Conférence Européenne des Directeurs des Routes

Conference of European Directors of Roads

Trusted Integrity and Authenticity for Road Applications (TIARA)

Interim report: National Road Authority guidance on legal and ethical use of data

Draft Interim report

This is the first interim part of a deliverable that will be updated with new results by the end of the project. Please share your comments to ilkka.kotilainen@traficon.fi

Deliverable 6 Version 0.2

30 May 2024

CEDR Call 2022 Data: Integrity, Authenticity and Non-Repudiation integrated in Trust Models for C-ITS applications

Trusted Integrity and Authenticity for Road Applications (TIARA)

Deliverable 6: NRA guidance on legal and ethical use of data

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Executive summary

The objective of TIARA project's Work Package 3 (WP3) Legal and Ethical Aspects was to review the legal and ethical ramifications for NRAs when making use of C-ITS data, and of how these change the role of the NRA.

The main objective of the first work phase for June 2024 Interim report was responsibility of the road authority to ensure that data is accurate, and the accountability when inaccurate data is sent.

The use methods were literature review, interviews, workshops, and collaboration with the other TIARA project's work packages of security (WP2) and privacy (WP4), as well as CEDR Project Executive Board (PEB) and CEDR Data Call 2022 DROIDS and PRESORT projects collaboration in the workshop.

The main results of the first Interim work phase included first results and hypotheses of the European ITS and C-ITS legal framework as well as interview and workshop feedback of the research framework five elements of European legal framework, Member States national legislation and policies, Member States and authorities' contractual agreements and incentives, case studies and legal case decisions and authorities and industry views on data use and responsibilities.

European legislative framework for Intelligent Transport Systems (ITS) is set by the ITS Directive (2023/2661) and its delegated act. Delegated act for C-ITS does not exist, although draft has been published in 2019. European legislation has no direct technical requirements outside of required data formats (DATEX II, etc.) related to C-ITS or ITS data accuracy nor quality in European legislation. However, Member States have several responsibilities such as to establish national access points and do collaboration with other Member States. When a road operator deploys C-ITS services in Europe it follows applicable standards and common European harmonised C-Roads specifications, which include or may include in the future minimum requirements for the data accuracy/quality, to achieve cross-border interoperability.

Next the study will review further feedback received from the workshop, such as interview contacts and study ethical guidelines and responsibilities of data accuracy and communication of data to users.

TIARA project description

The objective of the TIARA project (*Trusted Integrity and Authenticity for Road Applications*) is to provide the National Road Authorities (NRAs) with an increased understanding of what is required to achieve a trustworthy and secure data infrastructure. The availability of data has allowed road users and NRAs to benefit from new business models. To deliver these benefits, the data infrastructure must be trustworthy and trusted, i.e., secure, with assurances that it is managed to achieve privacy for all stakeholders.

As more C-ITS services develop in Europe, and road users access and share more C-ITS data through open border countries, NRAs will need to ensure greater interoperability through common approaches to connected systems. Data trust is therefore paramount.

CEDR is undertaking a series of projects to research how NRAs can maintain and share the digital road infrastructure data and improve the use of third-party data by NRAs.

Since the C-Roads Platform has started, several ITS programmes have been rolled out and it has been identified that there are key elements that the NRAs will need to understand before implementing these systems more widely. The TIARA project has been designed to address the two key areas of Trust and Privacy in C-ITS applications. The first subject Trust concerns an understanding of the implementation of trust models that could protect C-ITS data. The second subject Privacy concerns an understanding of the impact of processed user personal data, including location.

Three broad research areas that have been identified:

- Trust for C-ITS applications to develop practical guidance for the implementation of PKI infrastructure for C-Roads,
- Legal and ethical ramifications for NRAs when making use of C-ITS data, and of how these change the role of the NRAs,
- Privacy impact of the processed road user location data, and recommendations to improve the location privacy-preservation for NRAs.

An experienced team of European research organisation have gathered under the coordination of AESIN/Techworkshub, the UK-based member trade association. To address this complex topic, we recognise that the best approach will be through network engagement with many organisations and individuals with experience and technical expertise, preferably independent of any specific solution vendors.

AESIN/Techworkshub belongs to the Techworkshub organisation, through which it has access to member experts in both transport and Internet-of-Things (IoT) security sectors.

SINTEF, as an independent and non-profit research organisation, has independent technical expertise and deep experience from PKI deployments in multiple sectors.

Traficon has longstanding experience of independent work with NRAs, specifically legal and ethical expertise of particular relevance to this project.

TML, bridging the gap between university and private sector, is an independent open and transparent organisation with extensive experience of data analyses and privacy ramifications.

Linking the three broad research areas identified to expertise of these organisations provides a natural project delivery structure, which will benefit CEDR and all the stakeholders involved.

A key TIARA objective is to deliver the project in close liaison with CEDR and its members, as well as the two research projects funded in the CEDR 2022 Research call on Data, Topics A (DROIDS) and B (PRESORT). The liaison ensures that results are fully compliant with CEDR

and Programme Executive Board (PEB) expectations. The liaison also guarantees that the DROIDS and PRESORT projects have the possibility to utilise TIARA results and vice versa.

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Glossary

ADS	Automated Driving System
C-ITS	Cooperative Intelligent Transport Systems
C-Roads	C-Roads Platform is a joint initiative of European Member States and road operators for testing and implementing interoperable C-ITS services for European road users.
EU	European Union
NAPCORE	The National Access Point Coordination Organisation for Europe
ISO	International Organization for Standardization
ITS	Intelligent Transport Systems
ITS Directive	Directive of Intelligent Transport Systems, (EU) 2023/2661 Directive
RTTI	Real-time traffic information, (EU) 2022/670 delegated act
SRTI	Safety Related Traffic Information, (EU) 886/2013 delegated act

1 Introduction

The European National Road Authorities (NRA) responsibilities include planning, development and maintenance of physical infrastructure with related coordination of land use as well as traffic control and management. In the era of digitalisation, one important NRA responsibility related to previous ones is collecting, managing and sharing data. Improvements in traffic safety, efficiency and sustainability are expected with real-time and traffic safety related data which is also exchanged by Cooperative Intelligent Transport Systems (C-ITS). C-ITS are managed by different public and private stakeholders that provide services for the end users on the road network. To gain the previous benefits, the NRAs have been deploying C-ITS infrastructure in collaboration with the industry. In addition to C-ITS requirements of secure data infrastructure and trusted messages, legal and ethical ramifications for NRAs when making use of C-ITS data and the role the NRA in the C-ITS ecosystem need to be understood to provide safe, trusted and sustainable services for the road users.

The primary goal of the TIARA (Trusted Integrity and Authenticity for Road Applications) project is to assist National Road Authorities in understanding the implementation of trust models that could be used for the protection of Cooperative Intelligent Transport Systems (C-IT8rS) data, leading to guidance to help NRA's implement a consistent and transparent and interoperable security specification across Europe.

