



# Data content requirements, existing gaps, data dictionaries and supporting material (Part b)

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## Abstract

Concerning the challenges that the transportation sector is facing, valid data flows of increased spatial and mode coverage are essential for the development of Intelligent Transport System (ITS) services and applications capable of ameliorating safety, efficiency, reliability, resiliency, and environmental performance across and within transportation modes and networks. In line with this concept, the European Commission (EC) has proposed and legislated the deployment of dedicated platforms, termed National Access Points (NAPs), to facilitate the discoverability, exchange, and distribution of critical ITS-related data at a national (or even cross-border) level/scale. This proposal was first made within the context of the Delegated Regulations (DR) No. 885/2013, 886/2013, 2015/962, and 2017/1926 supplementing the ITS Directive (2010/40/EU) and is maintained in newer Delegated Regulations repealing current ones (e.g., Delegated Regulation 2022/670). Building upon the descriptions included in these legislative documents, a NAP can be addressed as a single digital platform providing a national-level centralized or decentralized access to properly formatted, machine readable ITS-related data accompanied by the appropriate metadata.

The aim of this report is twofold. Firstly, it aims to provide an overview of all DRs (current and updated) by focusing on their structure and content to extract critical requirements for the operation of NAPs. The second objective of this report is to identify gaps between current and required NAP implementations considering, on the one hand, the identified requirements (specifically the ones resulting from the existing/applicable DRs) and, on the other hand, the results of the first and second surveys on NAP and NAP data availability monitoring conducted in the context of NAPCORE's Milestones M3.2 and M3.3. These results primarily provide insight into the current state of NAP data availability across Europe, but also into additional aspects, such as the extent to which metadata are published by NAPs of Europe and their underlying implementation/operational architecture.



## Abbreviations

Abbreviation	Meaning
API	Application Programming Interface
CAT	Core Alignment Team
C-ITS	Cooperative Intelligent Transport System
DR	Delegated Regulation
EC	European Commission
EU	European Union
GTFS	General Transit Feed Specification
IATA	International Air Transport Association
ITS	Intelligent Transport Systems
MaaS	Mobility as a Service
MDMS	Multimodal Digital Mobility Services
MMTIS	Multimodal Travel Information Services
MS	Member State
NAP	National Access Point
NAPCORE	National Access Point Coordination Organisation for Europe
NB	National Body
RTTI	Real Time Traffic Information
SC, SCOM	Steering Committee
SRTI	Safety Related Traffic Information
SWG	Sub-working Group
TAP TSI	Telematics Application for Passenger Services Technical Specifications for Interoperability
TEN-T	Trans-European Transport Network
TERN	Trans-European Road Network
UVAR	Urban Vehicle Access Regulation
WG	Working Group
WP	Working Programme

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## 1. Introduction

The activities of WG3 'NAP content and accessibility' of the NAPCORE project targets the harmonization of the content of European National Access Points (NAPs) considering, apart from the current and upcoming European legislative framework for the Intelligent Transport Systems (ITS), recorded and foreseen progress in the entire ITS domain. Moreover, the activities of WG3 are envisaged to facilitate the fair, trusted, and enhanced accessibility to ITS-related data across Europe through the investigation of aspects related to data availability (technical and procedural), data quality, data reuse and data visualization. The objectives of WG3 can be summarized as follows:

1. Support Member States (MS) towards a common understanding on the current and future content of NAPs considering existing, planned, and foreseen European legislative and technological developments.
2. Monitor and assess the availability of ITS-related data at both national and Pan-European level.
3. Identify data gaps and provide guidelines to mitigate these gaps.
4. Set a robust framework for and bring into practice the evaluation of the data quality of NAP platforms.
5. Investigate commonly accepted frameworks and technical options to achieve fair, trusted, and enhanced accessibility to ITS-related data through NAPs of Europe.
6. Create added value visualization tools to be used by NAP operators, data providers, and data consumers.
7. Support the enhanced use of NAPs in key application areas of priority and added value for EU MS.
8. Align the achievements on the NAP content and accessibility level with the remaining activities and needs of the project, including training.

The scope of the current report involves and supports the realization of the first and the third objective of WG3. Specifically, it aims to provide an analysis of the current and future policy developments for ITS, identify common points and differences, and develop a list of requirements for NAP operation divided into several thematic areas. Furthermore, building upon the identified requirements that are relevant for NAPs at the current state and the results of the first NAP data availability survey, it aims to identify substantial data availability and other gaps (including accessibility ones) and suggest appropriate mitigation measures. The specific objectives of the current report can be summarized as follows:

- To provide an overview of the current European ITS policy framework emphasizing the role of NAPs as policy enablers/data accessibility mechanisms as well as their required content;
- To provide an overview of new policy developments (including revisions of Delegated Regulations supplementing the ITS Directive);
- To consolidate the findings of the above analysis and identify requirements for NAPs classified based on their topic;
- To compare current requirements with the evidence available from the first and second NAP data availability survey and identify where the main gaps are;

## 2. Methodology and structure

The adopted methodological approach for fulfilling the above objectives is based on a targeted desktop research involving the systematic analysis of official legislative documents published by the European Commission (EC). It is worth mentioning that the current report takes into consideration the outputs of the remaining working groups of the project as well as other activities of the current working group, such as the monitoring of NAPs at European level.

The structure of the document can be summarized as follows. The current chapter describes the adopted methodological approach and the association of the current report with the objectives of the third working group (WG3) of NAPCORE. The third chapter titled 'Overview of ITS policy framework' is associated with the first three objectives of the current document as described in the previous section. In this respect, it provides an overview of the current policy framework and new policy developments for ITS. The same chapter concludes with the identification and presentation of the requirements for the operation of NAPs. The fourth chapter titled 'Gap analysis' is associated with the fourth objective of the current document as described in the previous section. As such, it provides a discussion of the results of the first survey on NAP data availability as well as a comparison with the identified requirements. By that means, it concludes with the extraction of substantial gaps in the content and operation of NAPs across Europe and moves a step further by suggesting some preliminary mitigation measures. The last chapter sums up the main findings of the analyses executed in the context of this report and sets future goals.

### 3. Overview of ITS policy framework

The EU policy framework for ITS has been established by the Directive 2010/40/EU, which sets out a framework to support the coordinated and coherent deployment and use of ITS services and applications within EU, while also providing for the development of the required specifications and standards. More importantly, it distinguishes four priority areas for the development and use of the required specifications and standards:

- Priority Area I: Optimal use of road, traffic, and travel data
- Priority Area II: Continuity of traffic and freight management ITS services
- Priority Area III: ITS road safety and security applications
- Priority Area IV: Linking the vehicle with transport infrastructure

Priority Area I encompass requirements for: a) making multimodal, real-time traffic, and road safety-related information services available across borders to ITS users, b) the collection by relevant public authorities and/or, where relevant, by the private sector of the required road and traffic data (and their provisioning to ITS service providers), and c) making the collected data accurate and available (e.g. through timely updates). Under this priority area, there are three actions that are highly prioritized for the development and use of the required specifications and standards:

- Priority Action A: Provision of EU-wide multimodal travel information services
- Priority Action B: Provision of EU-wide real-time traffic information service
- Priority Action C: Data and procedures for the provision, where possible, of road safety related minimum universal traffic information free of charge to users

Priority Area II encompasses: a) necessary measures for the development of an EU ITS Framework Architecture boosting interoperability and continuity of ITS services and applications, b) specific requirements for the continuity of cross-border ITS services oriented to support the management of either passenger flows across various transport modes or freight flows along transport corridors and across different transport modes, c) necessary measures targeting the realization of logistics-related ITS services (eFreight), and d) the necessary interfaces to achieve interoperability between urban ITS architecture and European ITS architecture.

Priority Area III, on the other hand, encompasses necessary measures for: a) the harmonized provision of an interoperable EU-wide eCall, b) the provision of ITS based information services for safe and secure truck parking places, c) the provision of ITS based reservation services for safe and secure truck parking places, d) supporting the safety of road users with respect to their on-board Human-Machine-Interface (HMI), the use of nomadic devices in support of the driving task and transport operations, and the security of in-vehicle communications, e) the improvement of the safety and comfort of vulnerable road users through ITS applications, and g) the integration of advanced driver support information systems into vehicles and road infrastructure. Under this priority area, there are three actions that are highly prioritized for the development and use of the required specifications and standards:

- Priority Action D: Harmonized provision for an interoperable EU-wide eCall
- Priority Action E: Provision of information services for safe and secure parking places for trucks and commercial vehicles
- Priority Action F: Provision of reservation services for safe and secure parking places for trucks and commercial vehicles.

Finally, Priority Area IV, involves necessary measures for: a) the integration of different ITS applications on an open in-vehicle platform and b) the extension of the achievements in the field of cooperative mobility and C-ITS applications and systems (V2V, I2V, and I2I).

The European Commission (EC) in response to specific of the priority actions mentioned above (i.e., Priority Action A, Priority Action B, Priority Action C, and Priority Action E) has published the following series of Delegated Regulations (DRs) supplementing the ITS Directive (2010/40/EU):

- No. 885/2013 with regard to the provision of information services for safe and secure parking places for trucks and commercial vehicles;
- No. 886/2013 with regard to data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users;
- No. 2015/962 with regard to the provision of EU-wide real-time traffic information services; and
- No. 2017/1926 with regard to the provision of EU-wide multimodal travel information services.

In the entirety of these DRs, explicit reference is made to the so-called NAPs. In particular, in the last two policy documents there is an article dedicated to NAPs, wherein it is stated that each MS shall set up a NAP providing a single point of access to relevant data, thus enabling their exploitation by interested public and private entities. In the remaining two DRs, there is no article dedicated to NAPs; however, it is also mentioned that relevant data shall be accessible through a national (or international) access point. In the last three DRs it is also stated that NAPs can take the form of a repository, registry, web portal, or similar depending on the type of data to which access is provided. The explicit reference to the NAPs and the obligation for each MS to set up a NAP is maintained in the latest DR No. 2022/670, which repeals DR No. 2015/962 with regard to the provision of EU-wide real-time traffic information services. Consequently, NAPs can be addressed as enablers of the current/updated EU ITS policy framework. Accessible databases for both dynamic and static, infrastructure and traffic data derived from relevant public authorities and the private sector are essential to ensure the required standards for optimal ITS use and development. Moreover, the timely update of the provided data, the assurance of a minimum uniform level of data quality and the effective assessment of compliance of all parties involved, are key to the development of useful and reliable ITS services.

A noteworthy similarity among the previously mentioned DRs is that most of their articles are titled by using a common terminology. Therefore, the next subsection analyses the structure of the DRs supplementing the ITS Directive (considering core articles of increased commonality) to pave the ground for the identification of NAP operational requirements. The subsequent sections provide an analysis of the specific content and scope of each DR, paying increased attention to the initial understanding and classification of all involved data categories and any aspects that are less common among all DRs.

### **3.1. Structural analysis of common points in Delegated Regulations supplementing the ITS Directive**

#### **3.1.1. National Access Points**

As already mentioned in the previous subsection, this type of article appears in DR No. 2015/962 and 2017/1926 (as well as in DR No. 2022/670 repealing DR No. 2015/962). Within this type of article, it is stated that each MS shall set up a NAP acting as single interface for the provision of access to road traffic or mode-specific travel data. The entities that may act as data holders and thus data providers are not limited. Contrariwise, several types of public and private entities are mentioned as relevant,

including road/transport authorities, road/transport operators, infrastructure managers, and service providers that are located within the territory of a given MS.

It is also stated that MSs are *free* to choose whether they will provide data for different delegated acts under the ITS Directive by using the *same* or *different* interface (i.e., one NAP or multiple NAPs). This means that it is possible for a MS to utilize a NAP developed for the provision of data for real-time traffic information services to provide data for multimodal travel information services.

Another important aspect mentioned in this type of article is that the data provided through this single interface should be discoverable by interested private and public entities. To make it possible to find, it is suggested that the provided data should be supplemented with the appropriate metadata, enabling data search requests, and listing of retrieved content.

Finally, within this type of article it is stated that two or more MSs can set up and operate a *common* access point, enabling the cross-border continuity of provided data.

### **3.1.2. Data accessibility, exchange, and re-use**

This type of article appears in DR No. 886/2013, 2015/962, and 2017/1926 (as well as in DR No. 2022/670 repealing DR No. 2015/962). The first aspect mentioned in this type of article is that the provided data shall be mutually compatible and interoperable, thus conforming to certain machine-readable formats, standards, and technical specifications. Depending on the type and temporal context (i.e., dynamic versus static) of the data encompassed by each of the aforementioned DRs, the use of different standards and technical specifications is required. For instance, the exchange of static data on road infrastructure and road network regulations and restrictions shall conform to INSIPRE data specification on transport networks, TN-ITS, or DATEX II. Similarly, dynamic safety-related traffic information and dynamic traffic information on the state and real-time use of road networks shall conform to DATEX II. With respect to multimodal travel information, the exchange of multimodal static travel and traffic data shall conform to Network Timetable Exchange (NeTEx) standard (applies for public transport services), Telematics Application for Passenger Services Technical Specifications for Interoperability (TAP TSI) specifications (applies for long-distance rail transport services), International Air Transport Association (IATA) specification (applies for air transport services), or the standards and specifications mentioned previously in relation to road traffic information (applies for road network attributes, roadside/roadway infrastructure, and spatial networks). Finally, the exchange of multimodal dynamic travel and traffic data shall conform to Standard Interface for Real-time Information (SIRI) or DATEX II standard. It is noteworthy that the use of alternative standards and specifications is not precluded provided that (a) the utilized specifications and standards are fully compatible and interoperable with the suggested ones and (b) the utilized specifications and standards are defined through the cooperation of all MSs.

The machine readability of data provided through NAPs has a major implication, regardless of the data standard that is suitable for each data type and temporal data exchange context. This involves their operation as a middleware achieving an uninterrupted data flow from data providers to data consumers. As discussed in the analysis of the previous article, the type of entities that can play the role of data providers is not limited and may encompass several actors involved in the operation and management of transport networks and systems. On the other hand, any party that provides information or other types of services to end users (e.g., road users, travelers) can be considered a data consumer. For this reason, to ensure that end users receive accurate information, the systems of data consumers must remain informed and updated by those of data providers. Moreover, it appears that the targeted users of NAP are not physical entities (persons), but a set of interconnected systems that have as an ultimate goal to provide services to the end users.

In extension to the machine-readability of provided data, this type of article also mentions that data and accompanied metadata shall be provided in a timely manner. The main reason behind this requirement is to ensure that exchanged data will be consumed to provide useful and time valid information to end users.

With the aim of safeguarding the content validity of exchanged data, this type of article also mentions that data consumers shall collaborate with data providers in order to inform them about the existence of any inaccuracies. Such a collaboration can be orientated towards the establishment of a minimum level of quality that is explicitly mentioned in the DR (EU) 670/2022.

Finally, in this type of article it is stated that data and accompanied metadata shall be exchanged through NAPs without any bias or preference towards certain users or group of users that fulfill the same conditions. This requirement is further specialized in DR (EU) 1926/2017 mentioning that APIs providing access to mobility data (that may relate collective modes of transport) shall be publicly accessible allowing users and end-users to register to obtain access.

### **3.1.3. Data updates**

This type of article appears in 2015/962 (as well as in DR No. 2022/670 repealing DR No. 2015/962) and in 2017/1926. A common point in all articles is that any data update shall be made available in a timely and regular manner. Regularly updated static and dynamic road/travel/traffic data or even combinations of them shall constitute the basis for the provision of accurate real-time traffic and traveler information services. On top of that, any inaccuracies detected in the exchanged data by road/transport authorities, road/transport operators, and other types of service providers (or even by any user or end-user) shall be reported and rectified within a reasonable timeframe.

The updates of static data shall be accompanied by a minimum set of information. The first element in this set is the type of updated data. Different types of data may require different update frequencies. For instance, data regarding the infrastructure of road network (e.g., geometry, number of lanes) may not undergo frequent changes, whereas, on the other hand, data regarding regulations and restrictions (e.g., speed limits, traffic circulation plans) may need more frequent updates. The second element is the location of the condition concerned by the update. For instance, if a condition of a traffic circulation plan limits the access to specific parts of a road network and a change occurs in the location of this condition (e.g., modification of the applicable road network part), this change shall be reflected in the data update. The third element is the type of update, i.e., modification, deletion, or insertion of provided information. A typical example constitutes the deletion of an entry of a data resource reflecting the elimination of a parking place. The fourth element is the description of the update that may enclose useful information detailing the reason behind the data update, its period of occurrence as well as the conditions imposed (e.g., vehicle classes). The fifth element is the date on which the data has been updated. This provides useful insight into the validity of exchanged information and may also trigger the need for a data update when the last update was made a long time ago. The sixth element is the date and time when the change in a given condition has occurred or is planned to occur. The last element is the quality of data update, including indications about the accuracy and reliability of the data resource that has been updated.

The updates of dynamic data shall also be accompanied by a minimum set of information. The first element in this set is, again, the type of updated data and when needed a short description or clarification of it. The second element involves the location of the event or condition concerned by the update. This is of particular importance when exchanging dynamic information, considering that the applicable location of a condition or event (e.g., poor road conditions) may drastically change from time to time. The third element is the period of occurrence of the event or condition concerned by the update. This is also of particular importance, given that the provision of information about an event



or condition without the required details for assisting the assessment of its time validity is of very little use. The last element is, again, the quality of data update, including indications about the accuracy and reliability of provided information.

This type of article also indicates (for either static or dynamic data) that standardized or other generally accepted dynamic location referencing methods shall be utilized to ensure the unambiguous decoding and interpretation of the location of events or conditions. Furthermore, in this type of article it is stated that any type of data provider shall modify accordingly or withdraw real-time information, when the status of a transport infrastructure or service has changed. Finally, it is stated that digital map producers and service providers have the responsibility to process these updates in a timely manner, allowing end-users to access the information without any unnecessary delay.

#### **3.1.4. Assessment of compliance**

This type of article appears in all Delegated Regulations supplementing the ITS Directive. It requests from Member States to ensure that data holders and data users comply to the requirements set out by these Delegated Regulations. To achieve that, the competent authorities of Member States may request from data holders or data users a description of the provided data or services (including information about their quality and conditions of re-use) as well as an evidence-based declaration of compliance. Finally, these competent authorities (in certain Delegated Regulations termed as “National Bodies”) shall randomly check whether the provided declarations are correct. According to DR No. 885/2013 and 886/2013, National bodies shall provide reports to national authorities in an annual basis, regarding the submitted declarations and the outcomes of their random inspections.

