Third Report on NAP data availability

NAP content and accessibility

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Abstract

This report provides information about the progress of NAP implementations across Europe and data availability in 2022 - 2023. It provides further insight into the implemented data standards and other topics related to NAP design and operation.

It serves as a knowledge centre and basis for achieving a harmonized NAP deployment and operation across Europe.

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Abbreviations

Abbreviation	Meaning
EC	European Commission
CAT	Core Alignment Team
CEN	European Committee for Standardization
DRs	Delegated Regulation(s)
EC	European Commission
GBFS	General Bikeshare Feed Specification
GDPR	General Data Protection Regulation
GTFS	General Transit Feed Specification
ITS	Intelligent Transport Systems
JSON	JavaScript Object Notation
MMTIS	Multimodal Travel Information Services
MS	EU Member States
NAPs	National Access Point(s)
NBs	National Bodies
NAPCORE	National Access Point Coordination Organisation for Europe
NeTEx	Network Timetable Exchange (CEN Technical Specification)
PIM	Platform Independent Model
PSM	Platform Specific Model
RRP	Recommended Reference Profile(s)
RSP	Recommended Service Profile(s)
RTTI	Real-Time Traffic Information
SC, SCOM	Steering Committee
SCS	Steering Committee Support
SIRI	Standard Interface for Real-time Information (CEN Technical Specification)
SRTI	Safety-Related Traffic Information
SSTP	Safe and Secure Truck Parking
SWG	Sub-working Group
TMC	Traffic Management Center
Transmodel	Public Transport Reference Data Model (EN 12896)
UML	Unified Modelling Language
XML	eXtensible Markup Language
W3C	World Wide Web Consortium
WFS	Web Feature Service
WMS	Web Map Service
WG	Working Group
WP	Working Programme

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1. Introduction

This report provides insight on the status of National Access Points across Europe, including the actual level of implementation of NAPs among Member States. By that means, it paves the ground for the identification and mitigation of gaps that formed during the past decade.

PRIORITY ACTION	DELEGATED REGULATION	THEME	COMMON REFERENCE
(e)	(EU) No 885/2013	provision of information services for safe and secure parking places for trucks and commercial vehicles	Safe and secure truck parking (SSTP)
(c)	(EU) No 886/2013	data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users	Safety related traffic information (SRTI)
(b)	(EU) 2015/962 (EU) 2022/670[1]	the provision of EU-wide real-time traffic information services	Real-time traffic information (RTTI)
(a)	(EU) 2017/1926	the provision of EU-wide multimodal travel information services	Multimodal travel information services (MMTIS)

Table 1: Commission Delegated Regulations and corresponding ITS Directive priority actions

By sharing the knowledge and experiences of Member States (MS) that have already implemented NAPs, other MS can benefit from this opportunity. At the same time, it could lead to a more harmonised implementation of NAPs across Europe.

This report provides an overview of:

- NAPCORE project and monitoring activities (Chapter 1)
- Status of NAPs implementation, data availability (Chapter 2)
- Standards and common formats (Chapter 3)
- The status of NAPs considering other crucial aspects, such as metadata availability or compliance assessment (Chapter 4)

[1] applies from 2023 (some part) and 2025

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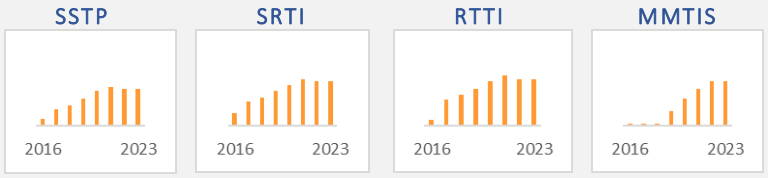
2023 NAP Monitoring Highlights

30

NAP implementers provided feedback in the on-line survey of 2023

Number of operational NAPs



NAP STATUS

- Most European countries operate a NAP for SRTI and RTTI.
- The status of European NAPs for SSTP depends on the availability of safe & secure truck parking areas.
- Several countries are in the process of developing a new NAP interface (with status impact).
- The number of operational NAPs for MMTIS is the same as in the previous survey.

DATA AVAILABILITY

- Static SSTP-related data are made available by the NAP of 15 to 18 countries.
- Only 5 countries appear to make available through their NAP dynamic SSTP-related data.
- SRTI-related data are made available by the NAP of 23 countries.
- Static & dynamic RTTI-related data are made available by the NAP of up to 22 countries (excluding traffic circulation plans and freight delivery regulations).
- Big diversity on the availability of MMTIS-related data.

IMPLEMENTED STANDARDS

- SSTP-SRTI-RTTI: DATEX II constitutes the most frequently implemented data standard.
- MMTIS: Big diversity on the standards/formats implemented (NeTEx, GTFS, TN-ITS, INSPIRE, DATEX II, and other national formats).
- Frequently used location referencing methods: Coordinates & ALERT C point (point), Alert C linear & linear along linear element (line), Alert C area & Open LR area (area).

METADATA & NAP ARCHITECTURE

- Provision of metadata per operational NAPs: SSTP:73%, SRTI:69%, RTTI:78%, MMTIS:75%
- 1/3 of NAPs for SSTP are purely web-link type while another 1/3 are only database type.
- 12 NAPs for SRTI are purely web-link type, 1/3 are purely database type, and only six are mixed type.
- 12 NAPs for SRTI are purely web-link type, 1/3 are purely database type, and only six are mixed type.
- 13 NAPs for MMTIS are purely web-link type, four are purely database type, and 9 are mixed type.