The objective of TIARA project's Work Package 3 (WP3) Legal and Ethical Aspects was to review the legal and ethical ramifications for NRAs when making use of C-ITS data, and of how these change the role of the NRA. The expected outputs are as follows:

1. Guidance on the responsibility of the road authority to ensure that data is accurate, and the accountability when inaccurate data is sent.
2. Guidance on best practice for the communication of data and its limitations with road users.
3. Views on how to be open and transparent with roads users on the use of data
4. Review of how communications around the use of C-ITS systems and data can be ensured to be inclusive of road users across technical ability. Guidance on developing C-ITS services that are inclusive of road users across technical abilities.
5. Lessons from other industries on the ethical use of data
6. Analysis of the information about road users that could be leaked from C-ITS data and the potential impact on the data subject.

The WP3 Legal and Ethical Aspects has worked in collaboration with the TIARA WP2 PKI Guidance Development and WP4 Privacy Review to achieve the set goals and expected outputs as both WPs have provided input to this deliverable.

The deliverable includes the following chapters: Chapter 2 Methodology includes used methods and Chapter 3 Scope of the study has introduction of C-ITS and definitions of data accuracy and quality. Chapter 4 Responsibility of data accuracy highlights and studies European legislation, policies, contractual agreements, authorities and industry views as well as case studies and legal cases.

The final version of the study includes Chapter on Ethical guidelines and responsibility of data accuracy, that continues to study and analyse responsibility from ethical perspective. Chapter on Communication of data to users then studies how the previous legal and ethical implications should be communicated for the end users. Finally, Chapter on**Error! Reference source not found.** Guidance and recommendations together with Chapter Conclusions summarise and conclude the findings of the study.

2 Methodology

The study origins from the Conference of European Directors of Roads (CEDR) Transnational Road Research Programme Call 2022(2). CEDR brings together the General-Directors of European road authorities. The study's expected outputs were derived from the CEDR Call's Description of Research Needs (DoRN).

The study's research plan and research questions, following the CEDR expected outputs, were presented in the submitted proposal's Work Package 3 (WP3) work description. The plan included the following key methods of literature review, interviews, workshops, and collaboration with the other TIARA project's work packages of security (WP2) and privacy (WP4), CEDR Project Executive Board (PEB) and CEDR Data Call 2022 DROIDS and PRESORT projects.

The selected methods aimed to cover wide range of stakeholders among the public authorities and traffic information service providers to gather best professional expertise in the field.

The literature review was based on academic and industry research papers, conference proceedings, European legislation as well as guidelines and use case papers regarding legal and ethical use of data.

Interviews and workshops were conducted in collaboration with the two TIARA work packages of security and privacy. Contact persons, European platforms, companies and projects with relevant expertise were mapped in collaboration and invited to provide feedback to the study.

Collaboration with the other CEDR Data Call 2022 projects DROIDS, i.e., Maintaining and sharing the digital road infrastructure, and PRESORT, i.e., Improving the use of third-party data by National Road Authorities (NRAs), was limited mainly to the topics of trust and security when offering traffic information services and data.

3 Scope and key concepts

This chapter presents scope of the study, key concepts of used technologies and terms. Scope of the study and key concepts were defined in collaboration with the sponsor of the study Conference of European Directors of Roads (CEDR) and the TIARA project partners. Project stakeholders of independent organisations and individuals with key expertise have also provided input for the project scope.

3.1 Scope of the study

Scope of the study limits primarily to Cooperative Intelligent Transport Systems (C-ITS). Secondary technologies also include Intelligent Transport Systems (ITS).

The goal of the work packet was to review the legal and ethical ramifications for NRAs when making use of C-ITS data, and of how these change the role of the NRA. Therefore, the primary technology studied in the TIARA project and this work package is C-ITS.

The secondary technologies included in the study are Intelligent Transport Systems (ITS). Although ITS have different standards and specifications than C-ITS, it was seen beneficial to have broader views and experiences on data accuracy, quality and accountability, and the consequences of inaccuracy. While C-ITS services have been implemented in recent years at the European roads, there is significantly longer experience on traditional ITS services and data accuracy. Furthermore, many ITS services have similarities with the current C-ITS services, e.g., so called Day 1 services, as the main difference of these services comes mainly from used communication medium, standards, specifications and communication protocols. For example, road operator may share slippery road warning to road users using ITS or C-ITS.

3.2 Cooperative Intelligent Transport Systems (C-ITS)

This chapter provides a short introduction to Cooperative Intelligent Transport Systems (C-ITS) and related technologies that are referenced in this study. More detailed definitions of the topics can be found from the other CEDR TIARA project deliverables.

Cooperative Intelligent Transport Systems (C-ITS) is a subset of standards for Intelligent Transport Systems (ITS). C-ITS services exchange trusted and secured data between vehicles, roadside infrastructure, control and services centres in the cloud, other road users. European framework for trusted and secure C-ITS communication, using Public Key Infrastructure (PKI), is the European Union (EU) C-ITS Security Credential Management System (EU CCMS). (ETSI, ISO CEN 2020, C-Roads WG2 TF2, European Commission)

Intelligent Transport Systems (ITS) use information and communications technology (ICT) in transport including infrastructure, vehicles and users as well as traffic and mobility management. Also, interfaces with other modes of transport are included. ITS aims to improve transport safety, reliability, efficiency and quality. (ETSI 2018, 2010/40/EU)

C-ITS services are ITS services that are provided using V2X communications as agreed in C-ITS. specifications. C-Roads Platform defines C-ITS service as “a clustering of use cases based on a common denominator, for example, an objective such as awareness or a context like road works. Services are also known as ‘applications” (C-Roads WG2 TF2). C-ITS services in Europe have been proposed in European Union strategies and studies, such as European Commission COM(2016) 766 and C-ITS Platform (2016). (European Commission (2021) CCAM)

C-ITS specifications and definitions in Europe have been produced in C-Roads Platform. The

C-Roads specifications comply to C-ITS standards. The C-Roads Platform activities have been co-funded by the European Union Connecting Europe Facility (EU CEF). The platform is a joint initiative of European Member States and road operators for testing and implementing interoperable C-ITS services for European road users. CAR 2 CAR Communication Consortium (C2C-CC) has developed the Basic System Profile, which has been harmonised in C-Roads specification for road infrastructure. C2C-CC members include European and international vehicle manufacturers, equipment suppliers, engineering companies, road operators and research institutions. (C-Roads Platform, C2C-CC)

C-ITS actors and roles include a great number of public and private entities with different responsibilities with a joint aim of C-ITS service operations coordination. The four top-level roles have been defined in the ISO TS 17427-1 as in the Figure 1 below.