Moreover, according to DR No. 885/2013 and 886/2013, these declarations shall include the following elements:

*In DR No. 885/2013:*

- The type of information provided regarding safe and secure truck parking places including the percentage of parking places covered in the information service;
- The means used to disseminate/distribute this information to end users;
- The safe and secure truck parking places for which dynamic information services are provided;
- Indications of the quality and availability of the provided information;
- The access point and the format through/in which the information is provided

*In DR No. 886/2013:*

- The type of road safety related categories covered;
- The extent of road network covered;
- The access point and the format through/in which the information is provided;
- The means used to disseminate/distribute this information to end users;
- The conditions of using the provided information

### **3.2. Scope and analysis of DR (EU) 885/2013 - Provision of information services for safe and secure parking places for trucks and commercial vehicles**

DR (EU) 885/2013 aims to guarantee the seamless and reliable provision of information services for safe and secure parking places for trucks and commercial vehicles. Data, derived by public or private parking services and supplied in DATEX II or any other compatible machine-readable format, can be both static and dynamic. The static data refers to parking areas themselves and may also cover aspects of safety, security and parking area equipment, while the dynamic data refer to the real-time availability of safe and secure parking places. In Article 3 it is stated that each MS shall designate



specific areas, where traffic and security conditions require the deployment of information services on the safe and secure parking places. Therefore, there is no explicit reference which are the areas that shall be covered by the information service. However, according to Article 1 these areas shall be located on the trans-European road network (TERN). Moreover, in Article 3 it is stated that each MS shall also define the so-called “priority zones”, where dynamic information needs to be provided. The data categories that fall into the scope of the current DR are outlined in Table 1.

Table 1: Categories and elements of data exchanged in relation to DR (EU) 885/2013

Temporal data exchange context	Data categories	Data elements/ontologies included in each category
Static	Information about safe & secure truck parking areas	Identification information of parking area (name and address of the truck parking area)
		Location information of the entry point in the parking area (latitude/longitude)
		Primary road identifier1/direction and Primary Road identifier2/direction if same parking accessible from two different roads
		Indication of the Exit to be taken/Distance from primary road km or miles
		Total number of free parking places for trucks
		Price and currency of parking places
	Information about the safety & equipment of truck parking areas	Description of security, safety and service equipment of the parking including national classification if one is applied
		Number of parking places for refrigerated goods vehicles
		Information on specific equipment or services for specific goods vehicles and other
		Contact information of the parking operator (Name and surname, Telephone number, E-mail address, Consent of the operator to make his/her contact information public)
Dynamic	Information about the status of safe & secure truck parking areas and availability of parking spaces	Status (open, full, closed) and number of free spaces

MSs are required to provide the data referred to in Table 1 through either a *national* or *international* access point, although this specific DR does not outline detailed requirements for NAPs. In Article 5 it is stated that private and public parking operators and/or service providers shall make (static) information about safe & secure truck parking areas accessible for exchange and re-use by any other public or private information service provider and/or parking operator on a non-discriminatory basis, and in accordance with access rights and procedures defined in Directive 2003/98/EC. Moreover, charges for gaining access to, exchanging, re-using dynamic information shall be reasonable in line with the PSI Directive (2013/37/EU). In Article 5 it is also stated that public and private parking operators and/or service providers shall periodically send the data that they collect to utilized access point with



a frequency no less than once a year. Dynamic information, on the other hand, shall be updated no less than once every 15 minutes.

In terms of quality control, Article 7 mentions that any change of the situation of a parking area (including its closure) shall be reflected in the information provided through the utilized access point. As regards dynamic information, public and private operators and/or service providers are requested to carry out periodical controls of the detection equipment, including measuring of the difference between the data displayed and the real availability of parking places.

In Article 9 it is stated that MSs at the latest 12 months following the entry into force of the current DR (4 June 2013) and every calendar year afterwards shall report to EC the following: (a) the number of different parking places and parking spaces on their territory, (b) the percentage of parking places for which at least static information is provided, and (c) the percentage of parking places for which dynamic information is provided as well.

Finally, in Article 10 it is stated that DR (EU) 885/2013 shall apply from 1 October 2015 to the provision of services already deployed on the date of entry into force of this Regulation (4 June 2013) as well as from 1 October 2013 to the provision of services to be deployed after the date of entry into force of this Regulation (4 June 2013).

### 3.3. Scope and analysis of DR (EU) 886/2013 - Provision of road safety-related minimum universal traffic information free of charge to users

DR (EU) 886/2013 focuses on the provision of road safety related minimum universal traffic information. This information shall describe the location and category of events and conditions affecting road safety conditions as well as any provided driving behaviour advice. The detection of events and conditions is required to comply with national laws, while the relevant information shall be provided, if possible free of charge, in DATEX II or any other compatible machine-readable format. The current DR does not encompass the provision of static information, given the dynamic nature of events and conditions affecting road safety. It aims to enable the provision of road safety-related real-time traffic information services to road users and, by that means, reduce the number of accidents caused by unexpected or dangerous situations on the road. Table 2 provides an overview of the data exchanged in relation to DR (EU) 886/2013.

Table 2: Categories and elements of data exchanged in relation to DR (EU) 886/2013

Temporal data exchange context	Data categories	Data elements/ontologies included in each category
Dynamic	Information about road safety-related events/conditions	Location of event/condition
		Category of event/condition <ul style="list-style-type: none"> <li>• temporary slippery road;</li> <li>• animal, people, obstacles, debris on the road;</li> <li>• unprotected accident area;</li> <li>• short-term road works;</li> <li>• reduced visibility;</li> <li>• wrong-way driver;</li> <li>• unmanaged blockage of a road;</li> <li>• exceptional weather conditions.</li> </ul>
		Driving behaviour advice (where appropriate)

According to Article 1, MSs are required to provide the data referred to in Table 2 on the trans-European (TEN-T) road network, without distinction between the core and comprehensive parts. In relation to that, Article 5 clarifies that Member States shall identify and designate the specific sections of the trans-European road network along which the data referred to in Table 2 should be collected and made available, in order to enable the deployment of the relevant end-user services. This requirement implies that Member States need to assess the traffic and safety conditions of the different sections of the trans-European road network and determine where the deployment of these services is most necessary. It is also mentioned that each Member State shall provide the European Commission with a list of the specific sections of the trans-European road network where the road safety-related minimum universal traffic information services are required. The overall orientation of the current DR to the TEN-T road network (or at least designated safety-critical parts of it) can be addressed as a means of ensuring that European travelers enjoy seamless (cross-border) road safety-related traffic information services.

In Article 6, it is mentioned that public and private road operators and/or service providers shall set up or use the appropriate means to detect events or identify conditions and shall collect the relevant road safety-related traffic data.

On top of that, Article 7 mentions that both public and private road operators shall share and make available for exchange and re-use the data that they collect on a non-discriminatory basis, within the Union irrespective of the Member State of establishment, in line with Directive 2003/98/EC, through the NAP, and within a timeframe that ensures the timely provision of the information service. The last condition reveals a significant dimension of the data exchanged in relation to the current DR. This involves its timeliness, given that the late provision of information about unexpected or dangerous situations on the road is not expected to positively impact road safety conditions. In contrast to DR (EU) 885/2013, no explicit reference is made on what exactly constitutes a timely provision of the information service<sup>1</sup>.

Furthermore, in the same article it is noted that MSs shall establish a NAP for providing access to the data collected by public and/or private road operators and/or service providers. Its purpose is to create a unified and standardized way for accessing the data collected by different road operators and/or service providers, regroup any operated private single access points, reduce duplication of effort, and promote more efficient use of resources.

In Article 9 it is mentioned that each MS shall inform EC about the impartial and independent party designated to act as a national body, the role of which is to assess whether the requirements mentioned in the current DR are complied with public and private road operators and service providers and broadcasters dedicated to traffic information. This assessment shall be made on the basis of the random inspection of the correctness of the self-declaration forms submitted by the aforementioned actors. These forms shall contain the following elements: (a) the road safety-related categories covered and the road network coverage of the information service, (b) information on their access point to road safety-related traffic data and its conditions of use, (c) the format of the road safety-related traffic data accessible through their access point and (d) the means of dissemination of the information service to end users.

In Article 10 it is stated that MSs at the latest 12 months following the entry into force of the current DR (4 June 2013) and every calendar year afterwards shall report to EC the following: (a) the progress made in the implementation of the information service (including criteria and means adopted for

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<sup>1</sup> In DR (EU) 885/2013, it is stated that dynamic information about the status and space availability of safe and secure truck parking areas should be refreshed no less than once every 15 minutes.



defining and monitoring its quality), (b) the results of the assessment of compliance, and (c) where relevant, a description of changes made to the NAP.

Finally, in Article 11 it is stated that DR (EU) 886/2013 shall apply from 1 October 2013. However, with regard to the information service already deployed on the date of entry into force of this Regulation, it shall apply from 1 October 2015.

### 3.4. Scope and analysis of DR (EU) 2015/962 - Provision of EU-wide real-time traffic information services

DR (EU) 2015/962 refers to the provision of EU-wide real-time traffic information (RTTI) services. This DR explicitly states the requirement for the setup of NAPs by each MS (in compliance with the ITS Directive), in which public authorities and private operators will provide and regularly update road traffic data accompanied by the appropriate metadata. According to this DR, specific requirements shall be met to guarantee that road and traffic data can be easily accessed, shared, reused and updated by road authorities, road operators and service providers. This will facilitate the provision of real-time traffic information services across the EU. To achieve a consistent and seamless provision of real-time traffic information services, Member States should utilize existing standards provided by European and international standardisation organisations, including DATEX II and ISO standards, or other compatible machine-readable formats. However, in cases where there is no standardised format available for certain data types, Member States and relevant stakeholders should collaborate to establish commonly agreed definitions, formats, and metadata. Table 3 provides an overview of data categories exchanged in relation to DR (EU) 2015/962.

Table 3: Categories and elements of data exchanged in relation to DR (EU) 2015/962

Temporal data exchange context	Data categories	Data elements/ontologies included in each category
Static	Information about the road network	Road network links and their physical attributes (geometry, road width, number of lanes, gradients, junctions)
		Road classification
		Speed limits
		Identification of tolled roads, applicable fixed road user charges and available payment methods
	Information about the usage of the road network	Traffic circulation plans
		Freight delivery regulations
		Traffic signs reflecting traffic regulations and identifying dangers: <ul style="list-style-type: none"> <li>• access conditions for tunnels</li> <li>• access conditions for bridges</li> <li>• permanent access restrictions</li> <li>• other traffic regulations</li> </ul>
	Information about roadway and roadside infrastructure	Location of tolling stations
		Location of parking places and service areas
Location of charging points for electric vehicles and the conditions for their use		
Location of compressed natural gas, liquefied natural gas, liquefied petroleum gas stations		

		Location of public transport stops and interchange points	
		Location of delivery areas	
Dynamic	Road status information	Road closures	
		Lane closures	
		Bridge closures	
		Overtaking bans on heavy goods vehicles	
		Roadworks	
		Accidents and incidents	
		Dynamic speed limits	
		Direction of travel on reversible lanes	
		Poor road conditions	
		Temporary traffic management measures	
		Variable road user charges and available payment methods	
		Availability of parking places	
		Availability of delivery areas	
		Cost of parking	
		Availability of charging points for electric vehicles	
	Weather conditions		
		Traffic information	Traffic volume
			Speed
			Location and length of traffic queues
			Travel times
	Waiting time at border crossings to non-EU Member States		

In line with DR (EU) 886/2013, MSs are required to provide the data referred to in Table 2 on the trans-European (TEN-T) road network, without distinction between the core and comprehensive parts. In addition, in Article 1 it is stated that the aforementioned data shall be provided along motorways not included in the TEN-T as well as in priority zones identified by national authorities as highly relevant. Priority zones are defined as road sections identified by national authorities where they consider this to be relevant, in particular in urban areas, that are not part of the comprehensive TEN-T road network and not motorways, based on the levels of recurring traffic congestion or other traffic management considerations.

In Article 3, it is stated that each MS shall set up a NAP providing access to data referred to in Table 2. It is also stated that NAPs developed in the context of either DR (EU) 885/2013 or DR (EU) 886/2015 can be reused. These NAP shall necessarily provide data discovery services to end, i.e., shall contain the necessary metadata and support metadata querying functions. Interestingly, in the same article it is stated that two or more MSs can set up a common access point. The explicit reference to this possibility highlights the importance of the cross-border continuity of real-time traffic information services.

In Article 4, it is stated that road authorities and road operators shall provide the static data they collect in a standardized or any other machine-readable format. However, no reference is made on specific data standards. In the same article, it is stated that static data shall be accessible for exchange and re-use by any service provider or digital map producer (a) on a non-discriminatory basis, (b) through the NAP or utilized common access point, and (c) within a timeframe that hat ensures the timely provision of the real-time traffic information services. The last condition stresses the need to provide timely and



time valid information services to road users. In contrast to DR (EU) 885/2013 and in line with DR (EU) 886/2013, no explicit reference is made on what exactly constitutes a timely provision of the information service<sup>2</sup>.

Moreover, in Article 4 it is stated that any party wishing to use the provided static data shall take, to the extent possible, any traffic circulation plans. Through this requirement, it is implied that the usage of the road network is regulated by certain competent authorities. Similar requirements are imposed by Articles 5 and 6 with respect to the provision of access, exchange, and re-use of dynamic road status and dynamic traffic information. The most notable difference is the explicit reference to DATEX II.

Articles 8, 9, and 10 provide general guidelines on how data updates shall be executed, including their content. These guidelines are outlined in Section 3.1. Moreover, these articles impose the use of standardized location referencing methods. Article 11 sets the framework for assessing the compliance of road authorities, road operators, digital map producers and service providers to the requirements set by the current DR. More details can be found in Section 3.1.

In Article 12, it is stated that MSs at the latest by 13 July 2018 and every two calendar years thereafter shall submit to EC a report summarizing (a) the progress made towards the implementation of the current DR, (b) the geographical coverage of the information service, (c) criteria and means adopted for defining and monitoring its quality, (d) the results of compliance assessments, (e) if needed a description of changes to the operation and modalities of the utilized NAP or common access point, as well as (g) if needed a description of changes to the priority zones.

Finally, in Article it is stated that the current DR enters into force on 7 January 2015 and applies from 13 July 2017.

### **3.5. Scope and analysis of DR (EU) 2022/670 - Provision of EU-wide real-time traffic information services**

DR (EU) 2022/670 constitutes an updated version of DR (EU) 2015/962 establishing the required specification 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 (as well as that these services are accurate and available across borders to end-users). This DR extends the geographical scope of RTTI data and services by requiring real-time traffic information to be available along the entire road network that is publicly accessible to motorized traffic, including private roads (i.e., assigned to private entities through a management concession) provided that these roads are part of the TEN-T network or “primary” roads. Primary roads are defined as roads outside urban areas that connect major cities or regions, or both, not classified as parts of the comprehensive trans-European road network or as motorways. Each member state had to indicate what they consider to be the primary network before January 1<sup>st</sup> of this year. The aforementioned definition of primary roads does not strictly specify which cities or regions shall be addressed as major ones, thus leaving space for different interpretations across Europe.

Furthermore, it should be noted that the functional scope of the current DR is to a great extent the same as its previous version. A major difference comes from the different categorization of the encompassed data categories, which are now classified as follows: (a) infrastructure data, (b) data on regulations and restrictions (distinguished into crucial and other data types), (c) data on the state of the network (distinguished into crucial and other data types), and (d) data on the real-time use of the network. Another major difference is the addition of certain data categories that were not explicitly

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<sup>2</sup> In DR (EU) 885/2013, it is stated that dynamic information about the status and space availability of safe and secure truck parking areas should be refreshed no less than once every 15 minutes.



mentioned in DR (EU) 2015/962 or were not broken down in the same manner. These data categories are summarized in Table 4. A last major difference is that specific RTTI data elements are now characterized as “crucial” highlighting their significance for the reliability of provided RTTI services. These data elements are summarized in Table 5.

Table 4: Additional elements of data exchanged in relation to DR No 2022/670 (that did not exist in DR No 2015/962)

Temporal data exchange context	Data categories	Data elements/ontologies included in each category
Static or dynamic	Data on regulations and restrictions	Static and dynamic traffic regulations: weight/length/width/height restrictions; one-way streets; boundaries of restrictions, prohibitions or obligations with zonal validity, current access status and conditions for circulation in regulated traffic zones
	Infrastructure data	Location of refuelling points and stations for all other fuel types
Dynamic	Data on the state of the network	Availability of refuelling points and stations for alternative fuel types
		Price of ad hoc recharging/refuelling

Table 5: Elements of data exchanged in relation to DR No 2022/670 that are characterised as “crucial”.

Temporal data exchange context	Data categories	Data elements/ontologies included in each category
Static or dynamic	Data on regulations and restrictions	Static and dynamic traffic regulations: access conditions for tunnels; access conditions for bridges; permanent access restrictions; speed limits; freight delivery regulations; overtaking bans on heavy goods vehicles; weight/length/width/height restrictions; one-way streets; boundaries of restrictions, prohibitions or obligations with zonal validity, current access status and conditions for circulation in regulated traffic zones; direction of travel on reversible lanes
	Infrastructure data	Traffic circulation plans Location of refuelling points and stations for all other fuel types
Dynamic	Data on the state of the network	Road closures
		Lane closures
		Roadworks
		Temporary traffic management measures

In Article 13, it is stated that MSs shall submit to the EC, no later than 1st January 2023, a list and map representation of the primary road network. In addition to that, MSs shall report to the EC: (a) the progress made in terms of the accessibility, exchange, and re-use of the data types, (b) the extent of

the geographic coverage of data available through the National Access Point, modifications made to the primary road network, and to the content of real-time traffic information services. This also includes the quality of the data, including the criteria used to define this quality, as well as the methods used to monitor these changes.

Moreover, the current DR extends the data standards that shall be followed by MSs when making available RTTI data and information. Specifically, the following standards are explicitly mentioned:

- For infrastructure data: INSPIRE data specification on transport networks, TN-ITS (CEN/TS17268 and subsequently upgraded versions) or DATEX II (EN 16157, CEN/TS 16157 and subsequently upgraded versions).
- For data on regulation and restrictions: DATEX II (EN 16157, CEN/TS 16157 and subsequently upgraded versions) or TN-ITS (CEN/TS 17268 and subsequently upgraded versions).
- For data on the state of the network: DATEX II (EN 16157, CEN/TS 16157 and subsequently upgraded versions).
- For data on the real-time use of the network: DATEX II (EN 16157, CEN/TS 16157 and subsequently upgraded versions).

While the previous DR mentioned that MSs can select a fully compatible and interoperable format with the standards that were explicitly mentioned, the same does not happen in the current DR.

