

Distr.: General
30 November 2023

English only

Economic Commission for Europe

Inland Transport Committee

Global Forum for Road Traffic Safety

**Group of Experts on drafting a new legal instrument
on the use of automated vehicles in traffic**

Seventh session

Geneva, 30 Nov -1 Dec 2023

Item 3 of the provisional agenda

**Industry view on gaps that need addressing and approach
towards bridging these gaps to progress GE3 work
programme.**

Submitted by the representatives of OICA and CLEPA

I. Background

OICA and CLEPA welcome the invitation to attend and contribute to the work programme of GE.3 (Group of Experts on drafting a new legal instrument on the use of automated vehicles in traffic) since its 3rd session in May 2022.

At its 3rd session, Industry presented Informal Document 5 (GE.3-03-05) and its supporting document, Presentation 4, outlining the challenges related to traffic laws in the context of automated vehicles and the administrative and procedural aspects about ADS operation from an industry perspective.

Industry emphasised on the need to harmonize traffic rules and signage, in support of an increased level of harmonization that would reduce complexity related to the development of ADS in a subsequent GE3 session in September 2022, additionally voicing support in responding to any requests for clarification with respect to the future drafting activities.

In preparation for the GE3 sessions, Industry has continued to contribute its expertise, earlier as part of the Group of Drafting Volunteers and more recently, as part of the GE3 Subgroups 1 and 2 since their inception in May 2023 at GE3's 6th session.

Industry presented Presentation 5 at GE3's 6th session, providing additional considerations and views on the assessment activities towards developing a new legal instrument. Most notably, industry has suggested the GE3 experts to prioritise traffic rules beyond the dynamic driving task that have an impact on road traffic safety as part of this assessment in addition to emphasizing the need for a continued exchange between WP.1 and relevant expert groups in WP.29.

Industry welcomes the comprehensive consultation as part of the GE3 subgroups and the opportunity to share its experience in the two key focus areas of roles and responsibilities of the user in context of when an automated driving system (ADS) is engaged and the conditions for when the driver (if applicable) can delegate the dynamic control to the ADS.

Considering the recent developments within the GE3 subgroups, OICA and CLEPA present this paper to provide an industry perspective on gaps that need addressing and corresponding approach towards bridging these gaps, whilst complementing the work being done at WP.29 in parallel.

II. Industry perspective on the current approach

Road traffic acts belong to national legislation. In some states the legislation competencies are not centralised but regional and/or local regulators can issue additional rules considering their specific local needs. Therefore, road traffic acts are very fragmented. Often the adjustment of domestic traffic acts is a complex and lengthy process following from the adjustment of modern traffic, sometimes triggered by technological innovations (e.g., mobile phones).

Harmonization of the national Road traffic acts is achieved by the efforts and work of the Global Forum for Road Traffic Safety (WP.1)The discussion between the Member States resulting in the Geneva Convention in 1949 and the Vienna Convention in 1968 facilitated a common understanding allowing humans to participate in traffic abroad by agreeing on certain rules on how participants shall behave in traffic, ensuring the competencies of driver and allowing for exchange of information between the relevant authorities.

In particular, conventions on road traffic are laid out to achieve the following –

- (i) Facilitate international road traffic through the adoption of uniform traffic rules.
- (ii) Details the basic conditions for the admission of vehicles and drivers in international traffic.

With special regard to the behavioural rules, it is important to note that the conventions only set out basic rules (e.g., keeping minimum distance, securing an accident site). Neither the Geneva nor the Vienna Conventions decide on the liabilities when the behavioural rules are not obeyed by the driver or other road participants. This is because of various reasons:

(a) “The rules of the road (Chapter II) included in the Geneva and Vienna Conventions and agreed in substance by the contracting parties ~~and~~ are implemented by national jurisdictions. *driver and therefore the ADS is required to follow the rules of the road as implemented by the territory within which they operate.* Without official implementation in a given territory, the rules agreed in the Conventions are not applicable in this territory. In this regard, and in case of improper implementation, there is no difference between a Convention and a Resolution.

(b) The national implementations of the Vienna and Geneva Convention are often more specific compared to the behavioural rules set out the Conventions. For instance, the need to secure an accident site can be achieved in various way. In some countries, the warning lights are sufficient, some countries require placement of one warning triangle in some countries two warning triangles are required.

(c) If the national implementations of the Vienna and Geneva Convention stay with the broad wording of the conventions (e.g. keeping minimum distance), the national courts specify these broad legal terms by case law taking into account the specific circumstances of the case whereby different legal requirements are formed.

(d) Obeying to a certain traffic rule is only one factor in deciding liability amongst various considerations. To decide on the overall responsibility of a traffic accident, further information is needed, e.g., on the surrounding environment (such as information on the movements of other road users). For instance, most jurisdictions allow to deviate from explicit rules in emergency situations. In addition, local jurisdictions often have developed their own concepts for assigning liability in unclear cases. A common approach is a strict liability of the owner covered by a compulsory insurance balancing the interests in a fair and socially accepted manner. Thus, it is solely in the remit of the domestic legislators to decide whether the established liability regime is flexible enough to adapt to changes introduced by autonomous vehicles.

For the above reasons, the new legal instruments on automated vehicles (LIAV) will neither be able nor be required to decide on domestic liability issues whatever legal form it may take. Thus, the work of the sub-group can only decide on responsibilities when agreeing new behavioural traffic law, new competencies, or new duties on exchanging information.

Before establishing new rules, a clear gap analysis is needed on what is already covered by the existing conventions and resolutions.

From industry’s point of view the activities related to the performance of the dynamic driving task are clearly assigned to the ADS system when it is activated and engaged.

Many questions and considerations raised in the subgroups evolved around technical issues. Those issues are being discussed by WP.29 as part of its work programme. Industry would recommend that the subgroups build on this work, focusing on safeguarding road traffic safety for automated vehicles in the context of the wider ecosystem.

We propose that the main work of the WP.1/GE.3 therefore focuses on issues in connection to traffic safety beyond the DDT such as :

- (i) Evaluation of tasks beyond the DDT for vehicles with an ADS.
- (ii) Consensus between states or countries on establishing a clear mechanism to permit automated vehicles whilst streamlining processes to be as efficient as possible.
- (iii) Consensus about data exchange and related data storage time.
- (iv) Identifying the current challenges in enabling cross-border operation of AV vehicles via mutual recognition and working to reach an agreement on them.