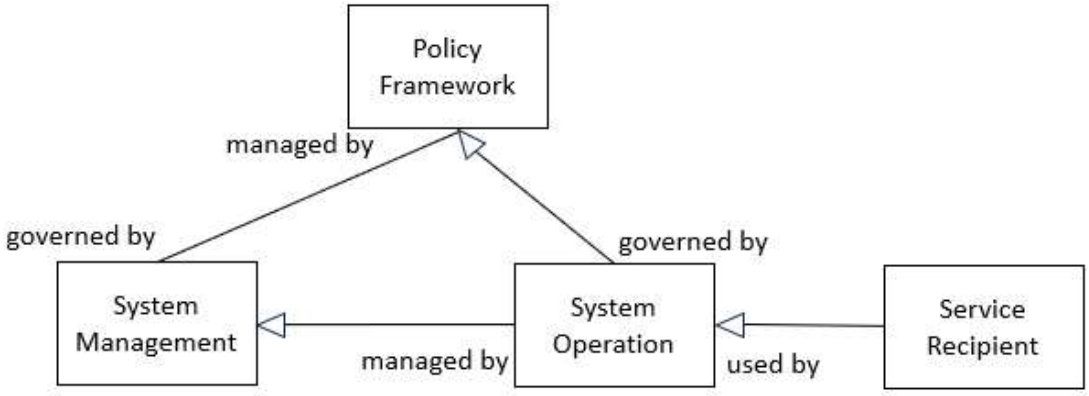

Figure 1 C-ITS roles and responsibilities adapted from ISO TS 17427-1.

C-Roads Platform WG1 C-ITS Organisation draft report titled as “Ecosystem for fully operational C-ITS service delivery – The infrastructure perspective” (2022) and C-Roads Platform ’Report on legal structures’ (2018) presents key roles which are summarised in Table 1 C-ITS actors and roles.

Table 1 C-ITS actors and roles.

Actor	Roles
Public Authority	Government or other public administration operator, such as national, regional, local (e.g., municipality) or other person performing their legal duties.
European Commission	Politically independent executive body of the European Union. Supports for example in C-ITS related research, implementation, investments, legislation and coordination.
Infrastructure operator	Road operator, rail network operator, public transport rail network operator or a third party as a concessionaire on behalf of a public authority, responsible for operating a specific transport infrastructure.
Component and equipment suppliers	Companies that for example are manufacturing of equipment, materials, spare parts and components for C-ITS services.
Automotive industry	Original Equipment Manufacturers (OEMs), i.e. vehicle manufacturers as well as their device and software providers.
Mobile Network Operators	Mobile communications network provider (e.g., 4G and 5G). Provides of communication networks for vehicles and

	infrastructure, and a license to operate the network as an operator.
Service provider	Third-party service providers, such as map producers and companies that provide telecommunications services as a service, offering access to for example road operators and equipment manufacturers to the data and geomessaging technologies needed to produce C-ITS services.
C-ITS service operators	Road operator, an original equipment manufacturer or a third party such as a map manufacturer or an information traffic service provider that provides C-ITS services to an end user or another organization. Also supporting and planning the platforms required by the services (e.g. cloud services).
National Access Point (NAP) provider and nominated body	Provides access, exchange and re-use of traffic-related data. Requirements are part of the ITS directive and its delegated regulations. Possibly supports and implements some C-ITS functions. Conformity is assessed by nominated bodies.

It should be noted that also many C-ITS-like services exist that provide messages of similar actual content but not fully aligned with the C-Roads specifications. Most of the conclusions in this deliverable likely apply to these services as well.

The Automated Driving System (ADS) of an Automated Vehicle (AV) can at least partially perform a driving task without human driver input. ADSs and AVs are part of ITS. In an *Autonomous vehicle, the ADS* can similarly perform a driving task without a human driver, but the vehicle differs from AV by not using communication technology. A *connected vehicle* on the other hand can communicate with infrastructure (Vehicle to Infrastructure (V2I) or Infrastructure to Vehicle (I2V), with other environment (Vehicle to Everything, V2X) or with other vehicles (Vehicle to Vehicle, V2V) using wireless communication technologies.

3.3 Data accuracy and quality – standards and specifications

The ISO (International Organization for Standardization) 8000 series provides frameworks for improving data quality for specific kinds of data. The scope includes for example data quality general aspects, governance, management, assessment as well as master and industrial data.

Data accuracy is defined in ISO 8000-2:2022 Data quality part 2: Vocabulary (3.8.10), which defines terms related to data quality, as follows:

> *"Quality of data in respect of the represented value agreeing with the corresponding true value to a degree necessary for an intended purpose"*

Data quality is furthermore defined in the similar ISO 8000-2:2022 standard (3.1.3) and ISO 9000:2015 as "*degree to which a set of inherent characteristics of an object fulfils requirements*." For example, an organisation has needs or expectations, i.e., set of requirements, that it includes to a data specification. Furthermore, relevant inherent characteristics of the data determine how to interpret the value, e.g., traffic information inherent characteristics could include location coordinates with preferred latitude and longitude accuracy.

Data accuracy depends on the details of the data representation, subject matter and purpose to which the user intends to put the data. For example, traffic information service provider might have a requirement for a location accuracy of the data that needs to be inside of an accepted

reference value (as true value might be difficult to obtain). There are no universal specifications for data accuracy. (ISO 8000-2:2022)

Following terms and definitions are related to data quality role in the ISO 8000-2:2022:

- *Responsibility*: combination of activities, decision making and achieving outcomes, where the combination is performed by a specified party.
- *Role*: set of responsibilities, where the set can be assigned by an organization to a person and this assignment directs the person to perform each responsibility.

The ISO/IEC 25000:2014 Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) series also deals with data quality. The ISO/IEC 25012:2008 includes a data quality model for information systems (ISO/IEC 25000:2014, ISO/IEC 25012:2008, Datos, ISO25000). Data quality is defined as follows:

> *"Degree to which the characteristics of data satisfy stated and implied needs when used under specified conditions."*

The Data Quality model presented in the Figure 2 Data Quality characteristics main categories (ISO/IEC 25012). below includes main characteristics that must be taken account when assessing the properties of the intended data product are established.

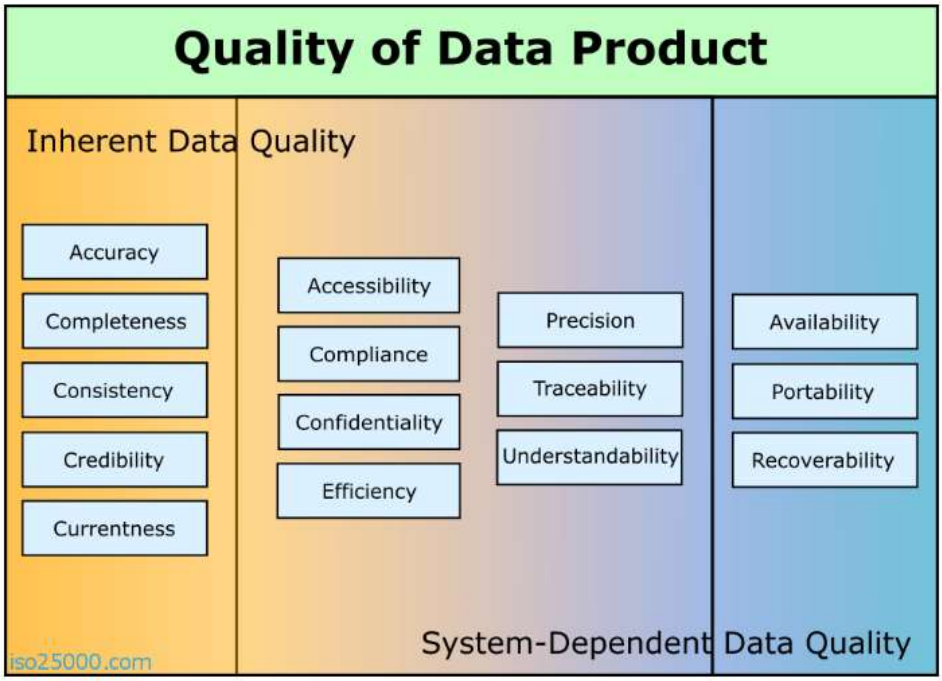

Figure 2 Data Quality characteristics main categories (ISO/IEC 25012).