The current DR repeals DR (EU) 2015/962 from 1 January 2025. It is also stated that obligations related to data elements that are not included in Table 5 (i.e., non-crucial data elements) shall not apply until a transitional period ending on 31 December 2027 with respect to roads other than the following:

- Comprehensive TEN-T road network (including Core parts)
- Other motorways not included in the Comprehensive TEN-T road network
- Primary roads

### **3.6. Scope and analysis of DR (EU) 2017/1926 - Provision of EU-wide multimodal travel information services**

DR (EU) 2017/1926 provides specifications to ensure that EU-wide multimodal travel information services (MMTIS) are accurate and available across borders to ITS users. DR (EU) 2017/1926 mandates that a series of multimodal travel and traffic data, along with regular updates and historical records, be published in a standardized form on a NAP. On the other hand, it is at the discretion of the MSs to decide whether they wish to publish dynamic multimodal travel and traffic data through NAPs. Static data concern useful insights about location search, trip plans and auxiliary information, information for trip plan computation, traveller services and special fare queries. On the other hand, dynamic data concern passing times, trip planning, operational information and the availability of mobility services and relevant infrastructure. The specifications set out in this DR encompass several transport modes operated in the Union, such as:

- Schedule based modes: air, rail including high speed rail, conventional rail and light rail, long-distance coach, maritime including ferry, metro, tram, bus, trolley-bus, cableways
- On demand (DRT) modes: shuttle bus, shuttle ferry, taxi, ride-share, car-share, car-pool, car-hire, bike-share, bike-hire, dial-a-ride
- Personal modes: car, motorcycle, bicycle, and walking as a travel option especially for first and last mile of the journey

The current DR includes requirements for both data and service provision. The data should be provided based on existing EU standards and technical specifications based on the data category (for example

for road data, DATEX II, for spatial data, INSPIRE, for rail data, TAP TSI). For static scheduled data (such as public transport, long distance coach and maritime including ferry), the relevant data in the NAP should use the CEN data exchange standard NeTEx CEN/TS 16614 based on the underlying conceptual data reference model (Transmodel). For dynamic public transport data, the NAP should use the relevant parts of the CEN data exchange standard SIRI CEN/TS 15531, and duplication of the same travel and subsequent upgraded versions or any machine-readable format fully compatible should be used. Duplications of travel and traffic data in more than one format should be avoided. Data such as routing results can also be provided to other information service providers, upon request. The static travel and traffic data described within DR (EU) 2017/1926 was scheduled to be provided by MSs from December 2019 till December 2021 (depending on the type of the data) for the trans-European Transport network (TEN-T), and for other parts of the road network till December 2023. Regarding the compliance assessment, as was the case in DR (EU) 2015/962, data and quality descriptions as well as an evidence-based declaration of compliance with the requirements may be requested from transport operators and travel information service providers. Table 6 provides an overview of data categories that fall into the functional scope of DR (EU) 2017/1926.

Table 6: Categories and elements of data exchanged in relation to DR No 2017/1926

Temporal data exchange context	Data categories	Data elements/ontologies included in each category
Static	Information for location search	Address identifiers (building number, street name, postcode)
		Topographic places (city, town, village, suburb, administrative unit)
		Points of interest (related to transport information) to which people may wish to travel
		Identified access nodes (all scheduled modes)
		Geometry/map layout structure of access nodes (all scheduled modes)
		Park & Ride stops
		Bike sharing stations
		Car-sharing stations
		Publicly accessible refuelling stations for petrol, diesel, CNG/LNG, hydrogen powered vehicles, charging stations for electric vehicles
		Secure bike parking (such as locked bike garages)
	Trip plan and auxiliary information	Operational Calendar, mapping day types to calendar dates
		Basic common standard fares (all scheduled modes) -Fare network data (fare zones/stops and fare stages) -Standard fare structures (point to point including daily and weekly fares, zonal fares, flat fares)
		Vehicle facilities such as classes of carriage, on-board Wi-Fi
	Information for trip plan computation	Connection links where interchanges may be made, default transfer times between modes at interchanges
		Network topology and routes/lines (topology)
Transport operators		
Timetables		
		Planned interchanges between guaranteed scheduled services



		Hours of operation
		Stop facilities access nodes (including platform information, help desks/information points, ticket booths, lifts/stairs, entrances and exit locations)
		Vehicles (low floor; wheelchair accessible)
		Accessibility of access nodes, and paths within an interchange (such as existence of lifts, escalators)
		Existence of assistance services (such as existence of on-site assistance)
		Detailed cycle network attributes (surface quality, side-by-side cycling, shared surface, on/off road, scenic route, 'walk only', turn or access restrictions (e.g., against flow of traffic))
		Parameters needed to calculate an environmental factor such as carbon per vehicle type or passenger mile or per distance walked
		Parameters such as fuel consumption needed to calculate cost
		Road network
		Cycle network (segregated cycle lanes, on-road shared with vehicles, on-path shared with pedestrians)
		Pedestrian network and accessibility facilities
		Estimated travel times by day type and time-band by transport mode/combination of transport modes
	Traveller services	Where and how to buy tickets for scheduled modes, demand responsive modes and car parking (all scheduled modes and demand-responsive incl. retail channels, fulfilment methods, payment methods)
		How to pay tolls (incl. retail channels, fulfilment methods, payment methods)
		How to book car sharing, taxis, cycle hire etc. (incl. retail channels, fulfilment methods, payment methods)
		Where and how to pay for car parking, public charging stations for electric vehicles and refuelling points for CNG/LNG, hydrogen, petrol- and diesel-powered vehicles (incl. retail channels, fulfilment methods, payment methods)
	Information for detailed common standard and special fare queries	Passenger classes (classes of user such as adult, child, student, veteran, impaired access and qualifying conditions and classes of travel such as 1st, 2nd)
		Common fare products (access rights such as zone/point-to-point including daily and weekly tickets/single/return, eligibility of access, basic usage conditions such as validity period/operator/time of travel/interchanging, standard point to point fares prices for different point to point pairs including daily and weekly fares/zonal fare prices/flat fare prices)
		Special Fare Products: offers with additional special conditions such as promotional fares, group fares, season passes, aggregated products combining different products

		and add on products such as parking and travel, minimum stay
		Basic commercial conditions such as refunding/replacing/exchanging/transferring and basic booking conditions such as purchase windows, validity periods, routing restrictions zonal sequence fares, minimum stay
Dynamic	Passing time, trip plan, and operational information	Disruptions (all modes)
		Real-time status information — delays, cancellations, guaranteed connections monitoring (all modes)
		Status of access node features (including dynamic platform information, operational lifts/escalators, closed entrances and exit locations — all scheduled modes)
		Estimated departure and arrival times of services
		Current road link travel times
		Cycling network closures/diversions
		Future predicted road link travel times
	Availability of services and relevant infrastructure	Availability of publicly accessible charging stations for electric vehicles and refuelling points for CNG/LNG, hydrogen, petrol- and diesel-powered vehicles
		Car-sharing availability, bike sharing availability
		Car parking spaces available (on and off-street), parking tariffs, road toll tariffs

Furthermore, in Article 4 and 5 of the current DR it is stated for the first time (considering all DRs) that both static and dynamic travel and traffic data shall be represented through minimum national profiles determined by Member States. In relation to that, in the introduction of the current DR it is mentioned that in order to ensure the optimal use and full interoperability of the standards used to provide travel and traffic data, these national profiles must be based on a common minimum European profile when it exists.

Two policy measures are under consideration for the revision by the EC of the current DR.

1. To expand the data sets, both for static and dynamic data types defined in its Annex
2. To mandate the publication of specified dynamic data sets related, inter alia, to the passenger rights regulations.

The measures are expected to help increasing the coverage and accessibility of services and the utility and effectiveness of Multimodal Digital Mobility Services (MDMS). In particular, the main objectives of the revision are to (a) further facilitate the exchange and re-use of data needed for the development of MMTIS and provide an incentive for real-time data sharing and accessibility of new data types and (b) address standardisation issues for MDMS. In this context, the revision also aims to solve issues regarding the fragmentation and lack of harmonised data for the dynamic data between DRs<sup>3</sup>.

Considering these two main objectives, the revision will focus on further enhancing the development of information services and on the following technical aspects:

<sup>3</sup> The Impact assessment and Cost Benefit Analysis study for MMTIS and MDMS is currently under development and will be delivered end of 2022.

- Making mandatory the accessibility of currently optional dynamic data already listed in the Annex of DR (EU) 2017/1926.
- Updating the list of data to be made accessible (including new data types) pursuant to DR (EU) 2017/1926; New data types that are currently under discussion are vehicle occupancy and the precise historical data (for example to review public transport delays etc.). More data types are also likely to be proposed.
- Requiring the use of certain standards for payment and booking interfaces (e.g., TOMP API and its interfaces with Transmodel).
- Ensuring alignment with data categories of RTTI (parking / refuelling and recharging / tolling). For example, Information Service-related data types (like availability of publicly accessible charging stations for electric vehicles and refuelling points) will be/are covered by the updated RTTI. Moreover, to solve any ambiguity regarding disruptions related data, which overlap at some extent with road disruption and the relevant DR, MMTIS DR will focus on demand responsive transport and the data needed. Results of NAPCORE working groups on parking data harmonisation work will also be taken into account.

### 3.7. Requirements gathering

The brief overview of the ITS policy framework offered in the previous sections, reveal that there are several requirements for the operation of NAPs and NAP ecosystem. These requirements can be classified per DR as well as per various thematic areas, such as:

- Transport modes covered;
- Functional scope of data that needs to be collected and provided;
- Provision of metadata;
- Data quality;
- Geographical or network coverage;
- Utilized formats and standards;
- Harmonized data standard profiles;
- Terms and conditions for data access, exchange, and re-use;
- NAP type and operational architecture;
- Actors involved in data collection and provision chains;
- Collaboration between data providers and users;
- Timeframe of data provision; and
- Reporting to EC

Beyond the above, there are thematic areas of “revolving compliance assessment” “dissemination of information to end-users” that are not further analysed in the current document, since they fall either under the responsibility of National Bodies (or other competent authorities) of each MS or ITS service providers. Table 7 provides a summary of the requirements as collected and classified per the above-mentioned thematic areas.

Table 7: Summary of requirements derived from Delegated Regulations supplementing the ITS Directive

Thematic area	Requirements per Delegated Regulation				
	DR (EU) 885/2013	DR (EU) 886/2013	DR (EU) 2015/962	DR (EU) 2022/670	DR (EU) 2017/1926
<b>Transport modes covered</b>	Trucks and commercial vehicles	All modes using road network of concern	All modes using road network of concern	All modes using road network of concern	All schedule-based (air, rail, maritime, bus etc.), transport on demand (car-share, car-pool), and personal mobility modes (car, motorcycle, bicycle etc.)
<b>Functional scope of data that need to be collected and provided</b>	<ul style="list-style-type: none"> <li>- Static data on parking areas for trucks and commercial vehicles</li> <li>- Static data on safety conditions and equipment of parking areas</li> <li>- Dynamic data on availability of parking places</li> </ul>	<ul style="list-style-type: none"> <li>- Dynamic data for the provision of road safety-related traffic information services</li> </ul>	<ul style="list-style-type: none"> <li>- Static road network data</li> <li>- Static data on the usage of the road network</li> <li>- Static data on roadway/roadside infrastructure</li> <li>- Dynamic data on road status</li> <li>- Dynamic data on traffic conditions</li> </ul>	<ul style="list-style-type: none"> <li>- Static data on road infrastructure</li> <li>- Static data on regulations and restrictions</li> <li>- Dynamic data on the state of the network</li> <li>- Dynamic data on the real-time use of the network</li> </ul>	<ul style="list-style-type: none"> <li>- Static data for location search</li> <li>- Static data on trip plans and auxiliary information</li> <li>- Static data for trip plan computation</li> <li>- Static data on traveller services</li> <li>- Static data on detailed common standard and special fare queries</li> <li>- Dynamic data on passing times, trip plans, and operational information</li> <li>- Dynamic data on availability of services and relevant infrastructure</li> </ul>
<b>Provision of metadata</b>	No explicit reference to metadata	No explicit reference to metadata	Metadata and discovery services shall be provided through the NAP for all data categories	Metadata and discovery services shall be provided through the NAP for all data categories	<ul style="list-style-type: none"> <li>- Metadata and discovery services shall be provided for those data made available through the NAP.</li> <li>- Necessary to properly describe the content and structure of the relevant travel and traffic data by using the appropriate metadata according to EU EIP SPA Coordinated Metadata Catalogue.</li> </ul>
<b>Data quality</b>	<ul style="list-style-type: none"> <li>- Static data shall be updated no less than once a year.</li> </ul>	<ul style="list-style-type: none"> <li>- Dynamic data shall be made available within a timeframe</li> </ul>	<ul style="list-style-type: none"> <li>- Articles 8, 9, and 10 provide general</li> </ul>	<ul style="list-style-type: none"> <li>- Articles 4, 5, 6, 7, and 8 provide general guidelines on</li> </ul>	<ul style="list-style-type: none"> <li>- Travel information services shall be based on updates of</li> </ul>

Thematic area	Requirements per Delegated Regulation				
	DR (EU) 885/2013	DR (EU) 886/2013	DR (EU) 2015/962	DR (EU) 2022/670	DR (EU) 2017/1926
	<ul style="list-style-type: none"> <li>- Dynamic data shall be updated no less than once every 15 minutes.</li> <li>- Any change of situation of the parking area, including its closure, shall be immediately notified by public and private parking operators.</li> <li>- Periodical controls of the detection equipment shall be carried out.</li> </ul>	<p>that ensures the timely provision of the safety-related traffic information service.</p> <ul style="list-style-type: none"> <li>- Public and private road operators and service providers shall ensure the timely renewal and quality of data made available through their access point.</li> <li>- Member States should work further and share their experiences on the definition of the relevant quality criteria, the methods of quality measurement and monitoring, and the quality targets for every type of road safety-related events or conditions, road networks and/or operating environments.</li> </ul>	<p>guidelines on how data updates shall be executed.</p> <ul style="list-style-type: none"> <li>- Road authorities and road operators shall ensure the timely update of static road data and dynamic road status and, where known and possible, provide these updates to users in advance.</li> <li>- 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 [...]</li> </ul>	<p>how data updates shall be executed.</p> <ul style="list-style-type: none"> <li>- Articles 4, 5, 6, 7, and 8 mention that MSs shall agree upon a set of appropriate quality requirements in cooperation with relevant stakeholders.</li> <li>- 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 [...]</li> </ul>	<p>static and dynamic travel and traffic data.</p> <ul style="list-style-type: none"> <li>- Information on the quality of data is required; however, there is no specific reference to quality criteria and how these shall be defined.</li> </ul>
<b>Geographical or network coverage</b>	<ul style="list-style-type: none"> <li>- Geographical and network coverage is not strictly defined; however, the parking areas for which information is provided shall be situated on TEN-T road network.</li> <li>- Dynamic information shall be provided for parking areas</li> </ul>	<ul style="list-style-type: none"> <li>- The requirements of this Regulation should not apply to urban nodes.</li> <li>- Member States should be able to delineate the coverage of the road safety-related minimum universal traffic information service along the TEN-T road</li> </ul>	<ul style="list-style-type: none"> <li>- It shall apply to the comprehensive parts of the TEN-T road network, as well as motorways not included in this network, and priority zones<sup>4</sup> identified by national authorities where they</li> </ul>	<ul style="list-style-type: none"> <li>- This Regulation applies to the entire road network that is publicly accessible to motorised traffic. By way of exception, it shall not apply to private roads, unless they are part of the comprehensive TEN-T road network or they are</li> </ul>	<p>TEN-T network, including Urban Nodes, and the other parts of the entire transport network of the Union.</p>

<sup>4</sup> As defined in the DR, ‘priority zones’ means road sections identified by national authorities where they consider this to be relevant, in particular in urban areas, that are not part of the comprehensive trans-European road network and are not motorways, based on the levels of recurring traffic congestion or other traffic management considerations.

Thematic area	Requirements per Delegated Regulation				
	DR (EU) 885/2013	DR (EU) 886/2013	DR (EU) 2015/962	DR (EU) 2022/670	DR (EU) 2017/1926
	situated within the priority zones defined by MSs.	network within their territory in order to focus on road sections and areas where traffic and safety conditions require the provision of information services.	consider this to be relevant	designated as a motorway or as a primary road. - From January 2025: the following data types shall be made available for the entire road network that is publicly accessible to motorised traffic: (a) <i>crucial types of data on regulations and restrictions</i> , and (b) <i>the crucial types of data on the state of the network</i> . - From January 2025 until 31 December 2027: the following data types shall be made available on comprehensive TEN-T, all motorways, and primary roads: (a) data on infrastructure, (b) other types of data on regulations and restrictions, (c) other types of data on the state of the network services, and (d) data on the real-time use of the network	
<b>Utilized formats and standards</b>	- For all data categories: DATEX II or other internationally compatible formats	DATEX II or other fully compatible and interoperable machine-readable format	- For static road data: any standardized machine-readable format (if available). - For dynamic road status data: DATEX II (CEN/TS 16157 and subsequently upgraded versions) or other fully compatible and interoperable machine-readable format.	- For static data on road infrastructure: INSPIRE data specification on transport networks, TN-ITS (CEN/TS17268 and subsequently upgraded versions) or DATEX II (EN 16157, CEN/TS 16157 and subsequently upgraded versions). - For static data on regulations and restrictions: DATEX II (EN	- For static travel and traffic data: DATEX II ( <a href="#">road transport</a> ), NeTEx CEN/TS 16614 – TAP-TSI or other technical documents defined in Regulation (EU) No 454/2011 and subsequent versions – IATA SSIM ( <a href="#">other modes of transport</a> ), INSPIRE data specification ( <a href="#">spatial networks</a> )