III. Industry Perspective : Gap assessment in the GE3 Subgroups

Questions raised within the Sub-groups enhanced common understanding about the national approaches taken so far. However, the output generated might not be giving an overall picture about what are the relevant gaps when deploying the existing Conventions and resolution in cross-border situations.

We provide below a summary of the industry submission to the subgroups work so far. We also provide our detailed submission as an annex to this submission.

a) Conditions for transferring control to an ADS.

Delegation of the dynamic control and (de)activation of the ADS cannot be determined freely but the ADS must first detect a specific set of operating conditions. It is true that these conditions can be relatively more complex in urban environments, however the technical conditions for the transfer of control in all situations are being covered by WP.29.

The conditions for transferring control are being developed at WP.29 and have already been developed for UN R 157 (Automated Lane Keeping Systems). For GE3, it would be beneficial for the gap analysis activity to consider the creation of a provision that addresses the existing divergence across national jurisdictions on allowing a human behind the wheel to delegate the dynamic driving task to the ADS.

b) Roles and Responsibilities of the driver

When the ADS is engaged, not all the responsibilities that are traditionally assigned to the driver will still apply and there is a need to consider how existing obligations in the present road traffic rules with a focus on human behaviour can be fulfilled without human presence.

Driver responsibilities can be broadly divided into two key categories – those associated with the dynamic driving task (DDT) and those beyond it.

Responsibility for the DDT: During the time in which the ADS is activated and engaged, the driver does not have any role in the performance of the DDT, which is the sole responsibility of the ADS. The key responsibilities related to the DDT performance, including compliance to traffic rules are transferred to the ADS and form a part of the work programme of WP.29/GRVA.

Responsibilities beyond the DDT: Attributing responsibilities beyond the DDT (e.g. driver duties to ensure traffic safety at the site of the accident such as placing a warning triangle, claiming insurance, roadworthiness, maintenance etc.) would depend on factors such as the use case of the ADS feature(s) and ownership model. National implementation of the Convention often requires the presence of a human for these tasks. New mechanisms or solutions may exist with automated vehicles and GE3 can streamline these in a potential new legal instrument.

The concept of ADS responsibility for the DDT is relatively well defined. We propose that GE.3 focus on the gaps related to responsibilities beyond the DDT in the existing WP.1 framework to ensure road traffic safety.

c) New entities and responsibility concepts

Responsibilities are subject to the national legal framework. There are differing responsibility concepts and government structures across national laws/frameworks, which may lead to ambiguous or conflicting traffic laws creating confusion and issues in legal interpretation. It is important that new roles and entities are clearly defined and clarified.

We propose that where possible GE.3 focus on harmonising responsibility concepts to ensure consistent interpretation of road traffic laws through streamlined government structures and processes.

d) How can responsibility for the dynamic control be determined?

Determination of responsibility is important for understanding who was in control at a given point in time, to inform the discussion on liability. WP.29 considers data recording a suitable concept and the records/timestamps from the Data Storage System for Automated Driving (DSSAD) can be used to determine who is in control of the DDT at any certain time. However, there are aspects of data recording that are not covered by the existing technical regulations and are determined by the jurisdiction such as storage duration and data elements, which pose a challenge for a harmonised legal framework for testing and deployment.

The suitable concept is in development by WP.29 setting out the technical guideline for data recording for all ADS. There is, however, a need for a uniform approach on what data is needed and how long the data shall be stored for.

e) Ensuring safe operation of the ADS

The verification and validation of the ADS is based on safety requirements developed by WP.29, which ensure that the vehicle itself is constructed in a way that the vehicle is in a safe state to be operated on public roads. How safe operation can be ensured was addressed in the Resolution on the Deployment of Highly and Fully Automated Vehicles in Road Traffic and the Resolution on safety considerations for activities other than driving undertaken by drivers when automated driving systems issuing transition demands exercise dynamic control.

WP.29 and existing Resolutions address the safe operation of the ADS, however there might be a need to substantiate existing recommendations by defining broad principles e.g., the need of sobriety when an ADS requires a ready fallback user or with view to traffic rules requiring the presence of a human driver.

f) Terminology

Different approaches being taken at a national level with differing terminology to describe the responsibilities and conditions for delegation of dynamic control can be confusing and it is important that terms are clearly defined and explained.

It is important that new roles and entities are clearly defined and clarified and where possible we should avoid divergence from existing internationally recognised terminology e.g., WP.29 is in its final stages of defining the various user terminology as part of its FRAV workstream.

IV. Difference between Advanced driver assistance systems (ADAS) and Automated Driving Systems (ADS)

At the first GE3 Informal Group, a template was established and one of the sections in this was focused on reviewing the risks arising from the deployment of vehicles with advanced driver assistance systems (ADAS) in road traffic and what lessons can be learnt on the need to regulate vehicles with automated driving systems (ADS).

The discussions within the GE3 Subgroups have often put the spotlight on the confusion in understanding regarding the differences between ADAS and ADS.

Notwithstanding that the technical understanding of these differences are based upon the capabilities of the system, it is acknowledged that a wider understanding from a user perspective between ADAS and ADS may be required.

Below is a representation of the difference between ADAS and ADS outlining the expected capabilities of the human roles mapped against the capabilities of the system.

It should be noted that the various interactions between driver/user and the vehicle's system is dependent on the use case and the below representation only provides an overall understanding of this issue.

Human Roles across ADAS and ADS		SYSTEM CAPABILITIES			
		ADVANCED DRIVER ASSISTANCE SYSTEMS (ADAS)		AUTOMATED DRIVING SYSTEM (ADS) designed to issue a transfer of control within a specified ODD.	AUTOMATED DRIVING SYSTEM (ADS) designed without the requirement of a transfer of control within a specified ODD.
		LONGITUDINAL OR LATERAL CONTROL <i>(Operational only)</i>	LONGITUDINAL AND LATERAL CONTROL <i>(Operational only)</i>	DYNAMIC DRIVING TASK <i>(Operational and Tactical)</i>	
HUMAN ROLES	DRIVER	-Remains responsible for the dynamic driving task at all times, including monitoring the environment. -Can intervene or override the system at any time. -Cannot disengage with the driving task. -Cannot undertake any other activities than driving.	-Is not responsible for DDT when the ADS is performing the DDT/is engaged. -Resumes responsibility for the DDT when the TOC* is successfully completed and/or the ADS is deactivated. <i>*Transfer of control can take place during a journey within the ODD in unplanned circumstances and when</i>	-Is not responsible for DDT within the operational design domain in which the ADS is activated. <i>*System may not be designed to interact with a driver at any stage.</i>	
	FALLBACK USER	Not applicable/Not needed.	-Needs to be attentive to respond to a transfer of control request by the system within a reasonable time frame. -Can engage in activities other than driving. -Fallback user can be remotely located.	-No requirement for a fallback user within operational design domain.	
	REMOTE DRIVER	As an alternative to the driver in the vehicle, remote driver is a driver outside the vehicle. Same responsibilities as the driver above.	Not required at any time for as long as the ADS is performing the dynamic driving task.		
	REMOTE ASSISTANT	Not applicable/Not needed.	No use cases envisaged until now due to the availability of a fallback user and the system's capability to issue a transfer of control request in the event the ADS cannot continue its journey.	-Offers advice or information in the event when the ADS has encountered a situation it cannot manage.	