European ITS Platform (EU EIP) has published C-ITS Quality package for data and information quality in the context of CITS. The EU EIP report refers to the earlier mentioned ISO 9000:2015 standard on how quality is understood and proceeds to question on what does an "object" represent in the field of C-ITS quality. Higher level quality objects in the ITS standardisation include (EU EIP SA 4.1):

- System Quality (e.g. availability of an entire technical system)
- Device Quality (e.g. reliability of devices within a system)
- Functional Quality (e.g. efficiency of an expected function of the system)

- Data Quality (e.g. accuracy of data used for a function)

Higher level of quality object Data Quality, e.g. accuracy of data used for a function, is mainly related. Also, system and device quality are touched on. It is noted, that “for C-ITS services, also the quality of a single message may be important, as there are specific safety and efficiency implications related to each single message.” (EU EIP SA 4.1)

4 Responsibility for data accuracy

Data accuracy and quality in general are essential with regard to the impacts of the data via the services utilising the data – the better the quality is, the more the users are trusting on it (having learned that the quality is good) and are also willing to use it providing the benefits aimed for by the service provider; and to the contrary, poor service quality can even have negative impacts on user benefits.

Poor data quality and accuracy with regard to user expectations can contribute to, for instance, road accidents, transport chain delays and unfortunate user decisions, for which the service provider and/or the data provider could be regarded to be responsible for. Such cases could lead to financial and image-related losses to the parties regarded as liable.

The following framework with five elements in the corresponding chapters were reviewed to evaluate road authority responsibility to ensure that data is accurate, and the accountability when inaccurate data is sent:

1. European legislation,
2. Member States national legislation,
3. Member States and authorities' contractual agreements,
4. authorities and industry views on data usage and responsibilities, and
5. case studies and legal case decisions.

4.1 European legal framework

This chapter reviews the European legal framework related to Cooperative Intelligent Transport Systems (C-ITS) and Intelligent Transport Systems (ITS). Aim is to review Member states, national road operators and public authorities' C-ITS and ITS deployment responsibilities and references to data accuracy and quality.

European Parliamentary Research Service (EPRS) briefs according to the Lisbon treaty's hierarchy of sources of EU law (Figure 3): "legislative acts (author's note: such as directive) come directly after the Treaties (including the Charter of Fundamental Rights) and the general principles of EU law. Legislative acts stand above any other (non-legislative acts) of the EU institutions, agencies, and bodies" (European Parliamentary Research Service, EPRS). These laws are referred in the following chapters.

The delegated acts are legally binding acts, directly applicable and therefore not be transposed into national legislation. With delegated acts the Commission may supplement or amend non-essential parts of EU legislative act. (European Commission Types of EU law, EU Monitor)

Figure 3 Hierarchy of sources of EU law. (European Parliamentary Research Service, EPRS)

4.1.1 Directive of Intelligent Transport Systems

The European Union council adopted a new revised framework for the deployment of Intelligent Transport Systems (ITS) (2023/2661) in November 2023. The revision updated the previous ITS Directive 2010/40/EU. The framework directive supports coordinated use of Intelligent Transport Systems (ITS) across the Union Member States borders.

The directive applies to ITS applications and services and provides development actions for specifications, and when necessary, standards, in the following priority areas (Directive 2023/2661, Article 2, paragraph 1, Annex I):

(a) Priority area I: Information and mobility ITS services.
(b) Priority area II: Travel, transport and traffic management ITS services.
(c) Priority area III: Road safety and security ITS services.
(d) Priority area IV: ITS services for cooperative, connected and automated mobility.

Within the priority areas the Commission has adopted following priority actions: a) multimodal travel information services, b) real-time traffic information services, c) road safety related minimum universal traffic information, d) eCall, e) information services for safe and secure parking places and e) reservation services for safe and secure parking places for trucks and commercial vehicles.

The main difference between the ITS Directive (2010/40/EU) and the latest revised Directive in 2023 comes from the revision requirement for Member States to ensure that where the underlying information already exists, data are made available for geographical coverage for each data type defined in the Directive. The Directive sets further dates when the data is to be made available via a national access point. The Directive in 2010 required Member States to ensure that the specifications adopted by the Commission were applied to ITS applications and services, when these are deployed.

Information in scope of the Directive, referred as 'underlying information', can be found from the Directive's Annex III that lists considered data types as presented below in Table 2. Analysis of the data type subcategories and relevance for C-ITS services and road authorities is also included in the table. The underlying information is defined with reference to road authorities' responsibilities as follow in the Article 4 (2023/2661):

> *"(25) "underlying information" means information within the scope of this Directive that has been determined to be relevant for informing road and ITS users, in*

particular by road authorities where they are responsible for such information."

Table 2 Analysis of the Directive of Intelligent Transport Systems (ITS) data type subcategories relevance for C-ITS services.

Data type category	Analysis of data type subcategories relevance for C-ITS services
1. Data relating to the provision of EU-wide road traffic information and navigation services (as referred to in Annex I, Priority area I, paragraphs 1.2, 1.3): **1.1. Category: Static and dynamic traffic regulations, where applicable, concerning:** **1.2. Types of data on the state of the network:**	1.1 Static and dynamic traffic regulations such as speed limits can be communicated (I2V) to road users via In-Vehicle Signage (IVS) service Traffic Signs use case (IVS-TS). (C-Roads TF2) 1.2 Types of data on the state of the network includes road and lane closures as well as roadworks, which are included in the C-Roads specifications and have high relevance for road authorities.
2. Data relating to information and reservation services for safe and secure parking places for trucks and commercial vehicles (as referred to in Annex I, Priority area III, paragraph 3.2):	The C-Roads specifications include In-Vehicle Signage service Free Text (IVS-FT) use case.
3. Data on detected road safety-related events or conditions relating to road-safety-related minimum universal traffic information (as referred to in Annex I, Priority area III, paragraph 3.3):	Safety Related Traffic Information is highly relevant for C-ITS services and available in C-Roads specifications, including for example temporary slippery road, obstacles on the road, accident areas and exceptional weather conditions.
4. Static multimodal traffic data for EU-wide multimodal travel information services (as referred to in Annex I, Priority area I, paragraphs 1.1 and 1.3):	Multimodal travel data is not at the moment of writing this study available via C-ITS services, e.g. location of identified access nodes and information on accessibility of access nodes.

Requirements are set for specifications and standards that belong to the priority areas in the Directive Annex I Priority Areas. The priority area IV "ITS services for cooperative, connected and automated mobility" includes requirements for C-ITS information and warning services as well as C-ITS support to Cooperative Connected and Automated Mobility (CCAM).