Thematic area	Requirements per Delegated Regulation				
	DR (EU) 885/2013	DR (EU) 886/2013	DR (EU) 2015/962	DR (EU) 2022/670	DR (EU) 2017/1926
			<ul style="list-style-type: none"> <li>- For dynamic traffic data: DATEX II (CEN/TS 16157 and subsequently upgraded versions) or other fully compatible and interoperable machine-readable format.</li> </ul>	<ul style="list-style-type: none"> <li>16157, CEN/TS 16157 and subsequently upgraded versions) or TN-ITS (CEN/TS 17268 and subsequently upgraded versions)</li> <li>- For dynamic data on the state of the network: DATEX II (EN 16157, CEN/TS 16157 and subsequently upgraded versions)</li> <li>- For dynamic data on the real-time use of the network: DATEX II (EN 16157, CEN/TS 16157 and subsequently upgraded versions)</li> </ul>	<ul style="list-style-type: none"> <li>- For dynamic travel and traffic data: DATEX II (<u>road transport</u>), SIRI CEN/TS 15531 and subsequent versions - TAP-TSI or other technical documents defined in Regulation (EU) No 454/2011 and subsequent versions (<u>other modes of transport</u>)</li> <li>- For both types of data: any other fully compatible and interoperable format</li> </ul>
<b>Harmonized data standard profiles</b>	No explicit reference to harmonized data standard profiles	No explicit reference to harmonized data standard profiles	No explicit reference to harmonized data standard profiles	No explicit reference to harmonized data standard profiles	<ul style="list-style-type: none"> <li>- For both static and dynamic travel and traffic data: shall be represented through minimum national profiles determined by Member States accessible through the national access point.</li> <li>- National profiles must be based on a common minimum European profile when it exists.</li> </ul>
<b>Terms and conditions for data access, exchange, and re-use</b>	<ul style="list-style-type: none"> <li>- Data shall be accessible for exchange and reuse by any public or private information service provider and/or parking operator on a non-discriminatory basis, and in accordance with access rights and procedures defined in Directive 2003/98/EC.</li> <li>- Charges for access to, exchange of, and reuse of public or private dynamic data shall</li> </ul>	<ul style="list-style-type: none"> <li>- The provision of road safety-related minimum universal traffic information should be, where possible, free of charge for all end users.</li> <li>- Data shall be accessible for exchange and reuse by any user of road safety-related minimum universal traffic information: (a) on a non-discriminatory basis; (b) within the Union</li> </ul>	<ul style="list-style-type: none"> <li>- Conditions applicable for the use or re-use of such data and associated services should be left to the parties concerned without prejudice to the provisions of Directive 2003/98/EC.</li> </ul>	<ul style="list-style-type: none"> <li>- Data on road infrastructure shall be accessible for exchange and re-use by any data user within the Union on a non-discriminatory basis.</li> <li>- Data on the state and real-time use of the network shall be accessible for exchange and re-use by any data user within the Union (a) on a non-discriminatory basis when provided by road authorities</li> </ul>	<ul style="list-style-type: none"> <li>- APIs that provide access to static and dynamic travel and traffic data shall be publicly accessible allowing users and end-users to register to obtain access.</li> <li>- Static and dynamic shall be reused in a neutral manner and without discrimination or bias.</li> <li>- When reusing static and dynamic travel and traffic</li> </ul>

Thematic area	Requirements per Delegated Regulation				
	DR (EU) 885/2013	DR (EU) 886/2013	DR (EU) 2015/962	DR (EU) 2022/670	DR (EU) 2017/1926
	<p>remain reasonable as referred to in the PSI Directive.</p> <ul style="list-style-type: none"> <li>- In some cases the reuse of public sector information will take place without a licence being agreed. In other cases a licence will be issued imposing conditions on the reuse by the licensee and dealing with issues such as liability, the proper use of data, guaranteeing accordance with data protection requirements, non-alteration and the acknowledgement of source</li> </ul>	<p>irrespective of the Member State of establishment; and (c) in accordance with access rights and procedures defined in Directive 2003/98/EC</p>		<p>and road operators and (b) without any obligation on holders of in-vehicle generated data and private service providers to grant access to or share any of their data with private data users (exchange and re-use of these data may be subject to terms and conditions determined by the private data holder).</p> <ul style="list-style-type: none"> <li>- Exchange and re-use of dynamic data may be subject to terms and conditions determined by the private data holder. However, in response to a request from a road authority or road operator, the data holder makes the data accessible following FRAND conditions.</li> </ul>	<p>data, the source of those data shall be indicated. The date and time of the last update of the static data shall also be indicated.</p> <ul style="list-style-type: none"> <li>- The terms and conditions for the use of the traffic and travel data provided through the national access point may be determined through a licence agreement. Those conditions shall not unnecessarily restrict possibilities for reuse or be used to restrict competition. Licence agreements, whenever used, shall in any event impose as few restrictions on reuse as possible.</li> <li>- Terms and conditions of linking travel information services shall be defined in contractual agreements between the travel information service providers.</li> <li>- Any financial compensation for the use of travel and traffic data or the linking of travel information services shall be reasonable and proportionate to the legitimate costs incurred of providing and disseminating the relevant travel and traffic data or linking travel information services.</li> </ul>



Thematic area	Requirements per Delegated Regulation				
	DR (EU) 885/2013	DR (EU) 886/2013	DR (EU) 2015/962	DR (EU) 2022/670	DR (EU) 2017/1926
<b>NAP type and operational architecture</b>	<ul style="list-style-type: none"> <li>- No specific NAP type is being recommended. However, MSs are required to provide the data through either a national or international access point.</li> <li>- For dynamic data, Member States (or national authorities) shall be responsible for setting up and managing a central national or international point of access referencing all individual single points of access of each truck parking operator and/or service provider on their territory in the interests of users.</li> </ul>	<p>NAPs can be implemented as a repository, registry, web portal, or a similar type of platform.</p>	<ul style="list-style-type: none"> <li>- Depending on the nature of the data, NAPs can be implemented as a repository, registry, web portal, or a similar type of platform.</li> <li>- Member States should regroup the existing public and private access points in a single unified point enabling access to all relevant data types.</li> <li>- Member States should be allowed to cooperate with one another to set up a common access point covering the available data of the participating Member States.</li> </ul>	<ul style="list-style-type: none"> <li>- The type of data can determine whether the NAP would be best suited as a repository, registry, web portal, or a similar type of platform.</li> <li>- Member States should regroup the existing public and private access points in a single unified point enabling access to all relevant data types.</li> <li>- National or common access points can also direct users to other locations where the data is available, without actually hosting the data themselves.</li> </ul>	<ul style="list-style-type: none"> <li>- Depending on the nature of the data, NAPs can be implemented as a database, data warehouse, data marketplace, repository, register, web portal, or a similar type of platform.</li> <li>- Member States should regroup the existing public and private access points in a single unified point enabling access to all relevant data types.</li> <li>- Member States should be allowed to cooperate with one another to set up a common access point covering the available data of the participating Member States.</li> <li>- In some cases, data providers operate across different Member States and therefore more than one access point is relevant to provide access to the travel and traffic data. However, efforts should be made to avoid unnecessary duplication of data and take into account the type of the relevant access points.</li> <li>- Relevant data and metadata could be listed in all NAPs having the repository type. If NAPs take the form of a database/data warehouse, then the data and metadata could be hosted in only one</li> </ul>

Thematic area	Requirements per Delegated Regulation				
	DR (EU) 885/2013	DR (EU) 886/2013	DR (EU) 2015/962	DR (EU) 2022/670	DR (EU) 2017/1926
					of them and listed in all others.
<b>Actors involved in data collection and provision chains</b>	Public and private parking operators and service providers	Public and private road operators and/or service providers	For both static and dynamic road status data: road authorities, road operators For dynamic traffic data: road authorities, road operators, and service providers	<ul style="list-style-type: none"> <li>- For static road infrastructure data and data on regulations and restrictions: road authorities, road operators, and tolling operators.</li> <li>- For dynamic data on the state of the network: road authorities, road operators, holders of in-vehicle generated, and service operators.</li> <li>- For dynamic data on the real-time use of the network: road authorities, road operators, service providers, and holders of in-vehicle generated data, recharging and refuelling-related stakeholders.</li> </ul>	For all types of data: transport authorities, transport operators, infrastructure managers or transport on demand service providers.
<b>Collaboration between data providers and users</b>	No explicit reference is made of concern to data collection, provision, and use.	No explicit reference is made of concern to data collection, provision, and use.	<ul style="list-style-type: none"> <li>- Road authorities, road operators, digital map producers and service providers using static road data shall collaborate in order to ensure that any inaccuracies related to static road data are signalled without delay to the road authorities and road operators from which the data originates.</li> <li>- When service providers use dynamic road status data provided by road authorities and road</li> </ul>	<ul style="list-style-type: none"> <li>- Users of static road infrastructure data, static data on regulations and restrictions, and dynamic data on the state of the network shall collaborate with data holders to ensure that any inaccuracies related to the data are signalled without delay to the data holder from which the data originates.</li> </ul>	No explicit reference is made of concern to data collection, provision, and use.

Thematic area	Requirements per Delegated Regulation				
	DR (EU) 885/2013	DR (EU) 886/2013	DR (EU) 2015/962	DR (EU) 2022/670	DR (EU) 2017/1926
			operators, they shall take into account, as far as possible, any temporary traffic management measures taken by the competent authorities.		
<b>Timeframe of data provision</b>	<p>No specific timeframe is mentioned, however:</p> <ul style="list-style-type: none"> <li>- The DR shall apply from 1 October 2015 to the provision of services already deployed on the date of entry into force of this Regulation.</li> <li>- It shall also apply from 1 October 2013 to the provision of services to be deployed after the date of entry into force of this Regulation.</li> </ul>	<p>No specific timeframe is mentioned, however:</p> <ul style="list-style-type: none"> <li>- The DR shall apply from 1 October 2013. However, with regard to the information service already deployed on the date of entry into force of this Regulation, it shall apply from 1 October 2015.</li> </ul>	<p>No specific timeframe is mentioned, however:</p> <ul style="list-style-type: none"> <li>- The DR shall apply from 13 July 2017.</li> </ul>	<p>No specific timeframe is mentioned, however:</p> <ul style="list-style-type: none"> <li>- The DR is repealed from 1 January 2025.</li> <li>- Until 31 December 2027, for some services, the geographic scope is restricted to comprehensive TEN-T, all motorways, and primary roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Static travel and traffic data corresponding to the “1<sup>st</sup> Level of Service” and related to the comprehensive parts of TEN-T network (including the core parts) shall be provided till 1 December 2019.</li> <li>- Static travel and traffic data corresponding to the “2<sup>nd</sup> Level of Service” and related to the comprehensive parts of TEN-T network (including the core parts) shall be provided till 1 December 2020.</li> <li>- Static travel and traffic data corresponding to the “3<sup>rd</sup> Level of Service” and related to the comprehensive parts of TEN-T network (including the core parts) shall be provided till 1 December 2021.</li> <li>- Static travel and traffic data corresponding to all levels of service and related to the entire Union transport network shall be provided till 1 December 2023.</li> </ul>
<b>Reporting to EC</b>	- MSs shall provide to the EC at the latest 12 months following	- MSs shall communicate to the EC the designated	- At the latest by 13 July 2017, MSs shall provide	- By 1 January 2023 at the latest, MSs shall provide the	- By 1 December 2019 MSs shall provide the EC with a

Thematic area	Requirements per Delegated Regulation				
	DR (EU) 885/2013	DR (EU) 886/2013	DR (EU) 2015/962	DR (EU) 2022/670	DR (EU) 2017/1926
	<p>the entry into force of this DR (a) the description of the national access point if applicable and (b) the competent bodies designated for assessment of compliance.</p> <ul style="list-style-type: none"> <li>- At the latest 12 months following the entry into force of this DR and every calendar year afterwards, MSs shall communicate to the EC (a) the number of different parking places and parking spaces on their territory, (b) the percentage of parking places registered in the information service and (c) the percentage of parking places providing dynamic information on the availability of parking spaces and the priority zones.</li> </ul>	<p>sections of the trans-European road network where traffic and safety conditions require the deployment of the road safety-related minimum universal traffic information service.</p> <ul style="list-style-type: none"> <li>- MSs shall provide to the EC at the latest 12 months following the entry into force of this DR (a) the description of the existing or envisaged national access point and (b) the national body designated for the assessment of compliance.</li> <li>- At the latest 12 months following the entry into force of this DR and every calendar year thereafter, MSs shall communicate to the EC (a) the progress they have made in implementing the information service, including the criteria used to define its level of quality and the means used to monitor its quality, (b) where relevant, a description of changes to the national access point and (c) the results of the assessment of compliance.</li> </ul>	<p>the EC with a report on the measures undertaken, if any, to set up a national access point and on the modalities of its functioning, and where relevant, the list of motorways not included in the comprehensive trans-European road network and identified priority zones.</p> <ul style="list-style-type: none"> <li>- At the latest by 13 July 2018 and every two calendar years thereafter, Member States shall provide the Commission with a report containing (a) the progress made in terms of the accessibility, exchange and re-use of the road and traffic data types set out in the Annex, (b) the geographical scope and the road and traffic 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, (c) the results of the assessment of compliance, (d) where</li> </ul>	<p>EC with the list and map visualisation of roads included in the primary road network.</p> <ul style="list-style-type: none"> <li>- Every three calendar years MSs shall provide the Commission (a) the progress made in terms of the accessibility, exchange and re-use of all data types, (b) the geographical scope of the data accessible via the National Access Point, 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, (c) where relevant, a description of changes to the national or common access point, and (d) the results of the assessment of compliance.</li> </ul>	<p>report on the measures undertaken, if any, to set up a national access point and on the modalities of its functioning.</p> <ul style="list-style-type: none"> <li>- Every other calendar year thereafter, Member States shall provide the Commission with a report containing (a) the progress made in terms of the accessibility and exchange of the travel and traffic data types set out in the Annex, (b) the geographical coverage and the travel and traffic data set out in the Annex accessible in the access point and the linking of travel information services, (c) the results of the assessment of compliance, and (d) where relevant, a description of changes to a and b.</li> </ul>



Thematic area	Requirements per Delegated Regulation				
	DR (EU) 885/2013	DR (EU) 886/2013	DR (EU) 2015/962	DR (EU) 2022/670	DR (EU) 2017/1926
			relevant, a description of changes to the national or common access point, and (e) where relevant, a description of changes to the priority zones.		



## 4. Gap analysis

In this chapter, the focus is on conducting a gap analysis of NAPs across Europe by evaluating the differences between the current implementation of NAP platforms and their targeted implementation. The goal is to identify the gaps and figure out how to mitigate them by applying different strategies and measures. The term “gap” refers to the space between “where we are” (the present state) and where “we want to be” (the target state), as illustrated in Figure 1. The present state describes the current features and functionalities of NAPs, while the targeted state refers to the desired level of NAP implementation.

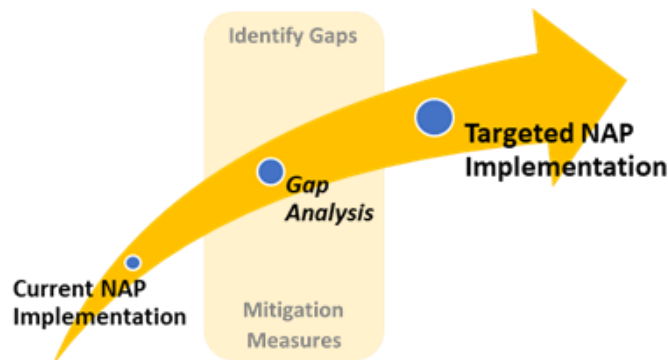


Figure 1: NAP implementation gap analysis

It is worth noting that the methodological approach described above is applied mainly considering aspects and requirements related to NAP data and metadata availability as well as to common formats and standards. This methodological approach could be also applied to other aspects as well, including, NAP types, and compliance assessment. However, the focus of the current report is on data and metadata availability and data exchange standards considering their high importance for the deployment of seamless ITS services across EU and the fact they act as prerequisite for addressing other requirements in the future. Furthermore, a dedicated analysis and discussion takes place considering an additional aspect of NAPs that relates to data quality considering its importance for the deployment of reliable ITS services across the Union. In the current analysis, it is generally accepted that a “gap” exists when an observation is valid for the vast majority of European countries. This is a rather simplistic yet essential assumption considering that main purpose of the current analysis is to provide an EU-wide outlook on aspects, such as what types of data are not available on NAPs and whether these data types are addressed and exchanged with uniform definitions, quality specifications and formats. Moreover, it is of purpose to help the on-going discussions on the vision of European Access Point by identifying EAP deployment barriers, which are also addressed as “gaps”. However, it should be acknowledged that the unavailability of a certain data type within a specific NAP is not necessarily a gap in the strict – legal – sense, considering that Delegated Regulations do not mandate data collection. However, such an unavailability does not promote the operation of NAPs as national data exchange infrastructures. Finally, it should be acknowledged that the unavailability of certain data types may have different causes and, therefore, different mitigation measures.

This chapter is divided into four primary sub-sections: Section 4.1 outlines the targeted implementation of NAPs, Section 4.2 explains the source from which information about the current status of implementation is obtained. Section 4.3 proceeds with the identification of gaps, while Section 4.4 presents a possible roadmap and recommendations for addressing these gaps. In particular, the first subsection analyses the ideal situation that each NAP can achieve by meeting the requirements specified in all DRs. The second subsection presents the structure and adopted approach in the NAP monitoring surveys conducted in the context of M3.2 and M3.3. The third subsection

compares the relevant identified requirements with the information about the status in order to highlight the targeted gaps. The final subsection provides a list on the mitigation measures and strategies that can be considered to bridge the gaps in a harmonious and interoperable manner.

#### **4.1. Targeted implementation**

As described in the previous chapter, each DR establishes specific requirements that will be met by NAPs. These requirements have been explicitly described in Table 7 denoting the targeted situation where all NAPs should strive to achieve. In terms of data that shall be exchanged, Table 7 indicates the specific data categories that need to be collected and exchanged. With regards to the provision of metadata, each DR specifies whether metadata shall be compulsorily published or not. As such, when a NAP covers all the obligations set out in DRs, it can be assumed that the desired level of implementation has been reached.

However, in reality this might not be the case for all NAPs considering that each country has adopted its own implementation strategy for traffic management, travel information, and other types of services. In addition, different types of transportation infrastructure and modes are operated within each MS. For this reason, some data types might not be relevant in certain countries or regions. A specific example constitutes the data category related to parking areas for trucks and commercial vehicles which falls under the DR (EU) 885/2013. There are several countries that do not operate designated areas for truck parking and commercial vehicles and therefore, the corresponding MSs are not obligated to provide such datasets.

#### **4.2. Current implementation**

In order to monitor the status of implementation of NAPs in Europe, leveraging the fact that all MSs take part in the NAPCORE project, a survey-based research methodology was adopted in the context of Milestone 3.2 and extended in Milestone 3.3. The primary data collection methodology was to conduct a survey targeting the recording of NAP status, data availability, and other implementation/operational aspects. The information in relation to the current implementation status was derived from the second NAP monitoring survey (M3.3). The survey covered details about the status of NAP implementation, including the URL of each NAP, and a description of whether it is operational or planned. It also included the availability of the data required by the DRs supplementing the ITS Directive (2010/40/EU), the supported language(s), and the presence of any quality requirements. It covered the type of each NAP (i.e., whether it hosts data or solely provides web links to data), the adopted data exchange standards (e.g., DATEX II), the support of metadata and/or discovery services, and the number of organizations (public or private) using NAP either as data providers or data consumers. Furthermore, additional questions have been asked for obtaining a clearer picture on the spatial and network/infrastructure coverage of available data. Additionally, the MMTIS-related data categories have been abstracted with an increased granularity targeting, among others, to provide transport mode specific insights. The survey was circulated amongst 30 countries. One completed survey was received per country. With the aim of addressing missing or imprecise information, desk research was conducted using the online information available on their official NAP.