For detailed information from WP.29 perspective, refer to : ECE/TRANS/WP.29/1140

V. Conclusion

In addition to the discussion laid out above, Industry provides detailed submission sent to GE3 subgroups as an annex to this paper following this section.

Given the broad and extensive area of work covered by WP.1, Industry proposes to take gap assessment of the existing conventions as a phased approach.

At present and building on the work already done by GE3 subgroups, Industry recommends the following focus areas –

1. Conduct a focused section by section analysis of the existing WP.1 Conventions (Vienna 1968 and Geneva 1949) for AVs as well as agree whether existing recommendations contained in the Resolutions (2018 and 2022) are sufficient to be elaborated on and if additional ones are needed.
2. Identify list of responsibilities, beyond the DDT considered important for international harmonization and then work towards attributing who should bear these responsibilities.
3. Identify the current challenges in enabling cross-border operation of AV vehicles via mutual recognition and working to reach an agreement on them, such as reaching a consensus on data/information exchange.
4. Consider the creation of a provision that addresses the existing divergence across national jurisdictions on allowing a human behind the wheel to delegate the dynamic driving task to the ADS.
5. Review mechanisms across jurisdictions to permit automated vehicles whilst streamlining processes to be as efficient as possible.

The outcome from these focus areas can provide further direction on what needs to be addressed in the following phases, as required.

Industry welcomes suggestions from contracting parties on how it can further contribute to the progress of the GE3 objectives.

Annex

The Annex below provides a compilation of the industry submissions to GE3 Subgroups 1 and 2 in response to the questions asked by GE3 following its 6th session in May 2023.

Subgroup 1

1. Are there any conditions for when the driver can delegate the dynamic control to the Automated Driving System (ADS)?

In our view, this question covers vehicles designed with an ADS that is capable of issuing transition demands to a human driver. It may also cover dual-mode vehicles, which are driven by the driver in the ‘manual driving mode’ and by the ADS without any driver supervision in the fully automated driving mode.

The amendment of the Vienna Convention in 2016 and 2022 was a milestone in facilitating the deployment of ADS. The 2022 resolution (on safety considerations for activities other than driving undertaken by drivers when automated driving systems issuing transition demands exercise dynamic control) provides useful recommendations for drivers, manufacturers as well as contracting parties regarding ADS issuing transition demands.

Following amendment of the Vienna Convention, Article 34bis established that compliance with domestic (e.g., EU ADS Implementing Regulation) and international technical regulations (e.g., ECE R157) and domestic legislation governing operation is satisfactory for ADS deployment. Technical Regulations contain robust concepts for transfer of control as they cover individual operational design domain (ODD) and use cases of the ADS function, defining appropriate thresholds for their safe performance.

It is important to recognise that delegation of the dynamic control and activation of the ADS cannot be determined freely but the ADS must first detect a specific set of operating conditions. In other words, the ADS will prevent activation of the ADS by the driver if the vehicle is not within its ODD and/or if the conditions for its activation by the driver are not met:

- For instance, UNECE R 157 contains detailed requirements on the conditions for activating the system by the driver and how dynamic control is transferred from the ADS to the driver considering the various scenarios which could arise.
- The ADS should operate within the boundary conditions of its ODD (or set of ODDs) and therefore the ADS must detect that it is operating within these boundaries and that it is in safe traffic conditions to engage before a human driver can delegate dynamic control to the ADS.
- The provisional and ongoing drafting of the user requirements in FRAV provides recommendations on the interaction processes between the user and the ADS vehicle to obtain a safe use of an ADS vehicle.
- Guidelines for Regulatory Requirements and Verifiable Criteria for ADS Safety Validation from FRAV (Latest version - WP.29-190-08e) also outline requirements for the manufacturer to provide written instructions for the activation and deactivation of the ADS. This work is also ongoing with a mandate to completion by June 2024 and referenced to ensure SG1 considers this whilst progressing its work.
- In a dual-mode vehicle, when the ADS feature is engaged, the human driver is unable to intervene in the dynamic driving task.

The conditions for when the driver can delegate the dynamic control to the ADS can be relatively more complex in urban environments. Any upcoming technical regulations will need to consider this complexity, such as, traffic environment, other road user behaviours and reviewing the responsibilities of certain entities, including that of the driver. SG1 can discuss these potential complexities and accordingly develop guidelines, as required (considering the work being carried out in the ITS WG of WP.29.).

Following the amendment of the Vienna Convention, some countries initiated the adoption of their national road traffic acts, allowing explicitly the delegation of dynamic control to the ADS. For countries where national legislation governing delegation of dynamic control is either not available or is incomplete, the legal risks are a constraint as the expectations from humans involved are not clearly laid out (e.g., driver, remote intervention operator, passenger). In addition, the existence of road traffic rules in countries that explicitly require a human driver behind the wheel to

perform the full dynamic driving task (DDT), naturally prohibit the delegation of dynamic control to an ADS. Until these laws are updated, there is no legal basis to delegate dynamic control to the ADS. This presents a gap across national laws that should be addressed via the new legal instrument.

Different approaches being taken at a national level with differing terminology to describe the responsibilities and conditions for delegation of dynamic control can be confusing and it is important that terms are clearly defined and explained. For example, UK describes a “user-in-charge” as an individual who is in the vehicle and in a position to operate the driving controls while such an ADS feature is engaged. For ADS features that operate without a user-in-charge, UK has introduced the concept of a No-user-in-charge (NUIC). Whereas in Japan, while there is no term equivalent to that of a user-in-charge as in the UK; a new system called “Specified Automated Operation” has been introduced to refer to ADS that do not require the presence of a driver.