Priority area III Road safety and security ITS services subcategory of 3.3 Specifications for road safety-related minimum universal traffic information states as follow (underlined sections in the text are considered important):

> *"The definition of minimum requirements, for road safety-related 'universal traffic information' provided, where possible, free of charge to all users, as well as their minimum content, based on:*
>
> *3.3.1. the availability and accessibility of accurate data on safety-related events and conditions needed for safety-related traffic information and incident management services"*

Priority areas I and II subcategories, that are related to C-ITS, 1.2 EU-wide road traffic information and navigation services, 2.1 traffic and incident management services and 2.2 mobility management services include the following:

> *"the timely updating of available… [Author's note: road and traffic data… real-time traffic information…]"*

Security credential management system for the EU C-ITS and specifications for the priority area "IV ITS services for cooperative, connected and automated mobility'" is adopted by the Commission who will cover the EU CCMS and included roles (Article 10). **Personal data** processing such as location data is also required to be carried out in accordance with European Union law of personal data and privacy as stated in the recital 23.

Member state responsibilities in addition to ensuring the underlying information already existing data is made available, include to ensure ITS services specified in the Directive 2023/2661 are deployed according to set coverage and dates. These ITS services are defined as Road safety-related minimum universal traffic information (SRTI) services.

4.1.2 Delegated acts of the ITS Directive priority areas

According to the ITS Directive the Commission may adopt delegated acts. Delegated acts can cover no more than one priority area and be adopted for each of the priority actions. Among the ITS Directive priority areas (see previous chapter) adopted delegated acts the following were seen relevant for this study when evaluating data accuracy and responsibilities (European Commission Mobility and Transport):

- Commission Delegated Regulation (EU) No 886/2013 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users.
- Commission Delegated Regulation (EU) 2022/670 of 2 February 2022 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of EU-wide real-time traffic information services. (repealing the proceeding Commission Delegated Regulation (EU) No 962/2015).

Real-time traffic information (RTTI) (EU) 2022/670 delegated act will repeal the Delegated Regulation (EU) 2015/962 starting from 2025. The RTTI Act aims to establish "specifications necessary in order to ensure the accessibility, exchange, re-use and update of data by data holders and data users for the provision of EU-wide real-time traffic information services, and to ensure that these services are accurate and available across borders to end-users." *Real-time traffic information* is defined in the RTTI Act as "information derived from any data on the infrastructure, data on regulations and restrictions, data on the state of the network and data on the real-time use of the network, or the combination thereof."

The recitals 16 and 21 in the RTTI Act state as follow regarding road operators et al. responsibilities and data quality. These recitals are later further reflected in the regulation's articles (underlined sections in the text are considered important):

> *(16) "…road authorities, road operators, holders of in-vehicle generated data, recharging and refuelling-related stakeholders, tolling operators and real-time traffic information service providers should make the data, corresponding metadata and information on the quality of the data discoverable and accessible to other road authorities, road operators, recharging and refuelling-related stakeholders, tolling operators, real-time traffic information service providers, digital map producers via the national or common access point."*
>
> *(21) "Member States and ITS stakeholders should be encouraged to cooperate to agree on common definitions of data quality with a view to use common data quality indicators throughout the traffic data value chain, such as the completeness, accuracy and up-to-dateness of the data, the acquisition method*

> *and location referencing method used, as well as quality checks applied. They should also be encouraged to work further to establish associated methods of quality measurement and monitoring of the different data types. Member States should be encouraged to share with each other their knowledge, experience and best practices in this field in the on-going and future coordination projects."*

The RTTI act covers following data type categories:

1) The types of data on infrastructure
2) The crucial types of data on regulations and restrictions
3) Other types of data on regulations and restrictions
4) The crucial types of data on the state of the network
5) Other types of data on the state of the network
6) The types of data on the real-time use of the network

Member state responsibilities include setting up a national access point to offer a single point of access for data users, including data updates, provided by the data holders. The RTTI act continues by defining accessibility, exchange and re-use of data for each of the data type categories to facilitate the provision of real-time traffic information services. The data is given following conditions for each of the data type categories, here given an example of Article 5 paragraph 2:

> *2. The data referred to in paragraph 1 and the corresponding metadata including information on the quality thereof shall be accessible for exchange and re-use by any data user within the Union:*
>
> *(a) on a non-discriminatory basis;*
>
> *(b) following minimum quality requirements that Member States shall agree upon in cooperation with relevant stakeholders;*
>
> *(c) within a time-frame fitting to the reliable and effective use of the data to create real-time traffic information;*
>
> *(d) via the national or common access point referred to in Article 3.*

The following paragraph 3 regarding data on infrastructure, regulations and restrictions and state of the network also mentions as follow:

> *3. Data users using the data referred to in paragraph 1 and data holders shall collaborate in order to ensure that any inaccuracies related to the data are signalled without delay to the data holder from which the data originates.*

The RTTI act Articles 8–11 include requirements of updating each of the data type categories. The updates are required to concern as a minimum the following parameters which are here shortened as a summary:

(a) the type of data
(b) the location of the condition
(c) the type of update (modification, insertion or deletion)
(d) the description of the update
(e) the date on which the data has been updated
(f) the date and time
(g) the quality of the data update as defined in quality requirements that Member States shall agree upon in cooperation with relevant stakeholders.

Article 12 Assessment of compliance paragraph 2 (a) states that the Member States may

request from any data holders and data users a description of the data, digital map or real-time traffic information services they provide as well as the information on the quality thereof and the conditions of re-use of these data. This information can be used to assess the compliance.

Article 13 states that Member states shall provide Commission information about the geographical scope of the data accessible via the NAP, changes to the primary road network and to the data content of real-time traffic information services and their quality, including the criteria used to define this quality and the means used to monitor it.

As a summary, the minimum quality requirements and data updates (having an impact to data quality) are referred in the RTTI act, although not specified by technical details, and instead stated to be accomplished and agreed in Member State cooperation with relevant stakeholders. The collaboration referred in the RTTI delegated act has been further established by the Member States in the NAPCORE project building on the earlier work in the area by EU EIP.

NAPCORE (The National Access Point Coordination Organisation for Europe) is the European Union co-funded organisation to coordinate and harmonise European mobility data platforms, i.e., National Access Points (NAP) setup, data access interfaces and data formats as well as standards. (NAPCORE)

Safety Related Traffic Information (SRTI) (EU) 886/2013 establishes the specifications for the deployment of and operational use of road safety-related minimum universal traffic information free of charge to users on a European Union level. The Act applies also to the provision of road safety-related traffic information services on the trans-European road network.

Road safety-related minimum universal traffic information means according to the Act “any extracted, aggregated and processed road safety-related traffic data, offered by public and/or private road operators and/or service providers to end users through any delivery channels.” List of SRTI events or conditions that are covered by the SRTI act are presented in the Article 3 as follows:

(a) temporary slippery road;
(b) animal, people, obstacles, debris on the road;
(c) unprotected accident area;
(d) short-term road works;
(e) reduced visibility;
(f) wrong-way driver;
(g) unmanaged blockage of a road;
(h) exceptional weather conditions.