#### **4.3. Gap identification**

##### **4.3.1. DR (EU) 885/2013**

According to Table 7, the functional scope of the data that shall be collected and provided in relation to DR (EU) 885/2013 encompasses the following data categories:

- Static data on parking areas for trucks and commercial vehicles
- Static data on safety conditions and equipment of parking areas



- Dynamic data on availability of parking places

The evidence collected from the survey executed in the context of Milestone 3.3, which is the most updated outcome of the NAP monitoring process, is summarized in Figure 2. As it can be observed in this figure, there are several countries that provide static data on parking areas for trucks and commercial vehicles (in total 21), but the number of countries also providing data on safety conditions and equipment of these parking areas is reduced to 16. This observation is not classified as a gap, since the number of countries that do not provide relevant data is limited (the maximum number of countries that could provide data on safety conditions and equipment would be 21). Beyond that, it appears that a very limited number of countries provide dynamic data on availability of parking places. This observation is classified as the first gap.

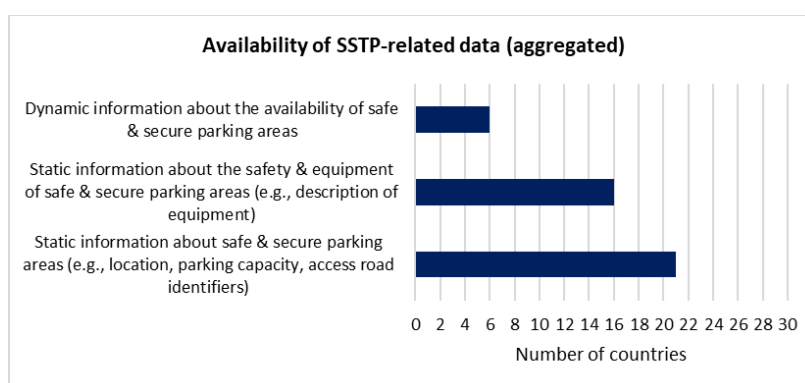


Figure 2: EU-wide availability of SSTP-related data.

Furthermore, according to Table 7, in DR (EU) 885/2013 there is no explicit reference to whether the provided data should be accompanied by metadata. However, since metadata is key enabler of data discoverability and findability, their existence is addressed as a “soft” requirement. Considering the evidence collected from the survey executed in the context of Milestone 3.3, only a few countries providing SSTP-related data, without simultaneously providing metadata (Figure 3).

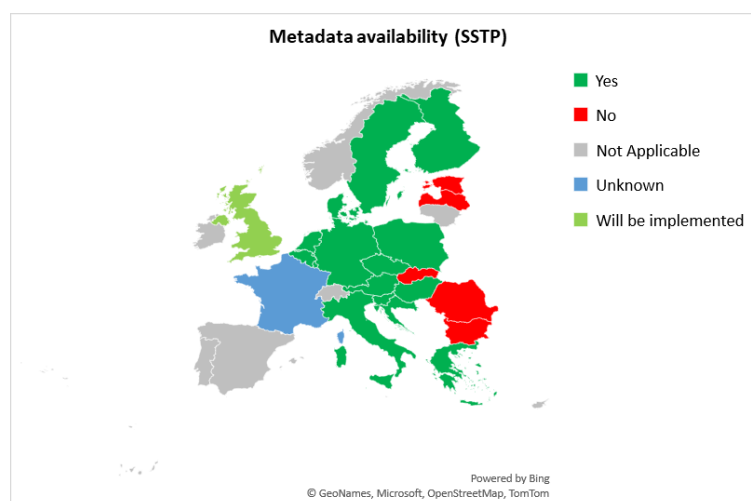


Figure 3: EU-wide availability of SSTP-related metadata.

According to the requirements set out in DR (EU) 885/2013, the utilized formats and standards for all data categories in relation to DR (EU) 885/2013 shall be in compliance with DATEX II or other internationally compatible formats. Therefore, it is assumed that the use of formats and standards other than DATEX II constitutes an interoperability barrier. Figure 4, Figure 5, and Figure 6 present, respectively, the data standards used for the exchange of static information about safe and secure



truck parking places, static information about the safety conditions and equipment of safe and secure truck parking places, and dynamic information about the availability of safe and secure truck parking places. As it can be observed DATEX II constitutes the mainly used standard for the exchange. There are only a few MSs which publish their datasets in other formats and standards including spreadsheets, which shall be avoided.

Beyond the above and even though there is no strict requirement resulting from DR (EU) 885/2013, the surveys executed in the context of M3.2 and M3.3 reveal that very different versions of DATEX II are currently used by European countries. This represents a cross-border interoperability barrier and, therefore, another “gap” in the context of the current report.

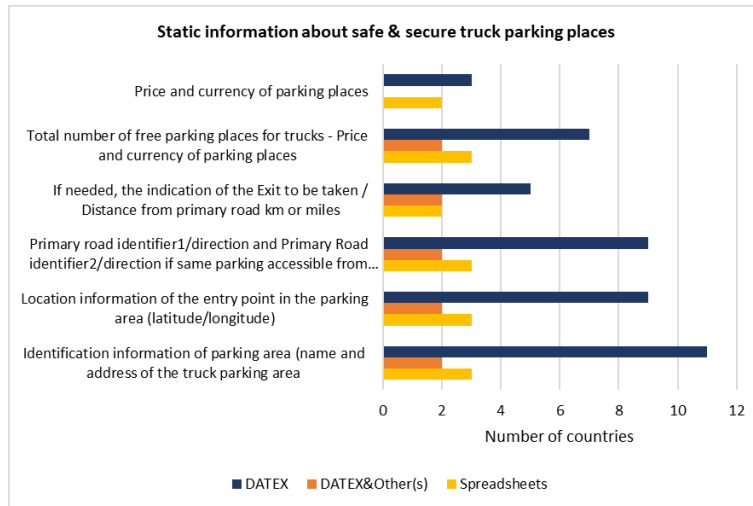


Figure 4: Data standards used for the exchange of static information about safe and secure truck parking places.

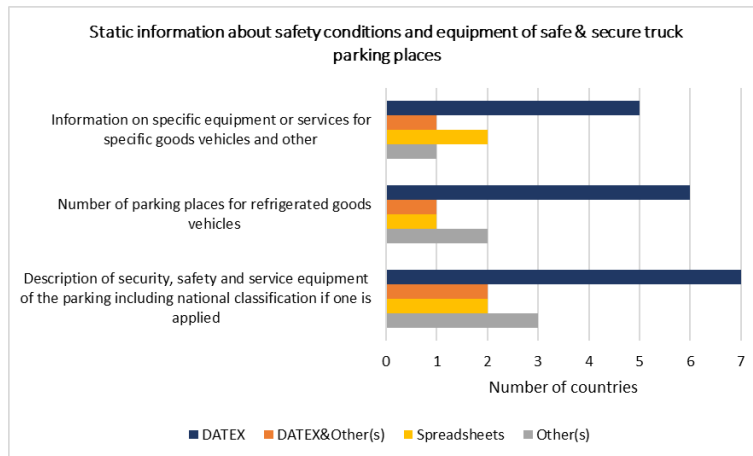


Figure 5: Data standards used for the exchange of static information about the safety conditions and equipment of safe and secure truck parking places.

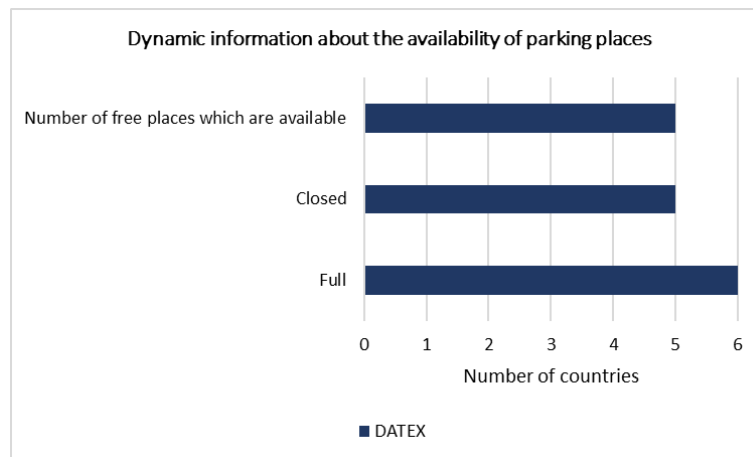


Figure 6: EU Data standards used for the exchange of dynamic information about the availability of safe and secure truck parking places.

In terms of standards and methods used for encoding point or linear locations, Figure 7 shows that there is a lack commonly utilized standards or methods across Europe. This is also addressed as an interoperability barrier and “gap” in the context of the current report.

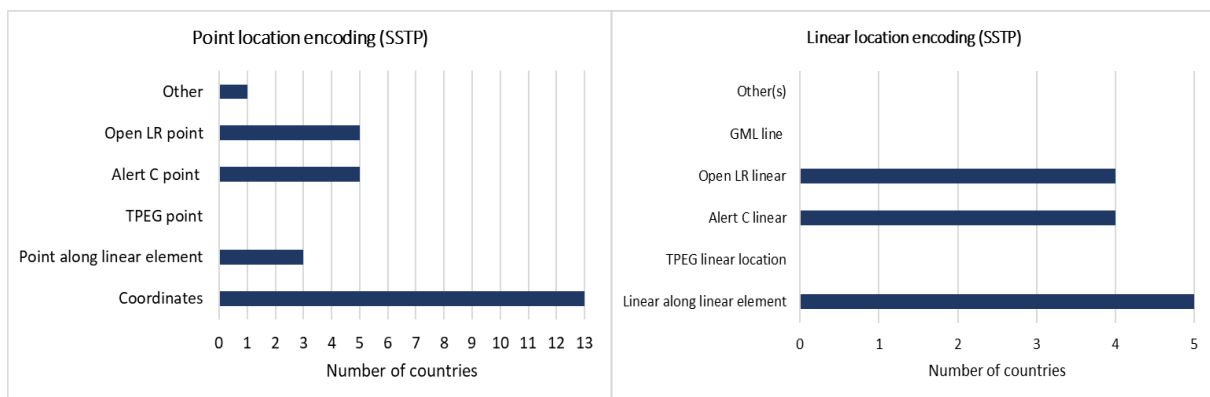


Figure 7: Location referencing methods used for the provision of SSTP-related data.

#### 4.3.2. DR (EU) 886/2013

According to Table 7, the functional scope of the data that shall be collected and provided in relation to DR (EU) 886/2013 encompasses the following data category:

- Dynamic data for the provision of road safety-related traffic information services

Figure 8 summarizes the evidence gathered from the survey conducted in the context of Milestone 3.3. As it appears, most European countries (23 out of 30) provide dynamic data about road safety-related events and conditions. Following the adopted methodological approach, this observation cannot be classified as a “gap”.

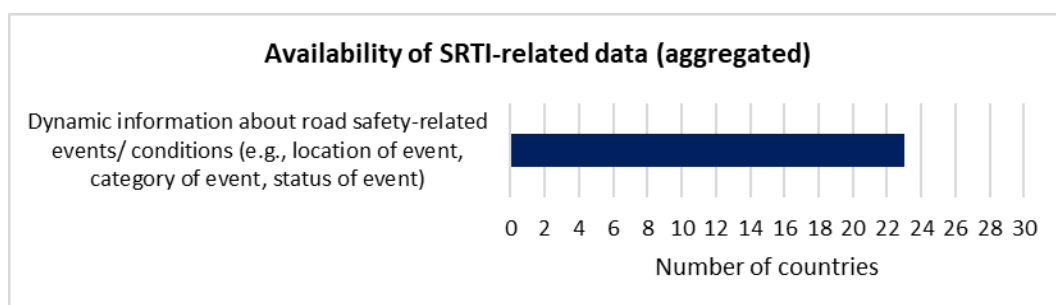


Figure 8: EU-wide availability of SRTI-related data.

Additionally, in accordance with Table 7, there is no explicit reference in DR (EU) 886/2013 to whether the provided data should be accompanied by metadata. Nevertheless, and as mentioned above, since metadata plays a crucial role in data discoverability and findability, their existence is addressed as a “soft” requirement. As can be observed in Figure 9, the vast majority of European countries seem to comply with this requirement.

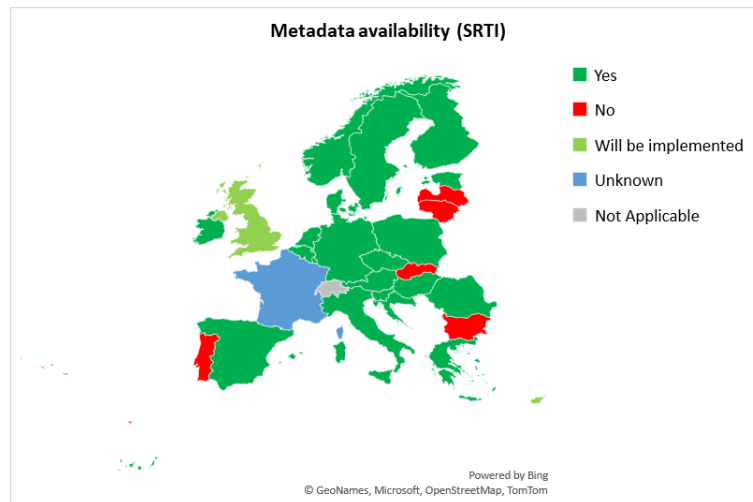


Figure 9: EU-wide availability of SRTI-related metadata.

Furthermore, in accordance with Table 7, dynamic data for the provision of road safety-related traffic information services shall comply with DATEX II standard or other fully compatible and interoperable machine-readable format. As it can be observed in Figure 10, this requirement is respected by most European countries.

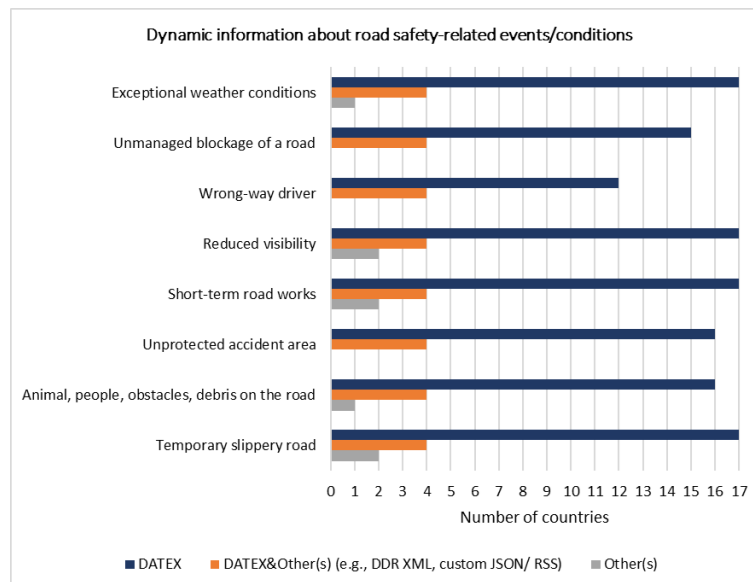


Figure 10: Data standards used for the exchange of dynamic information about road safety-related events/conditions.

Beyond the above, and even though there is no strict requirement resulting from DR (EU) 886/2013, the surveys executed in the context of M3.2 and M3.3 reveal that very different versions of DATEX II are currently used by European countries. This represents a cross-border interoperability barrier and, therefore, another “gap” in the context of the current report.

In terms of standards and methods used for encoding point, linear, or area locations, Figure 11 shows that there is a lack of commonly utilized standards or methods across Europe. This is also addressed as an interoperability barrier and “gap” in the context of the current report.

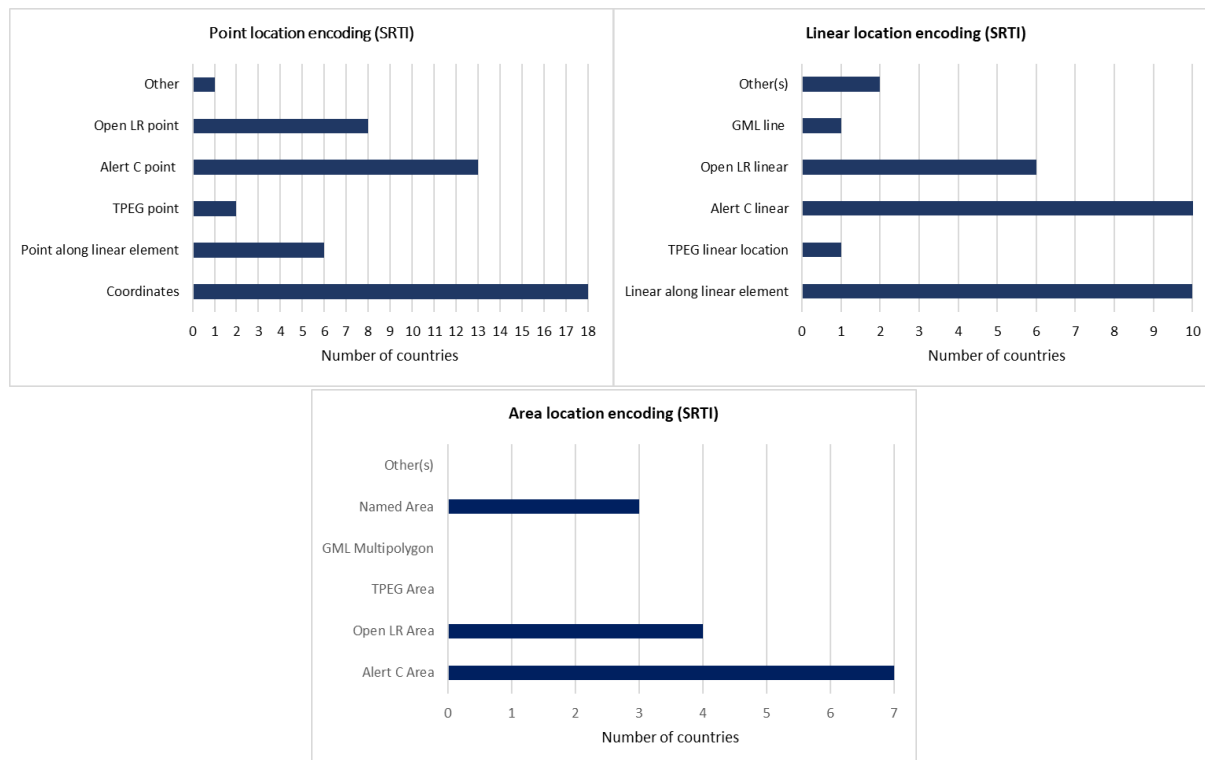


Figure 11: Location referencing methods used for the provision of SRTI-related data.

### 4.3.3. DR (EU) 2015/962

The current subsection relies only on the requirements resulting from DR (EU) 2015/962. The requirements resulting from DR (EU) 2022/670 are not considered in this subsection, since this DR applies from 1 January 2025.