WP.29/GRVA has defined the various user terminology as part of its FRAV workstream. FRAV defines the fallback user as a “user designated to perform the DDT pursuant to an ADS fallback response” and an ADS user as “a human being using an ADS where dynamic control of the vehicle is entirely maintained on a sustained basis by the ADS performance of the DDT”. There is a wide consensus across key stakeholders for these terms and as OICA/CLEPA, we would support the use of these terms to continue international dialogue across all forums.

Finally, testing and trialling is less affected since the legal framework often contains exemption procedures that usually allow for sufficient flexibility. Moreover, ADS functions are developed in an iterative process whereby the functions are tested with safety drivers who oversee the ADS.

ADAS

ADAS is covered by existing regulations, advertising regulation, market surveillance and roadworthiness tests. When activating ADAS, the driver has full responsibility of the driving task and is only supported by the system.

The vehicle manufacturer prescribes instructions for use and strategies need to be implemented to ensure mode awareness as well as to ensure the driver remains engaged with the driving tasks.

Application of existing WP.1 framework

Below is a high-level analysis of the application of and gaps in existing WP.1 Framework. A more thorough analysis can uncover more details and we would welcome an extended and coordinated time frame to focus on the specific application and gaps in the existing WP.1 Legal framework, specifically for the 1949 and 1968 Conventions on Road Traffic.

- Global Forum for Road Traffic Safety (WP.1) Resolution on the Deployment of Highly and Fully Automated Vehicles in Road Traffic adopted in September 2018:
 - Stipulates that ADS should only operate within their ODD 4(e).
 - Stipulates that ADS should endeavor to safely tolerate errors of the vehicles’ users, inside and outside of the vehicle, and of other road users in order to minimize potential effects of such errors. 4(c).
 - Provides specific recommendations for the ADS user reproduced below, all of which are relevant for the specific issue/risk being addressed :
 5. Users of automated driving systems in highly and fully automated vehicles should:
 - (a) Be aware and informed of their proper use prior to starting the journey;
 - (b) Meet the requirements for their safe use and follow the procedures for their use;
 - (c) Be able to communicate with the vehicle;
 - (d) Understand if, and when, it is necessary to exercise dynamic control to complete a journey. If the user is required to exercise dynamic control, or chooses to do so, they must:
 - (i) Hold the necessary driving permits; and
 - (ii) Comply with traffic rules.
 - (e) Act lawfully at all times so as not to compromise road safety regardless of whether they or automated driving systems are exercising the dynamic control.

○ Asks that the governments consider incorporating the recommendations in this Resolution into their domestic legal and policy frameworks for road traffic in a way that recognizes their national context, working with civil society and industry 6(d).

● Global Forum for Road Traffic Safety (WP.1) resolution on safety considerations for activities other than driving undertaken by drivers when automated driving systems issuing transition demands exercise dynamic control adopted in November 2022 addresses specifically the various considerations for ADS issuing transition demands, for users, manufacturers and contracting parties on the transition demand concept which is the transfer of control from the system to the ADS. Specifically relevant for the issue in question are the recommendations for drivers reproduced below:

4. Drivers should:

- a) Prior to any road use, familiarize themselves with how to operate the vehicle and the requirements regarding activities other than driving;
- b) Maintain physical and mental ability to safely take over dynamic control of the vehicle;
- c) Respond to a transition demand by taking over dynamic control in an appropriate and timely manner;
- d) Refrain from performing activities other than driving if those activities impede the take-over of dynamic control when a transition demand is issued;
- e) Refrain from interfering with automated driving systems in a way that could compromise the safe functioning of the systems and road safety in general.

- Art. 1(ab), 1(ac), 8 Para. 5bis, 34bis, 39 Vienna Convention
- Art. 3 (5 bis) Vienna Convention: road safety education

Gaps in existing WP.1 framework

● As described in our assessment, a summary of key gaps below:

- Potential complexities with transfer of control in urban ODDs.
- Inconsistencies across national regimes
- Existing gaps arising from unavailable regimes needed for ADS deployment, incomplete regimes, and prohibitions under existing law. This essentially focuses on further elaborating and providing guidance on (b) domestic legislation governing operation as per Article 34bis following amendment of Vienna Convention.
- Inconsistent terminologies for progressing dialogues across international fora.

● As shared above, we welcome an extended time frame to do a more thorough analysis especially with regards to the existing Conventions.

Proposed approach.

As next steps, the industry would welcome the following :

- Comparison of the various established national frameworks in outlining conditions for the delegation of dynamic control by the driver. In addition, the comparison can also include framework to ensure driver's awareness of the boundary conditions for the activation of ADS. For example, Germany has the following relevant documents in its framework –
 - § 1b StVG: rights and obligations of a driver using a highly or fully automated functions
 - § 1e StVG : procedural and technical requirements for the operation of motor vehicles with autonomous driving functions in determined operational areas (focus people mover)
- A further deep dive into the existing conventions to agree on the gaps.
- Development of a position on the best way to close any gaps and achieve harmonization (including additional complexities with urban environments not otherwise envisaged for motorway scenarios).
- Alignment with the differences in automation levels to avoid the risk of setting the same requirements for fundamentally different systems by establishing clear lines of separation between ADS, ALKS, and DCAS systems in terms of deployment.

Other resources particularly covering the issue/risk above:

- Japan's Road Traffic Act and the Road Transport Vehicle Act

- UK – The Automated Vehicle Driver Responsibility in Vehicle Education Group – Self-Driving Communications Toolkit
- Varying taxonomy in SAEJ3016, ISO/SAE PAS 22736:2021 and ECE/TRANS/WP.29/1140CE/
- Technical regulations on the transfer of dynamic control (e.g. UNECE R157, Dir. (EU) 2022/1426, UNECE FRAV guidelines)
- ISO 34503 Specification for operational design domain (Test Scenarios for ADS)
- 2016 U.S. Federal AV Policy (clarity on applicability of federal guidance criteria to each SAE/ISO level of automation)
- California state ADS regulations (“drivered” vs. “driverless” operating requirements)
- France Article 31 (distinctions between “partially automated vehicle,” “highly automated vehicle,” and “totally automated vehicle”)
- UK Law Commission (distinction between “user-in-charge” and “no user-in-charge” ADS)
- Germany
 - § 1b StVG: rights and obligations of a driver using a highly or fully automated functions
 - § 1e StVG : procedural and technical requirements for the operation of motor vehicles with autonomous driving functions in determined operational areas (focus people mover)

2. If some or all of the responsibilities normally attributed to the driver are not borne by the driver anymore, then who should bear these responsibilities as the ADS does not have legal personhood? How do we identify possible new entities which bear responsibilities normally attributed to the driver?