Member states, public and private road operators as well as service providers are set requirements and responsibilities in the SRTI act that include the followings summarised and highlighted here from data accuracy and responsibility perspective:

- *Public and private*: items that the information provided shall include are location, category of event or condition and driving behaviour advice, where appropriate. Removal of the information if it ceases to subsist or modification if the event or condition changes. (Article 4)
- *Member States*: designate sections on the trans-European road network where traffic and safety conditions require the deployment of the SRTI service. (Article 5)

- *Public and private*: set up or use the means to detect events or identify conditions and shall collect the relevant road safety-related traffic data. (Article 6)
- *Public and private*: share and exchange the SRTI data/information they collect being accessibly by any user via NAP in DATEX II (CEN/TS 16157) format or any fully compatible and interoperable with DATEX II. Requirements include timely provision of the information service and timely renewal and quality of data. (Article 7)
- *Public and private*: SRTI to widest reach of end users free of charge prior to any other non-safety related traffic information. Public and private entities shall collaborate to harmonise the presentation of the content of the information provided to end users and inform of existence of the information service and its coverage. (Article 8)
- *Member states*: national body to assess and randomly inspect the public and private fulfilled requirements in Articles 3 to 8. (Article 9)
- *Public and private*: submit or update a declaration of compliance according to requirements to a national body. (Article 9)

As a summary, the SRTI delegated act sets several requirements for the Member States and public and private road operators to establish SRTI road sections, information and services. Also, means to detect events or identify conditions as well as share the SRTI information via NAP free of charge to wide reach of end users. Timely SRTI provision, renewal and data quality are also needed to be ensured.

4.1.3 Other C-ITS relevant European legislation

A C-ITS delegated act was drafted between 2017 and 2019 by the European Commission. The C-ITS act C/2019/1789 was published in 2019, but it was objected against by the Council of the European Union. Although there was no C-ITS specific legislation in force in Europe at the moment of writing this study, the European Commission may continue its draft proposal and adopt delegated acts in according to the ITS Directive (2023).

Due to the importance for the road authority's responsibility of data accuracy, the draft C-ITS delegated act (2019) content is here highlighting some of the relevant parts in consideration of the study topics. First, the Article 1 paragraph 1 subject matter and scope:

> *This Regulation establishes specifications necessary to ensure compatibility, interoperability and continuity in the deployment and operational use of Union-wide CITS services based on trusted and secure communication.*
>
> *It lays down how vehicle-vehicle, vehicle-infrastructure and infrastructure-infrastructure communication is to be conducted by means of C-ITS stations and how C-ITS stations are to be placed on the market and put in service, to enable the provision of C-ITS services to ITS users.*

Paragraph 2 continues, that the regulation applies to all C-ITS stations, i.e., hardware and software components to exchange trusted C-ITS messages in C-ITS services, in the field of transport. Paragraph 3 further states, that Member States shall designate the part of their transport network infrastructure that is equipped with C-ITS stations. Therefore, the draft C-ITS act would have applied to C-ITS stations if Member States had deployed them in part of their road network.

The draft C-ITS act continues in separate chapters to sets requirements for the C-ITS stations, placing the C-ITS stations on the market, putting in service and operation of C-ITS stations, security an implementation (not put in force) as well as final provisions. The Annex I contain the service profiles for the C-ITS priority services and their required information quality value in the DENM data element.

Protection of personal data is guaranteed in the European Union fundamental rights: Everyone has the right to the protection of personal data concerning him or her (EU Charter of Fundamental Rights). The European Commission Draft C-ITS act (C/2019/1789) states that processing of personal data must be carried out in accordance with the EU law in particular the General Data Protection Regulation (GDPR) and the e-Privacy Directive Data privacy legislation in Europe. The previously mentioned legislation and other policies related to personal data protection are studied more in detail in the TIARA project's Work Package 4 Privacy in C-ITS Applications deliverable.

Security architecture legislation, related to the ITS Directive (2023) requirements, supported by a public key infrastructure (PKI) is required by the C-ITS services to exchange trusted and secured data. The European security framework for trusted and secure C-ITS communication, using Public Key Infrastructure (PKI), the European Union (EU) C-ITS Security Credential Management System (EU CCMS) is introduced and studied more in detail in the TIARA project's Work Package 2 PKI Guidance development and its deliverables.

Open data and the re-use of public sector information has been regulated in the Directive (EU) 2019/1024, i.e., successor of Directives 2003/98/EC and 2013/37/EU. The Directive aims to promote the use of open data and stimulate innovation in the market. It sets out the minimum rules governing the re-use and practical arrangements for facilitating the re-use of such as documents and research data of public sector bodies of the Member States. The Directive states that any use of the documents shall be non-discriminatory and fair trading as well as transparent. Use of standard license that are not subject to conditions is encouraged, i.e., set of predefined re-use conditions in a digital format, preferably compatible with standardised public licences available online.

4.2 Member States national legislation and policies

European Union regulations are applicable throughout the Member States as introduced in the beginning of the chapter. Unlike delegated acts, the EU Directives are not directly applicable in the Member States but require national laws to incorporate their rules into national legislation. Member States are allowed to decide the form and means of national legislation. The Member States take part in the European Union legislative process, including commenting and voting. Directives specifies by which deadline the Member States must adopt national measures, which is then also notified to the European Commission who examines and ensures the transposed law. (EUR-Lex Transposition, European Parliament legislative procedure)

National legislation is adopted in each of the Member States. The national legislation, with safety related roles and responsibilities clearly set, often includes legally binding regulation that impacts C-ITS and ITS data and information exchange. National regulation can for example include road authorities' tasks and responsibilities related to traffic control and management, which furthermore may relate to responsibilities on data accuracy and quality.

Government has the main national responsibility for the provision of safe digital and physical road infrastructure as well as safe operation of the road network. Government fulfils this obligation through the national road authority. (PIARC Road Safety Manual)

4.3 Member States and authorities' contractual agreements and incentives

Service Level Agreements (SLAs) are signed between the road authorities and traffic information service providers to agree on the quality of data to be delivered. These contracts are not disclosed due to being private between the contract parties. Although individual

contracts are not available, these contracts provide one possible example of a solution where public and private stakeholders agree on the roles and responsibilities including data accuracy and quality.

Open data offered by the road authorities can also include terms of use and statements of no liability for specific types of data use. As supported in the Open Data Directive, the road authority terms of use might include standard license such as Creative Commons, which can give the user right to copy, modify and further distribute the data in original or modified form. Meanwhile, warranties or liability for the material can be excluded. (Creative Commons 4.0)

Data for Road Safety is the name selected for the European Safety Related Traffic Information (SRTI) Ecosystem. The Ecosystem can be seen as a practical platform for the implementation of the SRTI delegated act 886/2013. The Ecosystem partners include OEMs, service providers and Member States. The exchange of information between the Ecosystem parties is done under the terms and conditions of the Multi Party Agreement which creates a trust domain for the exchange.

The SRTI content is exchanged within the Ecosystem in-kind on the basis of reciprocity, i.e., mutual benefit of SRTI between the parties without financial compensation. Therefore, the agreement fulfils the delegated act requirement to provide SRTI free of charge to the end user. The agreement sets requirements for the provision and use of content. The rights of the States and/or public authorities to use SRTI content are different from those of the private industry parties.