According to Table 7, the functional scope of the data that shall be collected and provided in relation to DR (EU) 2015/962 encompasses the following data categories:

- Static road network data
- Static data on the usage of the road network
- Static data on roadway/roadside infrastructure
- Dynamic data on road status
- Dynamic data on traffic conditions

As can be observed in Figure 12, the number of countries that provide data about (a) the road network and (b) roadway and roadside infrastructure is 19 and 20, respectively. Furthermore, 24 countries provide dynamic data about road status, while 17 countries make dynamic data available with regard to prevailing traffic (flow) conditions. Static information about the usage of the road network is less available, with only 8 countries providing relevant data through their NAP. Considering these numbers, the only data category the availability of which can be addressed as a “gap” is the one related to the provision of static information about the usage of road network. This is mainly attributed to the challenging nature of the included (in this category) data ontologies, such as traffic circulation plans and freight delivery regulations.

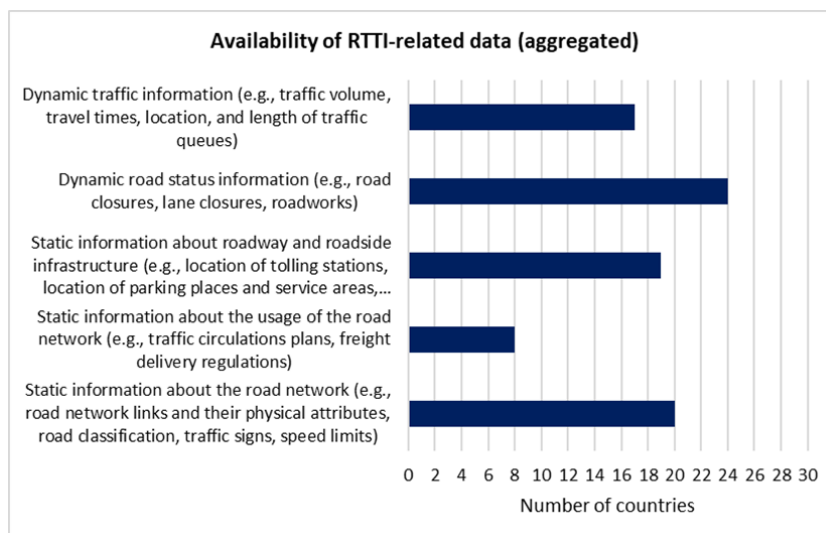


Figure 12: EU-wide availability of RTTI-related data.

Figure 13 depicts the European-wide availability of metadata for the RTTI-related datasets. As it can be seen, the vast majority of MSs provide metadata for the relevant data categories in line with the relevant requirement of DR (EU) 962/2015.

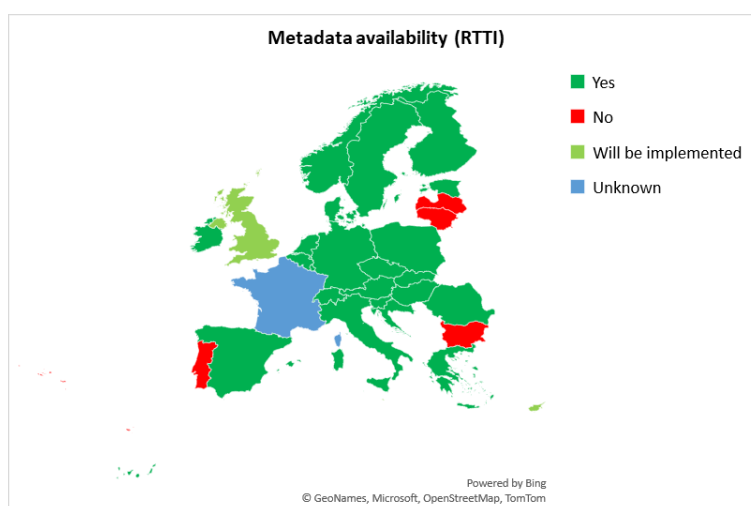


Figure 13: EU-wide availability of RTTI-related metadata.

In accordance with Table 7, static RTTI data shall be provided by following any available standardized format. Dynamic data, on the other hand, shall be provided by following DATEX II (CEN/TS 16157) or other fully compatible and interoperable machine-readable formats. As can be observed in Figure 16, the requirements about static data are respected in the majority of European countries. Furthermore, as can be observed in Figure 15 and Figure 16, the majority of European countries utilize DATEX II standard to exchange dynamic RTTI-related data.

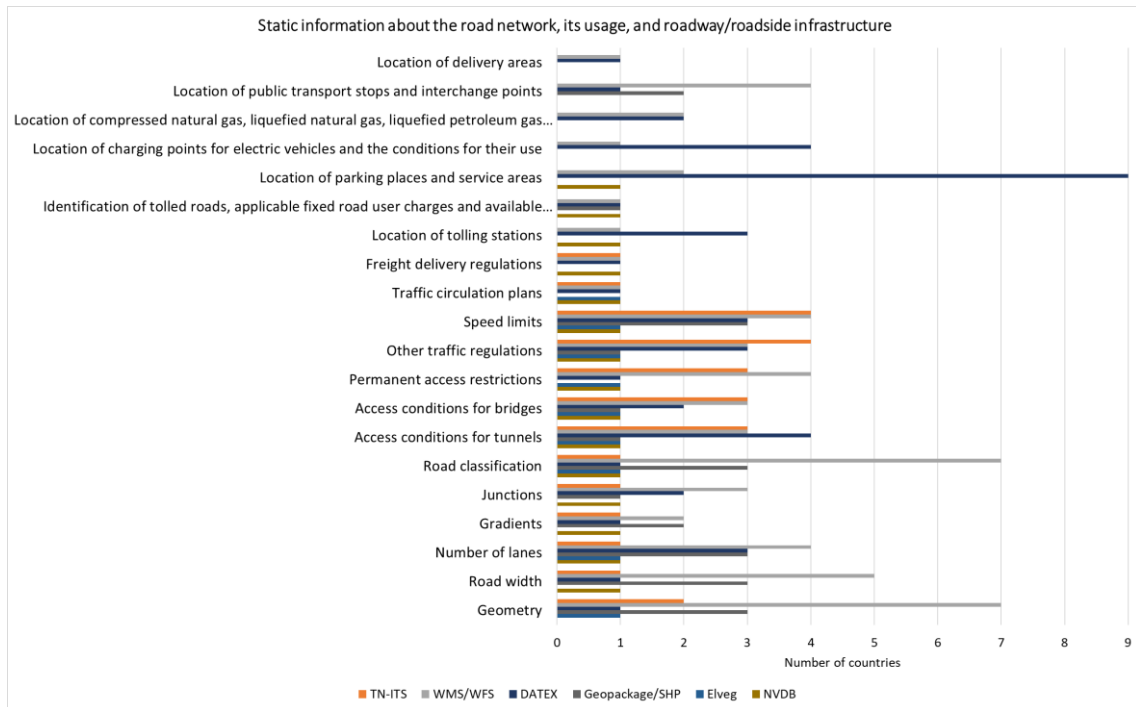


Figure 14: Data standards used for the exchange of static information about the road network, its usage, and roadway/roadside infrastructure.

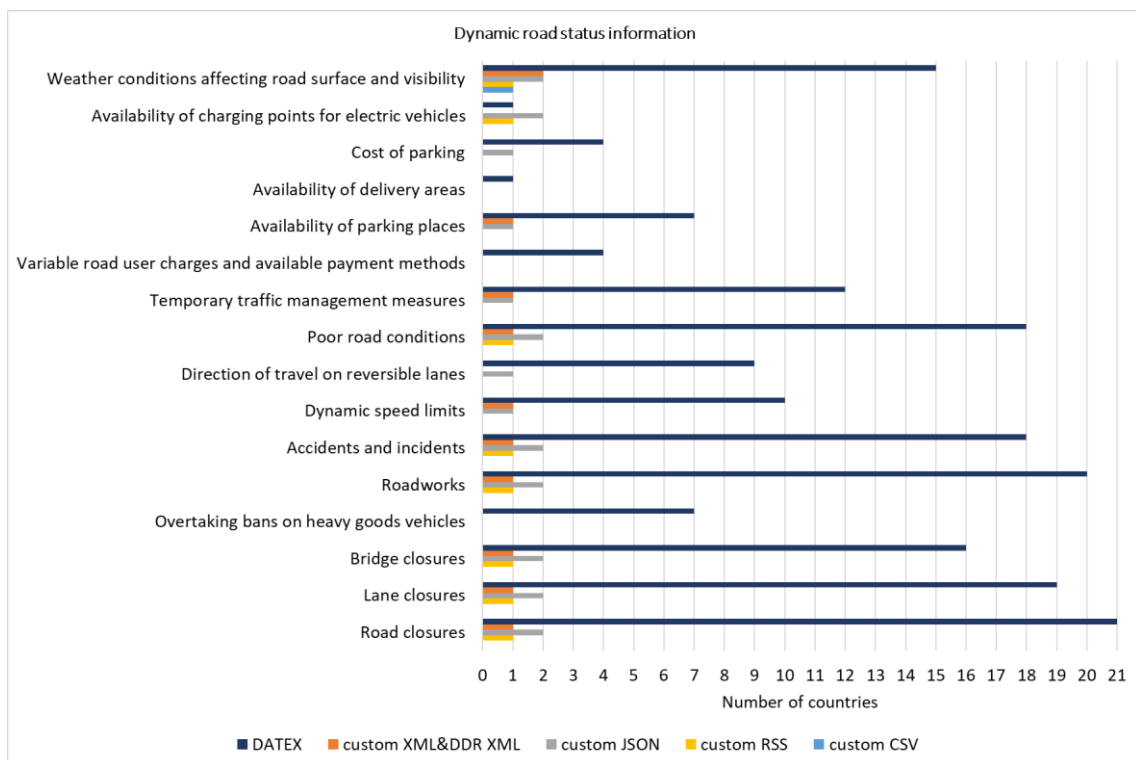


Figure 15: Data standards used for the exchange of dynamic road status information.

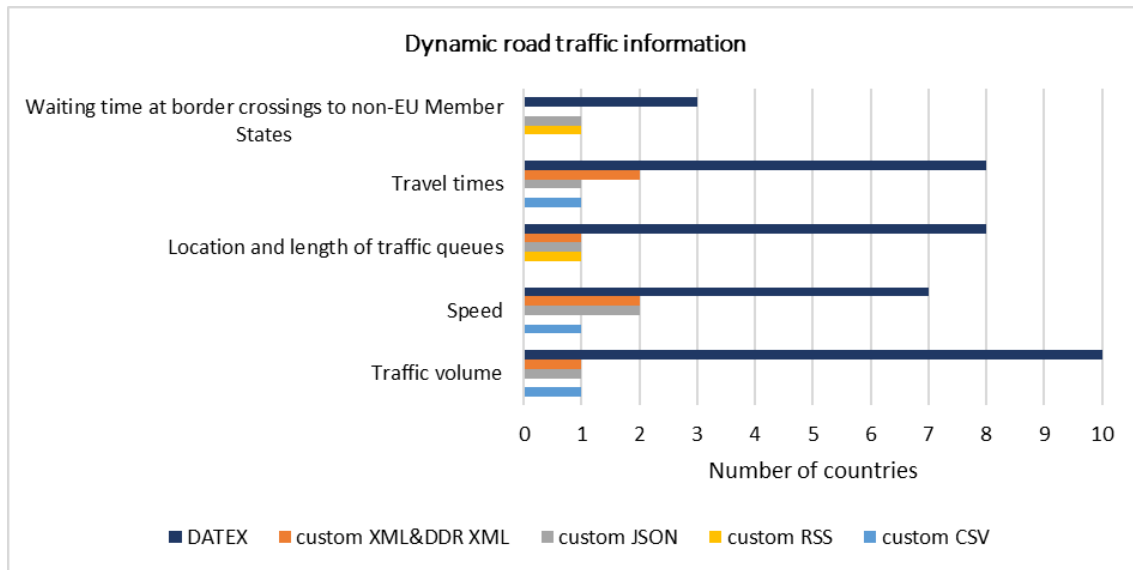


Figure 16: Data standards used for the exchange of dynamic road traffic information.

Beyond the above, and even though there is no strict requirement resulting from DR (EU) 2015/962, the surveys executed in the context of M3.2 and M3.3 reveal that very different versions of DATEX II are currently used by European countries. This represents a cross-border interoperability barrier and, therefore, another “gap” in the context of the current report.

In terms of standards and methods used for encoding point, linear, or area locations, Figure 17 shows that there is a lack commonly utilized standards or methods across Europe. This is also addressed as an interoperability barrier and “gap” in the context of the current report.

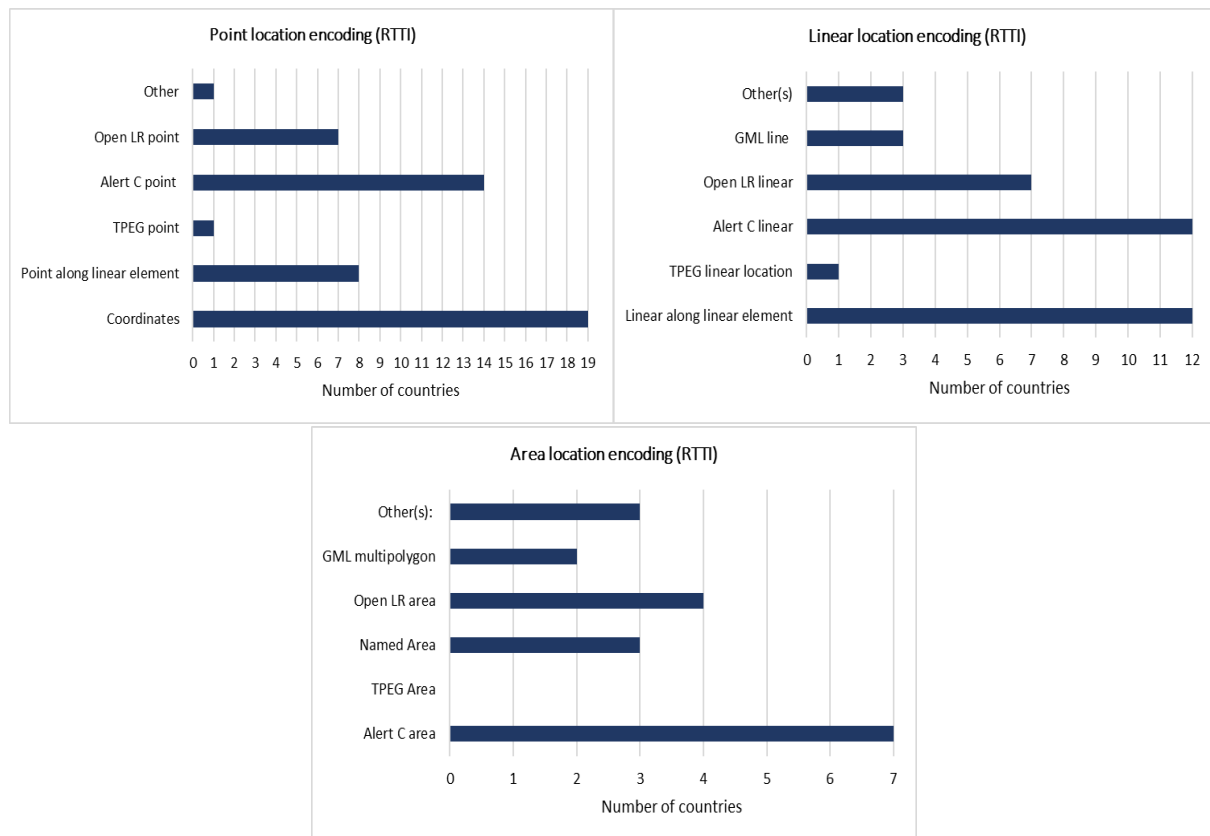


Figure 17: Location referencing methods used for the provision of RTTI-related data.

#### 4.3.4. DR (EU) 2017/1926

According to Table 7, the functional scope of the data that shall be collected and provided in relation to DR (EU) 2017/1926 encompasses the following data categories:

- Static data for location search
- Static data on trip plans and auxiliary information
- Static data for trip plan computation
- Static data on traveler services
- Static data on detailed common standard and special fare queries
- Dynamic data on passing times, trip plans, and operational information
- Dynamic data on availability of services and relevant infrastructure

Figure 18 indicates the European-wide availability of data in relation to the above data categories. Provided information is expanded for the transport modes that are of concern to DR (EU) 2017/1926. It appears that the only data category that is to a significant extent covered by NAPs involves static data for location search as well as static data on trip plans for scheduled transport modes. Therefore, a significant gap constitutes the lack of static and dynamic MMTIS-related data.

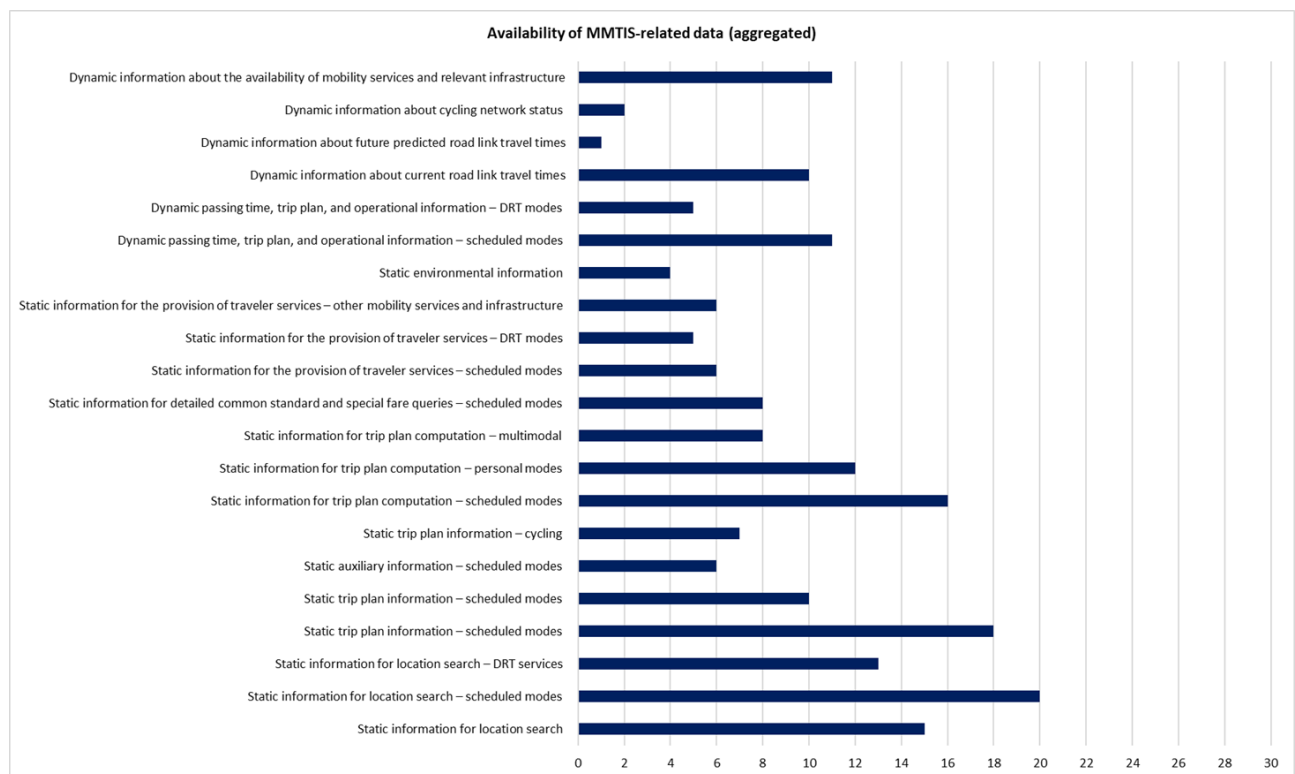


Figure 18: EU-wide availability of MMTIS-related data.