The decision of who takes responsibility when the ADS is engaged is an important consideration for new deployment regimes to enable the safe and legal deployment of an ADS on public roads. When the ADS is engaged, not all the responsibilities that are traditionally assigned to the driver will apply and there is a need to consider what new entities and responsible parties need to be recognised on a legal basis, to draw clear lines of responsibility and liability. This is particularly crucial for public trust and confidence in the technology.

Driver responsibilities can be broadly divided into two key categories – Those associated with the dynamic driving task (DDT) and those beyond it. The key responsibilities related to the DDT performance, including compliance to traffic rules are transferred to the ADS and form a part of the work programme of WP.29/GRVA.

The responsibilities of a conventional driver related to undertaking liability with regards to the DDT operation should be attributed to an organisation who puts their system or vehicle forward for approval or takes responsibility for the automated vehicle’s safe operation. Where no pre-deployment approval is exercised in the jurisdiction, the organisation that has conducted any necessary self-certification prior to placing the vehicle on the road should bear responsibility. This organisation should be able to make a robust argument for the safety of how the vehicle drives itself.

We would also refer SG1 to the Industry position submitted at GE3 in May 2022 particularly Section II on challenges related to traffic laws and Section III on Administrative and procedural aspects about ADS operation.

Attributing responsibilities beyond the DDT would depend on several factors such as:

- The registered owner of the vehicle (can be an individual for privately owned or by an organisation for MaaS)
- Existence of contractual agreements between different roles such as manufacturer and operator.
- Model of ownership – long term lease owner, vehicle “possessed” on a subscription basis, vehicle on rent etc.

The attribution of responsibilities to specific entities can be dependent on the use case considering the ADS feature(s) such as, in the context of privately owned vehicles or commercial fleets. These could include the registered user, remote operator, fleet operators and OEM/ manufacturer, infrastructure provider etc.

It may be useful to first draw out a common list of responsibilities, beyond the DDT, considered important for international harmonization and then attribute who should bear these responsibilities. For example, driver duties to ensure traffic safety at the site of the accident such as placing a warning triangle, claiming insurance, roadworthiness, maintenance etc.

The responsibilities are subject to the national legal framework:

- Different responsibility concepts in different countries should be avoided as a clear understanding of the responsibilities involved in ADS deployment is not only important for industry but builds foundations for social readiness for the use of ADS technologies.
- For example, in Japan, the primary obligation for liability of the operation of an ADS fitted vehicle lies with the operating provider. In UK, the proposals endorsed by the government make a distinction between the No-user-in-charge operator, an organisation that has operational oversight of the AV and the Authorised Self-Driving Entity (ASDE) who bears responsibility for the AVs, although both roles can be fulfilled by the manufacturer. The UK proposal for a user-in-charge is that of the human in the driving seat while a self-driving feature is engaged. Their main role is to take over driving, either following a transition demand or because of conscious choice. In Germany, in the case of an ADS which is designed to engage with a fallback user, the driver must remain sufficiently alert to resume control of the vehicle in case of a transition demand or when s/he realises that conditions for using the ADS are no longer met. The responsibilities are divided between keeper/driver and the OEM. This is different in the case of an ADS which is designed to operate without a fallback user, where the responsibilities are divided between the keeper/technical oversight and the OEM.
- It is important that new roles and entities are clearly defined and clarified and where possible we should avoid divergence from existing internationally recognised terminology, for instance the distinction between fallback and user-in-charge in national regimes.

The responsibility concepts should not only deal with the assignment of responsibilities but also analyse how those obligations in the present road traffic rules, which focus on human behaviour, can be fulfilled without a human present on the site (e.g., warning triangle). When defining additional roles and duties, competency requirements and availability of resources should be considered.

Additional responsibilities for regulators need to be addressed for effective ADS deployment across national jurisdictions. Any gaps in this area may not only impede ADS deployment but also place unnecessary burdens on industry.

ADAS

The driver continues to be a driver and comply with all traffic rules including performing the monitoring of the traffic environment. This is different from when an ADS is engaged, where the user is not responsible for the DDT, including monitoring of the traffic environment.

ADAS deployment responsibilities are, subject to national law, normally divided as follows:

- Liability of the OEM for the proper design/production/instruction/marketing of the ADAS function.
- Driver for the proper performance of the driving task including the other behavioural duties according to the traffic rules using the ADAS function as support feature.
- The person under whose name the car is registered stays responsible for the residual risks covered by compulsory insurance.

This liability concept has proved in the past to be flexible enough to find adequate solutions for all situations arising from the use of ADAS functions.

Application of existing WP.1 framework

Below is a high-level analysis of the application of and gaps in existing WP.1 Framework. A more thorough analysis can uncover more details and we welcome an extended and coordinated time frame to focus on the specific application and gaps in the existing WP.1 Legal framework, specifically for the 1949 and 1968 Conventions on Road Traffic.

- Art. 7 Geneva Convention: no endangering or obstruction of traffic
- Art. 13 Geneva Convention: drivers shall not leave vehicles without necessary precautions to avoid an accident.
- Art. 14 Geneva Convention: load of vehicle shall not cause danger or damage.
- Art. 18- 21 Geneva Convention: Registration of vehicles.
- Art. 22 Geneva Convention: vehicles shall be in good working conditions and in safe mechanical conditions.
- Art. 25 Geneva Convention: Contracting States make information available to establish identity of the persons holding driving licenses and of owners/ persons in which name the vehicle was registered.

- Art. 3 Para. 6 Vienna Convention: Contracting States exchange information necessary to ascertain the identity of the person in which name the vehicle was registered if the vehicle is involved in accident or if the driver is liable/disqualified for serious infringement of road traffic rules.
- Art. 3. Para. 7 Vienna Convention: facilitation of international traffic by simplifying formalities, competence and opening hours of the customs.
- Art. 3 Para. 8 Vienna Convention: Insurance is subject to national law.
- Annex 4 of the Vienna Convention: Chassis contains necessary information with regard to the maker of the trademark (e.g., name, production, serial number).
- Art. 7 Vienna Convention: General rules contain duties outside DDT (e.g. no obstruction of traffic, no endangering of property, wearing of seatbelts).
- Art. 30 Vienna Convention on loading of vehicles.
- Art. 30bis Vienna Convention on carriage of passengers in such a way that it does not interfere with driving.
- Art. 31 Vienna Convention: Behavior in case of accident (e.g. safety of traffic site; information duties).
- Art. 35 Vienna Convention: Registration of vehicles.
- Global Forum for Road Traffic Safety (WP.1) Resolution on the Deployment of Highly and Fully Automated Vehicles in Road Traffic adopted in September 2018.
- Global Forum for Road Traffic (WP.1) Resolution on safety considerations for activities other than driving undertaken by drivers when automated driving systems issuing transition demands exercise dynamic control.