The Traveller Information Services Association (TISA) has introduced a five-star quality rating for real-time traffic information (RTTI), such as Road Works data, that includes minimum quality requirements for the road authority data. By filling the minimum requirement of data quality (three stars), road operator or authority data would be mostly likely used by the service providers, therefore giving the road authorities/operators an incentive to improve the data quality. (TISA Draft proposal 2024)

4.4 Case studies and legal case decisions

The interviews with public authority and industry representatives did not bring up **European legal cases** or harm caused when using incorrect data and thereby leading to legal consequences. The main reason for this was considered to be the nature of the data, i.e., on what characteristics and purpose the data has been provided. Data provided was considered not being safety nor financially critical data to third parties, but rather data that was meant for informative uses only.

Road users may for example access information about the current traffic situation and information regarding road works. If the data would be incorrect, it would create inconvenience such as longer travel time to selected destination at worst, but since the data is provided for informative purposes only, legal consequences are not to be expected.

Weather information and especially detailed location information about slippery road conditions were given by one road authority as an example of data that are considered potentially risky to provide for the road user, and a potential legal issue. Road authority providing slippery road information in a large scale can cause drivers to expect the road not be slippery if such is not informed by the authorities. Slippery road conditions can depend on driver's personal preferences and experience on winter road driving as well as the tyres on the vehicle. Also, if vehicle manufacturers and traffic information service providers already provide such information with better accuracy (due to vehicle data), it might not be useful to compete. Previous studies have shown that there were no accidents in winter conditions where the driver would not have known that it could be slippery.

Global legal cases outside of Europe can also shed light on possibly issues, that are not yet seen Europe or very little, or were not found during this study. The following cases are reported from the study's interviews and news articles.

When looking at outside of Europe, to United State of America, some interviewees raised examples of data sharing issues that are many ways opposed to the ones in Europe. In US the contracts can include many protection clauses that hinder data sharing. Good data sources can become unsustainable to use due to conditions set in the contracts, i.e., risk of being sued causes a need of lawyer resources and can scare away any interested data feed users. Therefore, even with a good data platform, the traffic information service providers, can struggle to build applications due to legal risks.

4.5 Authorities and industry views on data use and responsibilities

This chapter reviews feedback and comments received from the authorities and industry regarding data use and responsibilities. The methods were interviews, emails, and a workshop session. The feedback has been highlighted below as a bolded text to indicate main topic of the feedback.

4.5.1 Road authorities' views

Evaluation of data quality and usage helps to act on the data quality that the authority is responsible. Lack of feedback about the usage of the data feed from the industry can in some cases make it difficult to assess the data quality. For example, usage of TPEG (Transport Protocol Experts Group), i.e. data protocol suite for traffic and travel related information, can be only informed very generally on how many countries or how many vehicles, but not per country level information. The reason for this is the agreements that limit any publication about clients' names and data that is being used and its impact.

Terms of use and license agreements in most cases applied by the authorities and industry state that the content owners are not liable for flawed data and information provided are only recommendations for user's own decision-making process. For example, National Access Points (NAP) in the Member States, depending on the respective license agreements, may contain such license terms that content providers "shall ensure the quality and correctness of the data." The terms of use may not specify any liability of the content provider nor that the provided information may be used for information purposes only.

4.5.2 Traffic information service providers' views

Numerous global, regional, national and local traffic and traveller information service providers use road authority and road operator provided data as a basis for their services. Therefore, the traffic information service providers are not only the largest users of the road authority data, but also the ones constantly working and analysing the data quality that the authorities provide.

European legislation requirements for data accuracy and quality were seen vague lacking concreteness. ITS directive was seen as the most important legislation together with delegated acts.

The latest revision of Real-time traffic information (RTTI) (EU) 2022/670 delegated act was the most mentioned one in the interviews.

TISA has promoted the five-star quality rating for real-time traffic information (RTTI) that includes minimum quality requirements for the road authority data as introduced in the Chapter 4.3. One interviewed TISA member was hopeful that the proposed ratings, which have been done in collaboration in RTTI data quality workshops, would be successfully implemented and

taken up by the Member States authorities. (TISA 2023)

NAPCORE has been working with the data quality but with quite limited resources.

Industry standards for assessing the quality of traffic information in the services for drivers such as QBench are followed.

Terms of service use applied by the traffic information service providers in their products include strong disclaimers of the nature of the data as it should be used for guidance support only and the driver remains in charge of following local regulations.

Open data quality that the road authorities provide was identified as a concern in some parts. Although many authorities provide good quality of traffic information, there are still several occasions where the traffic information service providers were not able to use public open data feeds due to poor quality. Free data can often mean poor quality. Main reason for some the authorities' poor open data quality was estimated to be the lack of funding of government data operation. For those authorities struggling with data quality issues and insufficient funding, it was suggested even to have a charging for accessing their data feeds, if increased funding from the government is not received and if that results to better quality of the data feed.

4.5.3 Workshop on data accuracy and road operator responsibilities

TIARA workshop was arranged on 7th of May 2024 which included a session on data accuracy and road operator responsibilities. Six participants (n=6) took part in the session. The participants represented public authority, private industry and research organisations. The research framework and the five elements reviewed in this chapter (European and national legislation, contractual agreements, case studies as well as public and private stakeholders' views) were introduced to the participants with related questions (APPENDIX 1). The feedback was qualitatively reviewed, and results included for relevant parts in the previous chapters. The following is a summary of the workshop results.

European legal framework literature findings were presented as hypotheses for the workshop participants. A question was raised by the participants, what role would the European Commission take in the future to specify data accuracy or quality or would such rather be left to the road operators and member states. The road operators and member states could also subcontract such activities to a data clearing house or third-party. Distinction might be needed for example between a Public Transport Operator's and private companies' data.

The delegated act of Safety Related Traffic Information (SRTI) was mentioned of setting requirements for the Member States and public and private road operators. It was questioned whether CCAM would require additional legislation regarding data accuracy, or whether it falls under existing legislation. The revision of the Product Liability Directive also covers digital products, including software and AI systems. The Revised ITS Directive 2023/2661 does mandate on use of standard interfaces and DATEX II, but more details and for example minimum requirements are needed as they can have a large impact on implementation. It was questioned, how minimum standards and requirements would be then communicated to consumers, as they will likely rely on the data.

Member States national legislation and policies in some countries include policies and rules which advice data quality to be published by the authorities. Other national experiences referred to specific rules that apply on top of the regulation, which makes the authorities further enhance data quality, for example on location data. Even without specific policies, trust itself was seen as an important factor to enhance data accuracy or quality. Authorities further extend data quality rules requirements to subsidiaries and contractors. Also, before a

specific legislation, the data quality requirements need to be understood as they can be very use case specific. For example, emission and speed limit regulations require studies to understand the requirements first. A further important question was raised on how the roles of road operators for data change vary across EU countries? This can affect data quality and responsibility, being part of the European legal framework collaboration between the Member States.