Figure 19 depicts the European-wide availability of metadata for the MMTIS-related datasets. As it can be seen, the vast majority of MSs provide metadata for the relevant data categories.

According to Table 7, static travel and traffic data shall be provided following: (a) DATEX II when provided information concerns the road network, (b) NeTeX CEN/TS 16614, TAP-TSI, or IATA SSIM when provided information concerns other modes of transport, and INSIPRE data specific when information concerns spatial networks. According to the same table, dynamic travel and traffic data shall be provided following: (a) DATEX II when provided information concerns the road network, (b) SIRI CEN/TS 15531 or TAP-TSI when provided information concerns other modes of transport. For both



types, other formats and standards are allowed in the premise that they are fully compatible and interoperable with the mentioned ones.

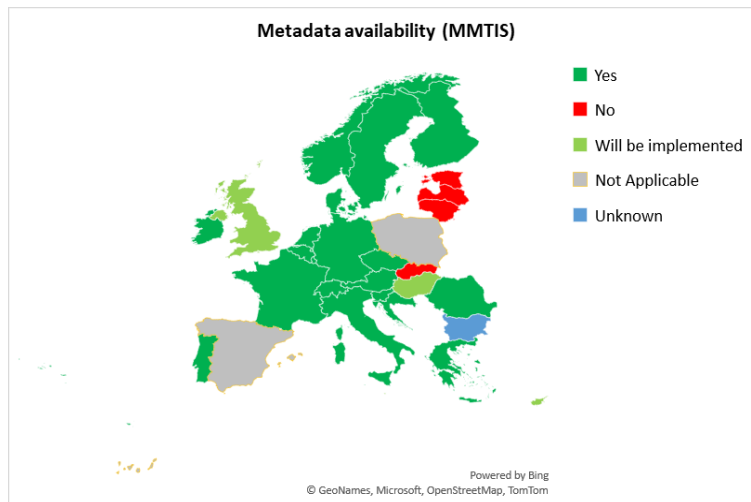


Figure 19: EU-wide availability of MMTIS-related metadata.

As can be observed in Figure 20, some countries use the INSPIRE data specification or other compatible formats (e.g., WMS/WFS) for providing location search data related to spatial networks (e.g., address identifiers, topographic places, and POIs). Only a few countries provide such data by following formats that are not proven compatible with INSPIRE data specification (e.g., OSM or spreadsheets/CSV). With respect to data ontologies related to specific transport modes, the use of formats not proven compatible with the ones explicitly mentioned in Table 6 appears more frequent. This is addressed as a gap.

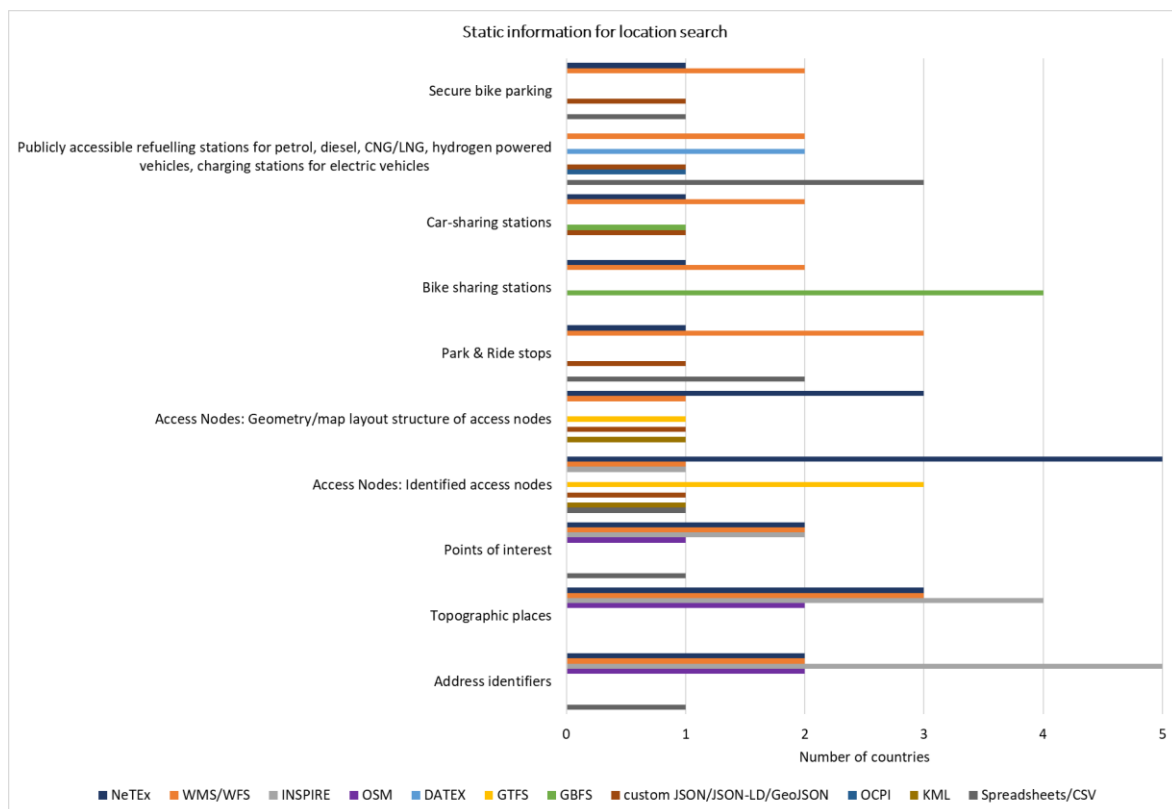


Figure 20: Data standards used for the exchange of static information for “location search”.

Figure 21 indicates the utilized standards for providing data supporting common standards and special fare queries. It appears that the use of formats not provenly compatible with NeTEx or other explicitly mentioned in Table 6 appears frequent. This is also addressed as a gap.

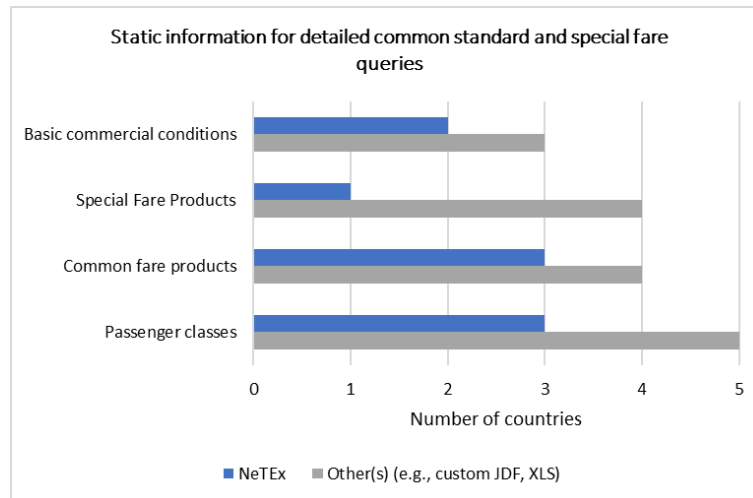


Figure 21: Data standards used for the exchange of static information for “detailed common standard and special fare queries”.

Figure 22 indicates the utilized formats for providing auxiliary trip plan-related data and data supporting availability check. It appears that the use of formats not provenly compatible with NeTEx is frequent. This is also addressed as a gap.

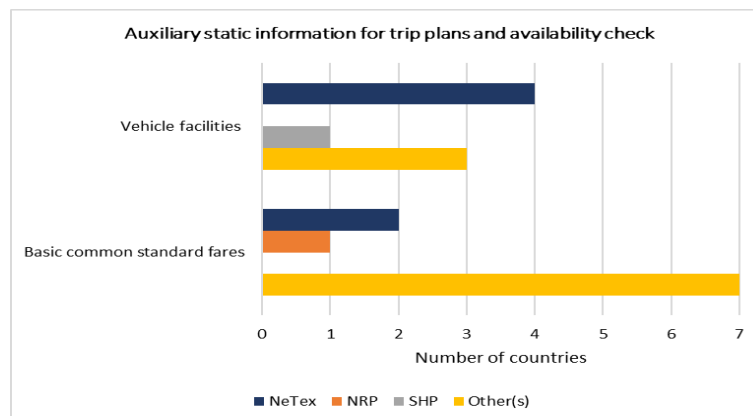


Figure 22: Data standards used for the exchange of auxiliary static information for “trip plans and availability check”.

Figure 23 indicates the utilized formats for providing data supporting trip plan computation for scheduled transport modes and road transport. As regards scheduled transport modes, the most frequent utilized standards are NeTEx and GTFS. These data standards are addressed as complementary and not fully compatible with each other. NeTEx supports the exchange of data that are the structural elements of data ontologies included in this figure (e.g., timetables and planned interchanges). On the other hand, GTFS focuses on the provision of information directly consumable by journey planning systems. In this respect, another gap is identified here that relates to the frequent non-use of NeTEx standard. Regarding the remaining data ontologies not related with scheduled transport modes, a wide variety of formats are utilized. This is also addressed as a gap.

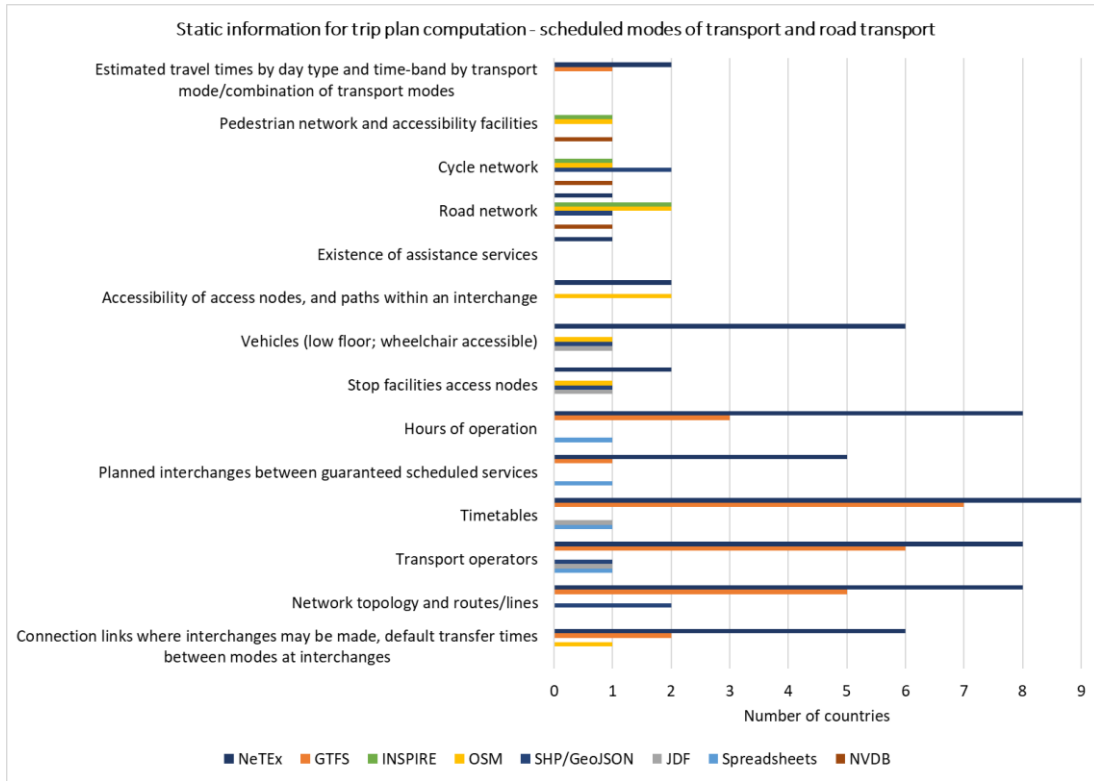


Figure 23: Data standards for the exchange of static information for “trip plan computation – scheduled modes of transport and road transport”.

Figure 24 indicates the utilized formats for providing dynamic information for passing times, trip plans, and dynamic auxiliary information. It appears that the use of formats classified as “other” and not provenly compatible with DATEX or SIRI is widespread. This is also addressed as a gap.

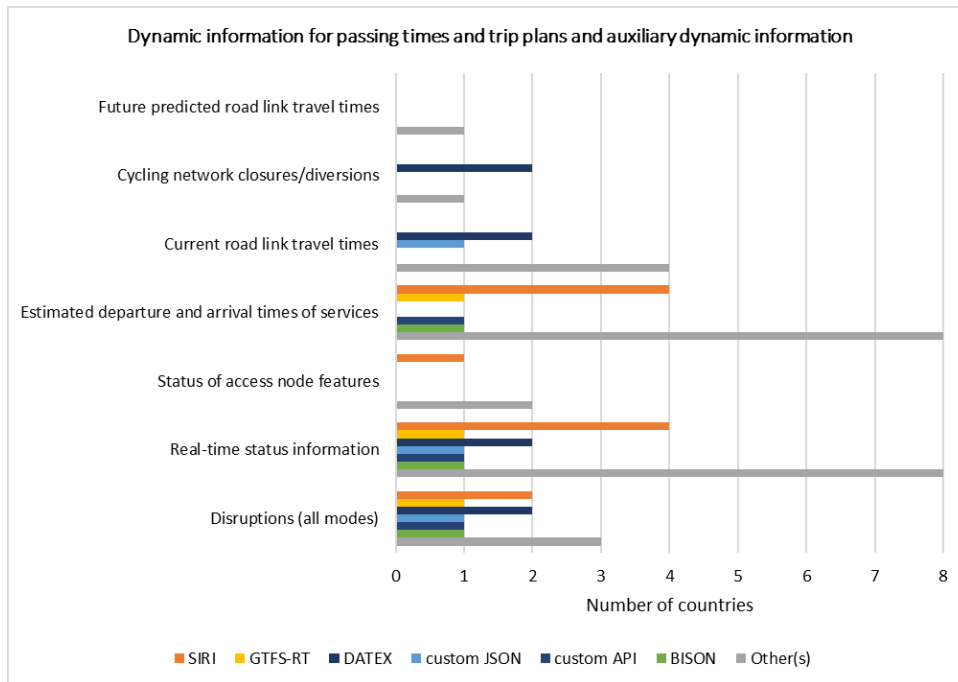


Figure 24: Data standards for the exchange of dynamic information for “passing times and trip plans” and dynamic auxiliary information”.

Figure 25 provides information about the availability of national NeTeX and SIRI profiles across Europe. It appears, especially for SIRI, that a considerable number of countries have either not developed a



national profile or any plan or strategy for developing a national profile. This is also addressed as a gap considering the requirements of DR (EU) 2017/1926.

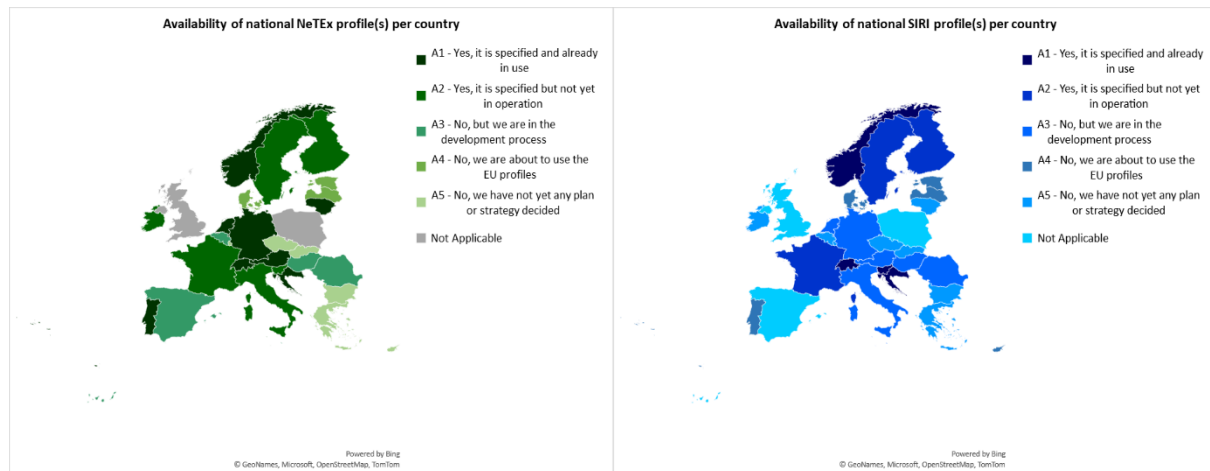


Figure 25: Availability of national NeTeX and SIRI profiles per country.

The outcomes of the surveys executed in the context of M3.2 and M3.3 show that the majority of the national NeTeX profiles that have been already specified are compatible with European Passenger Information Profile (EPIP). In particular, the national profile of ten countries is compatible, while the national profile of only three countries is not compatible; however, these three countries have expressed their interest to make it compatible and requested for any available assistance.

In terms of standards and methods used for encoding point, linear, or area locations, Figure 26 shows that there is a lack commonly utilized standards or methods across Europe. This is also addressed as an interoperability barrier and “gap” in the context of the current report.