Gaps in existing WP.1 framework

- Summary of gaps highlighted in our response:
 - o Differing responsibility concepts across national laws and/or proposals.
 - o Fulfilment of current obligations in the present road traffic rules, which focus on human behaviour, without a human presence (e.g., warning triangle).
- Summary from the Industry position submitted at GE3 session of May 2022
 - o Flexibility in enforcement of traffic rules when applied to an ADS, when ambiguous or conflicting traffic laws may create issues in legal interpretation.
- Guidelines on attributing responsibility to an “organisation” instead of an individual for performing the dynamic driving task. Some countries continue to rely on an individual (such as the remote operator) when it comes to settling liability. This can create additional challenges when the ADS performs the entire dynamic driving task.
- Guidance on government structures set up for approval with a view to streamline and avoid the development of too many authorities within one jurisdiction.
- Consider streamlining key roles of the government such as related to infrastructure.
- Guidelines for avoiding any confusion in driver understanding of ADAS vs ADS.

Proposed approach.

- Specific to the DDT, discuss the possibilities for convergence of international traffic rules to align on consistent ADS behaviour internationally as well as collaborate on the work ongoing in FRAV on compliance to rules of the road.
- Draw out a common list of responsibilities (beyond the DDT) considered important for international harmonization and then attribute who should bear these responsibilities.
- Comparison of the various established national frameworks outlining responsibilities and agreeing harmonisation wherever possible.
- Discuss and agree on the consolidation of the gaps in the existing WP.1 framework followed by a workplan to resolve these.

Other resources particularly covering the issue/risk above :

- Automobile Liability Security Act in Japan, it is organized that the primary obligation lies with the operating provider.
- Road Traffic Act in Japan (2023 revision) Specific automated operation designates a specific automated operation operator as the person responsible for the operation of the vehicle and gives him or her a duty to do so.
- Automated and Electric Vehicles Act 2018 Part 1 in the UK sets out who is liable for the damage caused by an accident by AV.
- UK proposes a clear means of assigning responsibility for vehicle behaviour in their ‘Connected and Automated Mobility 2025: Realising the benefits of self-driving vehicles in the UK’ paper published in August 2022. This endorsed the recommendations of the four year-long consultation by the Law Commission of England & Wales and Scottish Law Commission.

- Germany - 1a Para. 3 StVG: During the use of a highly or fully automated vehicle the person activating the function stays with the driver. 1f Para. 1 StVG: Keeper of vehicle stays responsible for all behavioural duties outside the driving task, maintenance of the ADS and the technical oversight.

Subgroup 2

1. How can it be determined who has or had responsibility for the dynamic control of the automated vehicle at any given time?

The question on who has or had responsibility for the dynamic control is subject to risk/issue 2 of subgroup 1 according to our understanding.¹ This first risk/issue of subgroup 2 seems to focus on how it can be verified whether the ADS or the driver was exercising the dynamic control at any given time².

The determination of responsibility can play a role for the following aspects:

- Deriving occurrence data for the in-service monitoring and reporting and
- Informing the discussion on liability.

The in-service monitoring and reporting (ISMR) is one of the workstreams being discussed under the Informal Working Groups (IWG) on FRAV and VMAD.

For the liability discussion, it is important to note that the question on who had responsibility for the dynamic control does not necessarily establish liability. To decide on the overall responsibility of a traffic accident, further information is needed, e.g., on the surrounding environment (for instance information on the movements of other road users). Nevertheless, the determination of who was in control at any given time is an important contributing factor in accident investigations and for settling insurance claims. For this reason, determination should be within the framework where consumer consent is accounted for.

Within the technical requirements and guidelines, data recording is considered a suitable concept to determine who was in control of the dynamic driving task at any given time. For instance, the existing UNECE R157 on a particular ADS in form of Automated Lane Keeping Systems (ALKS) already contains requirements for a Data Storage System for Automated Driving (DSSAD), which “enables the determination of interactions between the ALKS and the human driver”³: The records/timestamps from the DSSAD can be used to determine who is in charge of DDT at a certain time.⁴ A guideline to cover DSSAD requirements for all ADS is currently discussed in the SG-DSSAD of IWG EDR/DSSAD under GRVA and shall be available until July 2024.

There are aspects of data recording not covered by the existing technical regulations such as storage duration. Also, the data elements/content besides what already is required internationally, can become a part of an additional compliance measure at a national level. These additions vary across national jurisdictions and pose a challenge for a harmonized legal framework for testing and deployment.

This challenge could be illustrated with many examples. Only for the sake of simplicity, we refer to one particular difference in the occurrence requirements set out in Dir. (EU) 2022/1426 and the German Road Traffic Act. For the deployment of a robot shuttle in Europe, the DSSAD would *inter alia* need to record certain data elements when the vehicle was involved in a detected collision.⁵ If the same robot shuttle should also operate in German market, however, this data would not be sufficient as per the local requirements. In addition to the detected collisions, only during its operation in Germany, the vehicle would need to record data not only when an accident occurred but also on the occurrence of “almost-accidents” and “conflict scenarios” in general.⁶ What adds to the difficulty in this example is

¹ For potential input please refer to the relevant submission in subgroup 1.

² For input on the further aspects (i.e. 1. What do we need to take into account when the driver task will be given from a human to the ADS system?; 2. In what scenario’s has an ADS system control?; 3. What is needed to ensure a smooth transition of control, including HMI?) please refer to submission on risk/issue 2 of subgroup 1.

³ Art. 2.15. UNECE R 157.

⁴ Artt. 8.2 and 8.3 UNECE R 157.

⁵ Art. 9.1.7 Dir. (EU) 2022/1426.

⁶ § 1g Para. 2 No. 2 German Road Traffic Act.

that German Road Traffic Act does not contain a definition for “conflict scenarios”, which makes the implementation of this regulatory requirement even more complex.