Member States and authorities' contractual agreements including Service Level Agreements were under development in some states. These business contracts concerning for example open data or even B2B2C, require a lot of preparation work which specific data teams can help to manage. Responsibilities need to be clearly defined in contracts or same cases in Terms of Reference (ToR). Contracts or ToRs can be made with for example with road maintenance contractors, which require clear definitions as a contractor might not be interest or aware on timely data updates. **Member States and authorities also have incentives**, which can include data quality ratings. It was questioned whom should assign the star ratings and how are they determined or controlled. Examples mentioned were the TISA (Traveller Information Services Association) and iRAP (the International Road Assessment Programme) star ratings.

Authorities and industry views on data usage and responsibilities included comments on data quality perspective and trust between the stakeholders. *First*, data quality can depend on the perspective of the user and whom you ask, for example some experiences where data provider was satisfied for the results of data quality, but data users dissatisfied. Data quality management can be an issue as the management requires continuous follow up and updates. Just opening or publishing data or once enhancing data quality might not be enough as constant management is needed, otherwise the data quality can decrease in time. *Secondly*, experience in the past shows that OEMs have had distrust of other data sources than their own. They main reason for distrust being safety as OEMs require sensors with certifications what they trust. Meanwhile public authorities may lack safety certifications concerning their sensors and infrastructure, e.g., cameras. When lack of trust and to solve any legal responsibility issues, agreed standards or external trusted quality control could be a solution.

Case studies and legal case decisions were discussed around three topics of data quality knowledge, use cases dependency and available case examples. *First*, liability and responsibility when a data provider shares inaccurate data poses a question whether the provider knew about the poor data quality, and/or the possible inaccuracies and risk involved with it, and still decided to send the data. *Secondly*, data quality is dependent on the use case and sometimes it would be better to warn than not to warn the customers. For example, when sending traffic signal SPAT/MAP information and there is a delay in the system and application User Interface, and there is a doubt whether these could cause harm, there is a liability issue, and you would need to warn users about potential issues in real-time communication. Liability issues were questioned when the current ADAS systems with driver in responsibility are shifting towards higher levels of automation. *Thirdly*, case examples could also be found from mobility data services and their quality control and experiences. One case example from Netherlands was introduced where a tunnel accident occurred when a contractor didn't update information timely which then led to an inaccurate traffic information causing the accident.

5 Conclusions

European legislative framework for Intelligent Transport Systems (ITS) is set by the ITS Directive (2023/2661). The ITS Directive requirement for Member States to ensure that where the underlying information already exists, data are made available for geographical coverage for each data type defined in the Directive. These data types can also be exchanged by C-ITS. Requirements for the standards and specifications include C-ITS and safety-related traffic information (which of many C-ITS services are), where the latter includes minimum requirements for the availability and accessibility of accurate data.

Therefore, there are no direct technical requirements outside of required data formats (DATEX II, etc.) related to C-ITS or ITS data accuracy nor quality in European legislation. However, Member States are required by legislation to set up NAP, make the data available, communicate inaccuracies (in collaboration), provide parameter of the quality of the data update, and follow minimum quality requirements that are agreed in cooperation with relevant stakeholders (RTTI 2022/670). There are further implemented in the Member State, depending on legislation and policies, by the road operator or National Road Authority (NRA).

When a road operator deploys C-ITS services it follows applicable standards and common European harmonised specifications to achieve cross-border interoperability (C-Roads); these standards and specifications include or may include in the future minimum requirements for the data accuracy/quality.

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APPENDIX 1

Presentation material of the TIARA workshop 7th of May 2024 session on data accuracy and road operator responsibilities. The material below includes draft results and questions within the research frameworks five elements.

1. European legal framework

Reviewed European legislation

Directive and delegated acts

- Directive of Intelligent Transport Systems (ITS) (2023/2661)
- Delegated Regulation (EU) No 886/2013... road safety-related minimum universal traffic information...
- Delegated Regulation (EU) 2022/670 of 2 February 2022... EU-wide real-time traffic information services
- Other?

Other C-ITS relevant European legislation

- Draft (not in force) C-ITS delegated act (C/2019/1789)
- GDPR
- Open data directive 2019/1024
- Other?

From legislation and hypotheses

- There are no direct technical requirements outside of required data formats (DATEX II, etc.) related to C-ITS or ITS data quality nor quality in European legislation.
- However, Member States are required by legislation to set up NAP, make the data available, communicate inaccuracies (in collaboration), provide parameter of the quality of the data update and follow minimum quality requirements that are agreed in cooperation with relevant stakeholders (Directive 2023/2661, RTTI 2022/670).
- When a road operator deploys C-ITS services it follows applicable standards and common European harmonised specifications to achieve cross-border interoperability (C-Roads):
  - these standards and specifications include or may include in the future minimum requirements for the data quality.
  - Possible upcoming regulation for C-ITS in Europe.

2. Member States national legislation and policies

National legislation

- European Union regulations, delegated acts, are applicable throughout the Member States. Directives implemented in national laws.
- National laws can include road operator tasks and responsibilities.
- Government has the main national responsibility through the road operator.

Questions

- Member states national legislation use case examples available on road operator data accuracy responsibility?
- Awareness and views on the recommendations from NAPCORE, EU EIP, TISA?
- Other?

3. Member States and authorities' contractual agreements and incentives

Agreements and incentives

- **Service Level Agreements (SLAs)** are signed between the road authorities and traffic information service providers to agree on delivered quality of data – agreements are not disclosed due to nature of contracts.
- **Open data** offered by the road authorities can also include terms of use.
- **Data for Road Safety** is the European Safety Related Traffic Information (SRTI) Ecosystem.
- **The Traveller Information Services Association (TISA)** has introduced five-star quality rating for real-time traffic information (RTTI)

Questions

- **SLA** examples between traffic information service providers and road operators?
- Examples of road operators and public authorities **open data** related quality statement/commitment or data use recommendations?
- Any experiences related to the use of **Data for Road Safety** ecosystem, TISA or similar other data quality recommendations?
- Other?

4. Authorities and industry views on data usage and responsibilities

Examples of feedback received by far

- Lack of feedback about the data usage can make it difficult for the road operator to assess the data accuracy.
- Terms of use and license agreements limit liabilities of road operator.
- European legislation is vague on data quality or accuracy, but several initiatives ongoing between European public and private stakeholders (e.g., NAPCORE, DFRS, TISA).

Questions

- Use cases and previous experiences on data usage and responsibilities?
- Experiences about open data quality?
- Experiences of road operators or OEM and service providers paid data feeds and their data quality? Does free (open data) feed quality differ from paid data feed?
- Terms of use experiences from industry?
- Does your organisation use ethical guidelines? If yes, what ethics aspects does it cover?

5. Case studies and legal case decisions

Example use cases received

- Data provided might not be critical to third parties, but rather data that may be used for information purposes.
- Lack of trust to road operator data by OEMs and service providers due to possible legal liability issues.
- United States has ongoing Google Maps legal case about inaccurate data provision as a cause of an accident.
- Navigation apps (re)routing traffic to unwanted routes, roads or streets.

Questions

- Any case studies or legal case decisions about data accuracy or quality?