Driving S/C and JASIC on Regulatory and Standard

The Japan automobile industry is contributing to the development of international regulations, standards and domestic legislations by identifying and sharing issues from multiple perspectives through the Automated Driving S/C Autonomous Driving TF with the participation of the JAMA, and actively collaborating with relevant ministries for the social implementation of mobility services using Level 4 automated driving

Thank you for your attention