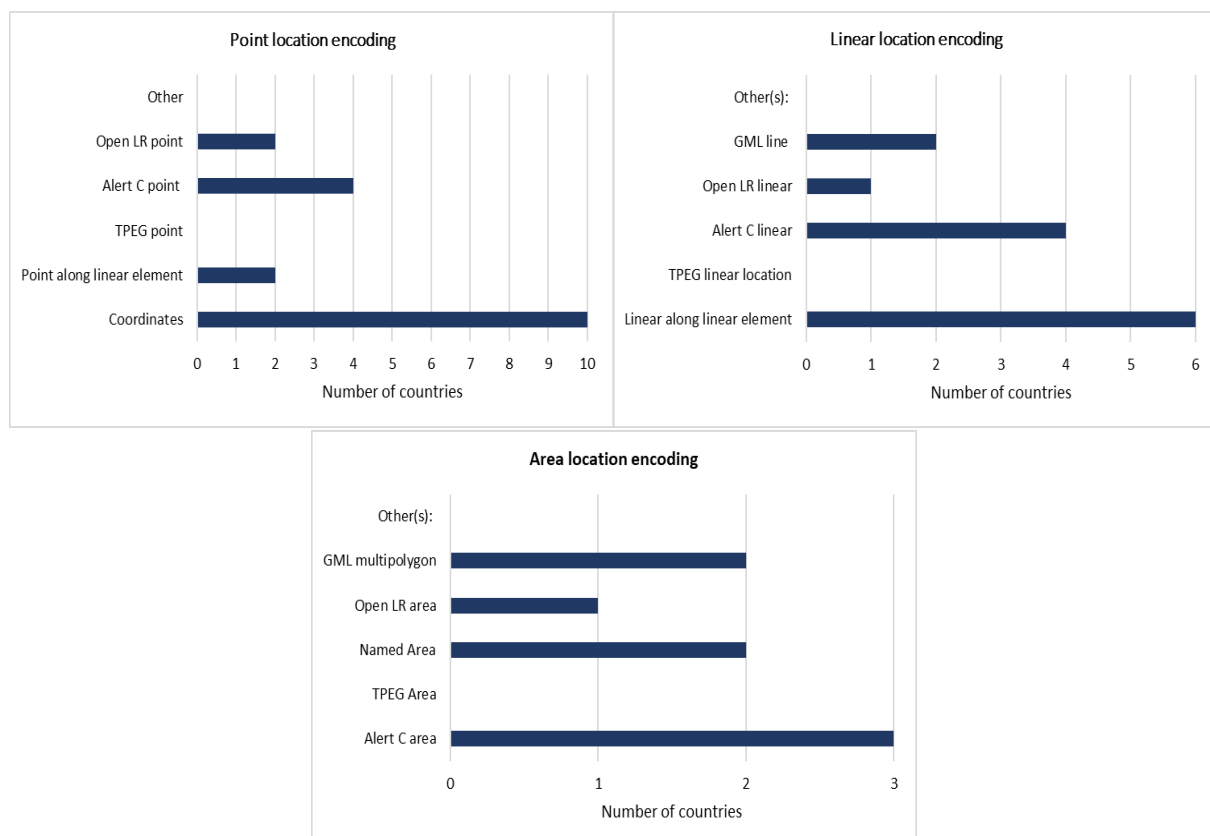


Figure 26: Location referencing methods used for the provision of MMTIS-related data.

### 4.3.1. Data quality

The analysis of the ITS policy framework executed in Section 3 shows that all DRs supplementing the ITS Directive make direct or indirect reference to data quality by providing guidelines on several aspects, such as updating the information provided through NAPs in a timely manner or checking its accuracy. However, such guidelines are only in certain cases specific. For this reason, the predecessor of the NAPCORE project (EU-EIP) has developed a series of quality packages in an effort to provide specific guidelines towards the assessment of the quality of the data provided through NAPs. In this respect, the extent to which these quality packages have been incorporated into the operational procedures of NAPs is addressed as a “soft” requirement. The surveys executed in the context of M3.2 and M3.3 included a specific question on data quality. The purpose of this question was to obtain insights into the extent to which MSs provide quality-related information and adhere to specific quality criteria when describing the quality of their datasets.

Table 8 presents the acquired feedback. As can be observed, almost half of the countries responded that they do not provide quality information for the datasets published on their NAPs. However, some countries have already implemented measures to provide information about data quality on their NAPs, such as update frequency and latest update dates, while others are still in the process of adopting quality criteria. Taking into consideration the significance of providing accurate and time-valid information through NAPs as well as the absence of positive feedback from MSs on the way through the topic of data quality is handled, another “gap” is identified.

Table 8: Overview of responses regarding the quality of data published through NAPs.

Country	Data quality
<b>Austria</b>	Completeness of Meta Data, Textual quality description by publisher
<b>Belgium</b>	This process includes a (partial) quality check of the provided (meta)data.
<b>Bulgaria</b>	Unknown
<b>Croatia</b>	Unknown
<b>Cyprus</b>	At present, no quality assessment procedures are in place.
<b>Czech Republic</b>	The quality is NOT reported at the moment (just as a written report accompanying self-declaration form = available to MS as authority). Traffic Information are internally checked for their consistency by operators at National Traffic Information Centre (NTIC). Some data sources (i.e., police) are trusted implicitly, other data i.e., from municipalities are checked. Error in data, if found are internally logged as issues into the reporting system and then dealt with (reaction and correction time being one of the KPIs). There is a room for improvement in structural quality and completeness of the published data sources.
<b>Denmark</b>	The document: “Procedures for establishing quality” will be forwarded via email and can be found below described by screenshots
<b>Estonia</b>	Unknown
<b>Finland</b>	No quality information provided
<b>France</b>	List of validation tools (MMTIS): <a href="https://transport.data.gouv.fr/validation">https://transport.data.gouv.fr/validation</a>
<b>Germany</b>	We recommend using the quality requirements defined by the “Quality Packages”, as published by EU EIP and NAPCORE WG 3. We also provide a voluntary metadata field “quality information” that can be filled for each data set. However, this is rarely used, and we are not aware of data providers that actually provide any quality information so far
<b>Greece</b>	The quality of accommodated data is freely assessed by data providers. Relevant predefined (fixed) fields in the metadata page of each publication include the update frequency of data resources (applicable for dynamic data) and date of the last publication update.
<b>Hungary</b>	Update frequency
<b>Ireland</b>	Unknown
<b>Italy</b>	Unknown
<b>Latvia</b>	Not applicable
<b>Lithuania</b>	The datasets published in the NAPs are formed on the basis of data captured in the following state information systems: - Traffic Information System accumulating dynamic traffic data (traffic counter data, road weather station data, Traffic registration data, EV charging stations data, etc.); - Road asset management information system accumulating static road data (roads elements, road parameters, environmental protection, traffic safety, speed cameras, traffic data, road works, road



	statistics, etc.); - Public transport multimodal journey planning system accumulating journey planning data (public transport timetables, routes, stops, stations, airports, etc.). In the information systems listed above there are implemented the data quality validation tools such as e. g. completeness of mandatory fields, compliance of the data format with the requirements of the data specification, etc.
<b>Luxembourg</b>	There are no formal quality indicators published on the NAP
<b>Malta</b>	NAP is not operational yet
<b>Netherlands</b>	Not yet available
<b>Norway</b>	Metadata quality is indicated for each dataset on the NAP. Metadata quality is meant to be an indicator data owners can use to evaluate the quality of their data. Work in progress on assessment of data quality for selected datasets.
<b>Poland</b>	Not applicable
<b>Portugal</b>	The multimodal travel information metadata includes the quality information elements specified by the coordinated metadata catalogue, namely the update frequency, the quality description, and the national body assessment status. These elements are, however, provided by the data publishers and are not controlled by IMT – Instituto da Mobilidade e dos Transportes, I.P.
<b>Romania</b>	Unknown
<b>Slovakia</b>	We would welcome methodological materials and specifications for the harmonization of data in the NAP
<b>Slovenia</b>	Data quality is not reported at the moment. For the time being, only quality measure is the feedback from the data receivers (service providers). Data receivers create their profile on the NAP, through which they can contact us whenever they have issues.
<b>Spain</b>	Data quality is not reported
<b>Sweden</b>	Unknown
<b>Switzerland</b>	Unknown
<b>United Kingdom</b>	Unknown

#### 4.4. Roadmap: recommendations to fill the gaps

As observed in the analysis in the previous subsections, the current state of NAPs across Europe does not fully comply with the targeted implementation based on the requirements that have been identified in Section 3. As regards data availability and as mentioned before, none of the DRs supplementing the ITS Directive mandate data digitalization. However, several gaps have been identified in effort to promote the seamless operation and use of NAPs as national data exchange infrastructures. The magnitude of the identified gaps is not equal across all DRs.

With respect to DR (EU) 885/2013, the first and the sole identified gap revolves around the low provision rate by NAPs of dynamic information about the availability of parking space within safe and secure truck parking areas. In particular, only six countries appear to provide such information through their NAP. This can be attributed to the fact that the provision of such information is often subject to the availability of detection equipment within truck parking areas. The availability of such equipment requires considerable capital and operational expenditures from the side of parking operators. In this respect, a potential strategy for mitigating this gap (that may be considered by Member States) has as a first step the conduction of detailed recordings of the so-called priority zones, considering among others freight traffic volumes and the significance of the motorways included in each territory for European freight transport and logistics corridors. On that basis and depending on the outcomes of the necessary national consultations, MSs may decide to utilize any available resources for deploying the required infrastructure, establishing the appropriate data flow protocols and systems, and, therefore, increasing the provision rate of dynamic information about the availability of parking space within safe and secure truck parking areas. However, it shall be considered that infrastructure-related concerns is beyond the scope of the NAPs and the DRs supplementing the ITS Directive and, thus, should be assessed in a national basis, according to national priorities.

With respect to DR (EU) 886/2013, it appears that the European coverage of minimum road-safety universal traffic information is adequate. In particular, 23 out of 30 countries provide the respective



data. As such, no substantial relevant gap has been identified concerning data and metadata availability. This statement does not imply that the widespread European-wide availability of SRTI data is beyond the project's purposes. However, in order to identify the most noteworthy gaps we need to stick to some assumptions that we made.

With respect to DR (EU) 2015/962, it seems that the least available data category on NAPs involves the provision of static information about the usage of the road network, including data elements/ontologies under the responsibility of road authorities and road operators, such as digitized traffic signs, traffic circulation plans and freight delivery regulations. In particular, only eight countries' NAPs provide these data elements without recognition on its completeness. There are several reasons behind this observation. To name just a few, the low availability of digitized traffic signs can be attributed to lack of technical solutions assisting the collection or digitization of the required information and its publication on NAPs. Moreover, the low availability of information on traffic circulation plans and freight delivery regulations can be attributed to lack of a commonly agreed definition of what is exactly a traffic circulation plan or a freight delivery regulation, including the minimum information that needs to be provided in relation to them. Therefore, it is recommended that national, regional, and local road authorities should introduce or enhance technical tools assisting the collection and digitization of information on traffic signs under their jurisdiction (e.g., via the integration of traffic sign cadastres into GIS databases or the joined exploitation of vehicle connectivity and computer vision algorithms in cooperation with service providers and vehicle manufacturers) and the automated exposure of the collected/digitized information to NAPs via an agreed data standard (e.g., TN-ITS or DATEX II). Furthermore, it is considered of high importance to deeply analyse the concept of traffic circulation plans and freight delivery regulations towards the achievement of commonly accepted definitions, the identification of the minimum information that needs to be exchanged in support of a series of highly prioritised use cases, and the subsequent development and harmonization of data standards. By that means, it will be much easier for road operators and road authorities to become aware of what information needs to be collected and made available through NAPs as well as with what types of stakeholders they need to cooperate for either acquiring this information or making the best use of it. Active, rule-based, and collaborative traffic management models as well as the concept of Urban Vehicle Access Regulations (UVARs) are expected to provide valuable insights into the discussions and analyses that shall be carried out.

With respect to DR (EU) 1926/2017, two substantial gaps are identified. The first gap relates to the very low availability of a wide list of data categories and elements on NAPs. Prominent examples constitute the limited availability of static information about traveller services as well as the limited availability of static information for detailed common standard and special fare queries. Other examples constitute the very limited availability of static environmental information and dynamic information about future predicted road link travel times and cycling network status. Considering the latter example, it also appears that on demand (DRT) transport modes and personal transport modes are represented to a lesser extent on NAPs across Europe. The second gap relates to the adoption of widely different formats for providing both static and dynamic MMTIS-related data.

The formulation of a strategy for filling the first gap is challenging due to the fact that it may involve several different actions. A first action may be to more effectively promote NAPs to public transport operators and operators of on-demand transport modes (e.g., taxi, car sharing, ride hailing) in an effort to convince them to publish their data. Another action may involve a structured discussion with municipalities and other transport authorities to open up the data that may have already available in a digital format. Moreover, given that the low availability of static information for detailed common standard and special fare queries may be attributed to lack of open interfaces on behalf of transport operators and the involvement service providers, another action may involve the implementation of



usable and easy to follow technical solutions that will support transport operators to publish their data on the NAPs.

A strategy for filling the second gap includes (a) the mapping of data formats and standards currently utilized by several European countries to the standards explicitly suggested within DR (EU) 1926/2017 and (b) the development of technical solutions that will support the conversion of existing data feeds to data feeds complying with standards explicitly suggested within DR (EU) 1926/2017.

An issue that is particularly relevant for all DRs discussed above is that European countries are currently using very different versions of DATEX II. This is addressed as an interoperability barrier and gap. A strategy for filling this gap may involve the provision of technical guidelines and tools for converting data feeds complying to legacy versions of DATEX II to data feeds complying to the latest version and dissemination on this topic. Similarly, another issue that is relevant for all DRs analysed above is that European countries appear to utilize very different location encoding methods and standards. A strategy for filling this gap may involve the identification of universal or at least “highly suggested” methods, if possible, for each DR and, if not possible, for each highly prioritized use case under the scope of each DR. It is of note that several of the above-mentioned findings coincide with the feedback received by several providers of ITS and navigation services.

As regards data quality, the results of the survey indicate that many countries do not have procedures and do not check through a systematic framework the quality of the data provided through their NAP. On the other hand, although some countries execute quality checks, there is no harmonization on the applied procedures. Moreover, some stages of the information provision chain may not be included in these quality checks. Actions for mitigating those gaps include a further cooperation and collaboration among MSs, the extension of existing quality frameworks to cover a wider list of data categories as well as, more importantly, their pilot application in the context of tailor-made case studies to ensure their practical applicability.

Table 9 summarizes the identified gaps and the corresponding mitigation measures.

*Table 9: Summary of data gaps and mitigation measures*

Related DR	Gap identified	Mitigation measure
885/2013	Low availability of dynamic information regarding parking space within safe and secure truck parking areas	Recording of priority zones (sections defined by national authorities exhibiting a shortage of spaces at one or several safe and secure parking places, which can be alleviated by providing information on other unused parking capacities in the same zone). Potential exploitation of any available resources to increase the deployment rate of the required detecting equipment (depending on national plans, needs, and priorities).
2015/962	Low availability and lack of terminology on the information about the usage of the road network	Detailed definition on behalf of the ITS community of data elements, such as traffic circulation plans and freight delivery regulations, towards a deep understanding of the minimum information that needs to be provided in relation to them and update of reference standards. Remark: The current measure does not imply that NAPs shall provide definitions for the above data elements. It implies that if a





		<p>detailed definition is made available by the ITS community through endeavors like the NAPCORE project, the provision of relevant data through NAPs will become easier.</p> <p>Relevant road data (e.g., data on traffic signs) can be generated by parties involved in the installation and maintenance of the corresponding physical infrastructure. By that means, changes in the road infrastructure could be communicated just-in-time.</p> <p>Remark: The current measure does not imply that MS shall enforce anyone to generate and collect data on the usage of the road network. This is beyond the scope of and contradictory with the ITS Directive. It instead indicates some parties that may support the enhancement of data availability.</p>
2017/1926	Very low availability of several data categories	<p>Promote NAPs and their technical capabilities to attract more public transport operators and operators of on-demand transport modes as data providers to the NAP.</p>
		<p>Convince municipalities and other transport authorities to open up any already available digitized data (under terms and conditions deemed appropriate by them on a case-by-case basis).</p>
		<p>Implementation on behalf of the ITS community of usable and easy to follow technical solutions enabling the generation of relevant datasets. By using these solutions MSs can improve their supporting to public transport operators and operators of other modes to ensure alignment with relevant regulations.</p>
2017/1926	Diversity of adopted formats and standards	<p>Mapping of utilized formats and standards to the elements of the standards mentioned within DR (EU) 2017/1926.</p>
		<p>Development of converting tools. By that means, non-standardized formats can more easily be converted to standardized formats recognized by the DRs supplementing the ITS Directive.</p>
2017/1926	Unequal coverage of on-demand and personal transport modes (compared to scheduled transport modes)	<p>Promotion of alternative transport modes in route planners and integrated mobility services (MaaS). This may increase the usefulness of relevant data and therefore their accommodation rate on/through NAPs in the long run.</p> <p>Remark: This measure does not imply that MSs are the sole responsible for route planners or shall collect real-time data regarding the availability of mobility service. It conveys the</p>

		message that once on-demand and personal mobility modes are promoted in the context of integrated mobility services, relevant data may become more desired, available, and accessible across Europe.
	Low availability of NeTEx and SIRI national profiles	Provision of technical guidance through wikis and easy to follow material (guidance for defining national profiles). For those MSs with national profiles, technical guidance through wikis and easy to follow material should be published on the NAP.
All	Lack of common understanding and harmonised procedures for data quality measurement	Increased cooperation and collaboration among MSs with the aim to identify specific standard or standards for quality framework(s).
		Extension on behalf of the ITS community of quality frameworks to cover data types and elements that are not currently covered.
		Pilot testing of the quality frameworks to ensure their applicability in practice.
	Lack of commonly utilized location referencing methods	Determination of highly suggested methods for each data category considering the requirements of each DR and their main use cases thereof. Remarks: Considering that certain data categories may relate to more than one DRs, the underlying requirements and use cases may lead to different suggestions.
Wide variety of DATEX II versions currently in use in European countries (including legacy versions)	Provision on behalf of the ITS community of technical guidance and best practices to support the update of existing DATEX II feeds.	

## 5. Conclusions

The activities of WG3 of the NAPCORE project aim, among others, to bring consistency to the content of European National Access Points (NAPs) based on the current European legislative framework for Intelligent Transport Systems (ITS). These activities consider both recorded and anticipated progress in the entire ITS domain.

The current report provides an overview of existing and updated DRs, with a focus on their structure and content. It gives emphasis on the common points of all DRs, which are analyzed through the relevant articles. Furthermore, this report aims to provide an in-depth analysis of the requirements derived from all DRs and lay the ground for the identification of specific gaps relevant for the operation of NAPs. These gaps are identified by comparing current and targeted NAP implementations. This assessment considers the identified requirements, specifically those corresponding to existing DRs, as well as the results of the survey on NAP and NAP data availability monitoring conducted in the context of Milestones 3.2 and 3.3. The survey results provide insight into the current state of NAP data availability across Europe, as well as additional aspects such as the extent to which metadata are published by NAPs of Europe, the utilized data standards and formats, and information regarding data quality. By assessing the differences between current implementation of NAPs and their targeted implementation, several gaps are identified. As a next and final step, this report suggests a set of potential measures for mitigating the identified gaps.