Additional issues with regard to ADS data are raised by the question on the duration for which the recorded data elements must be stored (e.g., in Germany, data collected in a highly automated vehicle with a fallback user must not be stored longer than 6 months⁷ whereas the U.K. proposes the time frame to be 39 months). Especially, the latter can cause problems whenever an ADS shall be used across national borders in addition to the burden on manufacturers to meet differing demands on data storage in different countries.

Alignment between national laws and regulatory requirements is needed to reduce the burden on the industry. In addition, a harmonized, clear guidance on data recording is necessary to make sure that requirements are proportionate to their purpose, e.g., ensuring safety and supporting liability while protecting personally and commercially sensitive data. Thus, clarity is needed for what purpose the data are required by authorities (e.g., facilitating the law enforcement in case of accidents, field monitoring, deriving KPIs for safety assessment).

ADAS

The driver when using ADAS function stays responsible for the dynamic control. Thus, ADAS is not in scope of DSSAD. Consequently, a comparison with ADAS does not seem to be useful.

Application of existing WP.1 framework

Below is a high-level analysis of the application of and gaps in existing WP.1 Framework. A more thorough analysis can uncover more details and we welcome an extended and coordinated time frame to focus on the specific application and gaps in the existing WP.1 Legal framework, specifically for the 1949 and 1968 Conventions on Road Traffic.

- Global Forum for Road Trac Safety (WP.1) Resolution on the Deployment of Highly and Fully Automated Vehicles in Road Traffic adopted in September 2018 contains the recommendation that ADS shall “*operate in a way that enables verification as to whether or not they are or were performing dynamic control*”⁸.

Gaps in existing WP.1 framework

Industry sees the need for a uniform approach on what data is needed and how long the data shall be stored for to make sure that these requirements are proportionate to their purpose of determining who was in control of the dynamic driving task.

Proposed approach

A first step on this towards a uniform approach is analysis, discussion, and common understanding for which purpose the data shall be used for, e.g., for

- facilitating the law enforcement in case of accidents,
- field monitoring,
- deriving KPIs for safety assessment.

This first step should be followed up by an analysis of what data elements in context of what occurrences are needed and how long those data elements shall be stored.

The discussions on this topic would overlap with existing workstreams ongoing in the IWG on DSSAD/EDR, FRAV and ITS and therefore, we recommend collaboration on this topic between the WP.29/GRVA IWGs and WP.1 GE.3 experts.

Other resources particularly covering the issue/risk above:

⁷ § 63a Para. 4 German Road Traffic Act. For sake of completeness, it shall be pointed out that the 6-month period does not apply when the vehicle was involved in a traffic accident. Following an accident, the data shall be stored for 36 months.

⁸ Chapter IV.4.(j)

- Technical regulations on data recording in UNECE R 157
- SG-DSSAD of IWG EDR/DSSAD under GRVA is working on DSSAD requirements for all ADS until July 2024
- UNECE WP.29 - VMAD SG3: ISMR template in development and to feature in FRAV/VMAD integration.
- Dir. (EU) 2022/1426 including guidance in development for the Interpretation document.
- Article 31/Decree on Automated Driving in France
- § 63a StVG (In-Vehicle data processing for highly and fully automated driving functions) and § 1g StVG (Data processing for motor vehicles with autonomous driving functions in determined operational areas) as well as Ordinance on Automated Driving in Germany
- Road Transport Vehicle Act in Japan
- Automated and Electric Vehicle Act 2018 in UK
- 2016 U.S. Federal AV Policy
- California state ADS regulations

2. What are the roles and who has the responsibilities of the driver when the ADS is engaged, if there is a driver in the vehicle? What are the roles and who has the responsibilities of the driver for vehicles that do not require a driver in the vehicle? How can the safe operation of these vehicles be ensured?

A clear understanding of roles and responsibilities when using an ADS is important for building trust and social acceptance of the new technology.

There is a broad distinction between two categories of driver responsibilities:

- The duties to perform the DDT and
- the duties outside the DDT (maintenance of the vehicle, roadworthiness, seat belt obligation, load securing, securing accident site by placing a warning triangle, etc.)

When using an ADS those duties, which rest in conventional vehicles with the driver, need partly to be re-assessed. This also might require changes to the existing legal framework to ensure a safe and legal deployment of an ADS on public roads.

Industry's experience with testing and deployment in the existing work and the assessment of potential gaps with regard to the driver responsibilities was already subject to question 2 of Sub-group 1⁹. The scope of the question 2 of sub-group 1 also included the identification of new entities, which goes beyond the scope of this question. In contrast, it did not address the differentiation between vehicles, which require the presence of a driver, and vehicles, which do not require the presence of a driver.

We understand that the difference between the 2 sub-questions is whether vehicles fitted with an ADS are designed to have a driver or not. Since this difference was also addressed in the submission of OICA/CLEPA on question 2 of sub-group 1, we refer sub-group 2 to this previous sub-mission, highlighting here the following aspects in the assessment:

- During the time in which the ADS is engaged, the driver does not have any role in the performance of the DDT, which is in the responsibility of the ADS. If the ADS requires a fallback ready user, then the driver needs to stay in a position to respond to a transition demand from the system. The driver must be fully aware and have an understanding of the manufacturers' instructions associated with ADS engagement prior to accepting the ADS to be engaged and of the takeover process during engagement.¹⁰ If ADS does not require a fallback ready

⁹ Question 2 of Sub-Group 1 concerned the following risk/issue: "If some or all of the responsibilities normally attributed to the driver are not borne by the driver anymore, then who should bear these responsibilities as the ADS does not have legal personhood? How do we identify possible new entities which bear responsibilities normally attributed to the driver?"

¹⁰ Art. IV.4.(a) of Global Forum for Road Traffic Safety (WP.1) resolution on safety considerations for activities other than driving undertaken by drivers when automated driving systems issuing transition demands exercise dynamic control and Art. V.5 (2) Global Forum for Road Trac Safety (WP.1) Resolution on the Deployment of Highly and Fully Automated Vehicles in Road Traffic.

user, all occupants are passengers.

- For automated vehicles there are a range of responsibilities associated with the non-dynamic driving task which can be distributed across various entities depending on the ownership model. For example, in case of private ownership (not on lease), the registered vehicle keeper is responsible for activities such as insurance, maintenance of the vehicle, service etc. The same responsibilities can be assigned to the fleet owner in case of fleet ownership. Even then, certain other responsibilities, for example, ensuring timely software updates are available for the ADS and have been completed, may be a joint responsibility between the vehicle manufacturer and registered keeper. In the case of such responsibilities, domestic legislation accounting for specific use cases in their jurisdictions can suffice. This is aligned with Art. 34 bis of the Vienna Convention. However, a similar provision does not seem to exist in the Geneva Convention. Nevertheless, a harmonized approach in international and domestic legislation including the use of same terminology would contribute in achieving the best case for deployment of automated vehicles.

II. ASSESSMENT OF SUB-QUESTION 3

Ensuring the safe operation of a vehicle itself is strictly in the remit of WP.29. The verification and validation of the ADS in relation to certification is based on safety requirements developed by WP.29, which ensure that the vehicle itself is construed in a way that the vehicle is in a safe state to be operated on public roads. WP. 29 also considers other aspects, like ensuring continued safety performance of the ADS through its lifetime or setting requirements for in-use monitoring and reporting.

Therefore the work of GE.3 within WP.1 should be confined to the aspects of road safety or road traffic issues. In this regard, the following aspects could need considerations:

The first aspect would be the question how ADS users experience safety when the ADS is driving itself. Users must refrain from tampering with ADS operation when the system is engaged and instead seek assistance from on-board or off-board personnel. Moreover, the user needs to have an awareness of how the ADS works before embarking on a journey, following vehicle manufacturer/ ADS manufacturer/ operator instructions etc. On the manufacturer side, answers could cover what the manufacturer needs to do and/or is doing to build trust that can be carried over as an expectation in a new legal instrument.

Another aspect includes considerations how to improve safe interaction of the ADS vehicle with the other road users.¹¹ Safe interaction with the other road users requires the ADS behaviour to be predictable and comprehensible to other road users. Thus, there is a need for adjustment of those rules which require the presence of a human (e.g. behaviour after an accident).

ADAS

When using an ADAS system the driver continues to be a driver and comply with all traffic rules including performing the monitoring of the traffic environment. Thus, with regard to the question of safe operation the comparison between ADS and ADAS is not in the scope of this question.

Application of existing WP.1 framework

Below is a high-level analysis of the application of and gaps in existing WP.1 Framework. A more thorough analysis can uncover more details and we welcome an extended and coordinated time frame to focus on the specific application and gaps in the existing WP.1 Legal framework, specifically for the 1949 and 1968 Conventions on Road Traffic.

With regard to the safe deployment of ADS vehicles the following Articles of the 1949 Geneva Convention might be of interest:

- Article 8: Need and number of drivers
- Article 13 Para. 2: no danger/obstruction by stationary vehicle
- Article 14: Loading of vehicle

¹¹ For instance, the latest draft version of FRAV guideline include recommendation for safe interaction between user and ADS: <https://unece.org/sites/default/files/2023-09/GRVA-17-33e.pdf>.

- Article 22: Good working condition of the vehicle
- Annex 8: Conditions to be fulfilled by the drivers of motor vehicles in international traffic

With regard to the safe deployment of ADS vehicles the following Articles of the 1968 Vienna Convention might be of interest:

- Article 3 Para. 8: Admission of drivers/occupants on the territory
- Article 6: Instructions given by authorized officials
- Article 8: Driver
- Article 23 Para. 4: Prevention of accidents
- Article 30: Loading of vehicles
- Article 31: Behaviour in case of accidents
- Article 34bis

The question what is needed for a safe deployment of the ADS by the users with regard to traffic safety and road traffic rules is covered on a generic level by the 2 resolutions of WP.1:

- Global Forum for Road Traffic Safety (WP.1) Resolution on the Deployment of Highly and Fully Automated Vehicles in Road Traffic contains the following recommendation for the users in Chapter V.5.:
 - (a) Be aware and informed of their proper use prior to starting the journey;
 - (b) Meet the requirements for their safe use and follow the procedures for their use; (c) Be able to communicate with the vehicle;
 - (d) Understand if, and when, it is necessary to exercise dynamic control to complete a journey. If the user is required to exercise dynamic control, or chooses to do so, they must:
 - (i) Hold the necessary driving permits; and
 - (ii) Comply with traffic rules.
 - (e) Act lawfully at all times so as not to compromise road safety regardless of whether they or automated driving systems are exercising the dynamic control.
- Global Forum for Road Traffic (WP.1) Resolution on safety considerations for activities other than driving undertaken by drivers when automated driving systems issuing transition demands exercise dynamic control contain the following recommendations for the drivers in Chapter IV.4:
 - a) Prior to any road use, familiarize themselves with how to operate the vehicle and the requirements regarding activities other than driving;
 - b) Maintain physical and mental ability to safely take over dynamic control of the vehicle;
 - c) Respond to a transition demand by taking over dynamic control in an appropriate and timely manner;
 - d) Refrain from performing activities other than driving if those activities impede the take-over of dynamic control when a transition demand is issued;
 - e) Refrain from interfering with automated driving systems in a way that could compromise the safe functioning of the systems and road safety in general

Gaps in existing WP.1 framework

The recommendations contained in the 2 resolutions seem sensible and still valid from industry's point of view. However, one should analyse how the recommendations can be implemented by the contracting parties in a harmonized way by defining broad principles, e.g. the need of sobriety in those use case of an ADS requiring a ready fallback user. Another example would be an analysis how the recommendation for the ADS to interact safely with the other road users can be operationalized in light of those traffic rules requiring the presence of a human driver.

Proposed approach

- Decide on recommendation contained in the Resolutions are sufficient or addition is needed
- Decide on whether the recommendations should be complemented by some general principles (e.g. need of fall back user to stay sober, response in case of accident; adjustment of the road traffic rules requiring the presence of a human driver)
- Discuss and agree on the consolidation of the gaps in the existing WP.1 framework followed by a workplan to

resolve these.

Other resources particularly covering the issue/risk above

- UK: Law Commission Consultation on AVs.
- UK: Toolkit from the automated vehicle driver responsibility in vehicle education group (AV-DRIVE)
- Japan: National Police Agency run “Research committee to examine the expanding ADS“ including extracting Road Traffic Act issues about ADS Lv4 for personal use and consideration of the need for system development.
- Japan: Amendment of the Road Traffic Act in 2019 and 2022
- Arizona: <https://www.azleg.gov/legtext/55leg/1R/laws/0117.pdf>
- California: <https://www.dmv.ca.gov/portal/file/adopted-regulatory-text-pdf/>