COMPLIANCE ASSESSMENT

- Self-declarations have been submitted for a very limited number of NAP datasets (0-30%) in more than half European countries.
- However, within seven countries, self-declarations have been submitted for most datasets published on their NAP (86-100%).
- Compliance assessment has not been executed in more than half European countries, while in only five countries it has been executed for most datasets published on their NAP (86-100%).

OPEN DATA

- The “open data” trend is maintained in the NAP ecosystem since 20 countries estimate that more than 86% of their datasets conform to open licensing models.
- CC0 and CC BY-SA are the most frequently used licensing models.

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1.1. Scope & objectives of NAPCORE WG3

The activities of WG3 contribute to the harmonisation of European NAPs content by taking into consideration the existing developments and potential future progress in the ITS domain. The activities aim to facilitate the fair, trusted, and enhanced accessibility to ITS-related data through the investigation of aspects related to data availability (technical and procedural), data quality, data reuse and data visualisation. Its specific objectives are as follows:

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

Table 2 enlists the tasks of WG3. The current report falls under the scope of Task 3.1.

Task 3.1	Data content requirements arising from current and future developments
Task 3.2	European NAPs data quality
Subtask 3.2.1	Quality Frameworks
Subtask 3.2.2	Guidance & best practices for quality assessment
Subtask 3.2.3	Quality certification for NAP datasets
Task 3.3	Data access and reuse
Subtask 3.3.1	Technical options for data visualisation
Subtask 3.3.2	Terms and conditions of data reuse (incl. data pricing)
Subtask 3.3.3	Implications of GDPR
Task 3.4	Data Exchange Vision
Task 3.5	Training for NAP content and accessibility

Table 2: Tasks of NAPCORE WG3

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1.2. Monitoring & Harmonisation of NAPs – WG3 in NAPCORE

One of the activities of WG3 involves the monitoring of the on-going implementation of NAPs to assess their progress and content status, enable mutual learning, and pave the ground for their future EU-wide harmonization.

Currently, NAPs are being or have been implemented by almost all MS; however, the implementation of NAPs across Europe varies. For instance, some countries have separate NAPs to support different Delegated Regulations supplementing the ITS Directive, while some other support all Delegated Regulations through a single platform (point of access). Similarly, the type of NAPs (e.g., repository of links, databases, or both) and compliance assessment procedures differ significantly. Therefore, the current work aims at monitoring EU-wide NAP developments, contributing to harmonisation, and acting as a knowledge centre for among others: Member States, NAP operators, and Nominated National Bodies (NB).

The objectives of the current report can be summarized as follows:

- Monitor the development and data availability of NAPs across Europe.
- Identify commonalities, substantial differences, and improvement needs.
- Enable knowledge exchange between/among various MS in the field of NAPs.

The current report constitutes the third version of a series of relevant reports to be published throughout NAPCORE. Its content and methodological approach is based on the second version, encompassing slight updates in the methodological framework to better match countries' needs. However, certain aspects of the survey have not been included considering that the current version aims to provide a quick update on the NAP status and data availability. In the upcoming iteration, a full extent of the survey will be presented accompanied by an online monitoring tool visualizing all countries' responses. This visualization tool is currently under development. Further details are provided in the following section(s).

1.3. Methodology

Leveraging the fact that all MSs take part in the NAPCORE project, the primary data collection methodology was to conduct a third survey[2] targeting the recording of NAP status, data availability, and other implementation/operational aspects. Responses to this survey were provided via an online platform, namely, lime survey. This platform has been used for collecting the responses of all countries in a structured and homogeneous manner. Lime survey will play the role of back-end of the NAP online monitoring tool that will be presented in the next versions of the current milestone. Lime survey was selected as the platform for collecting answers primarily due to its ability to immediately store responses in a dedicated database. 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 covered 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. The survey is retrospective, and answers are interpreted as valid for the previous semester of 2023.

[2] The adopted structure of the questionnaire behind this survey is similar to the structure adopted during the preparation of the previous versions of the current report.

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2. Status of implementation

This chapter describes the status of implementation of National Access Points in Europe as well as their data availability, based on the NAPCORE research conducted in 2023.

This chapter starts with describing the rationale applied for recording the status of NAP implementation across Europe. This is then followed by the status description of NAPs supporting (a) the provision of information services for safe and secure truck parking places (SSTP), (b) the provision of safety-related traffic information services (SRTI), (c) the provision of real-time traffic information services (RTTI), and (d) the provision of multimodal travel information services (MMTIS). Subsequently, it describes the methodology applied for recording data availability in the European NAPs, which is then followed by the presentation of the derived results.

2.1. Monitoring the status of European NAPs

With the aim of monitoring the status of implementation of NAPs across Europe, a survey-based research methodology was adopted. Relevant to this chapter questions were intended to receive information about the status of NAP implementation with regard to the requirements set by the DRs supplementing the ITS Directive (2010/40/EU). The following terminology is adopted for describing in a harmonized, consistent, and trackable manner the status of each NAP:

- **"Operational"**, when data according to the DRs supplementing the ITS Directive are made available to the public through a NAP (dedicated or not), without recognition of completeness (of the exchanged data). Therefore, "Partly Operational" NAPs are addressed as operational (i.e., one part of data is made available while another is not).
- **"Implementation"**, when a designated NAP is in the phase of being tendered or implemented by a nominated contactor or by a public entity. This category also encompasses NAPs that are in the "test run".
- **"Planned"**, when there is trackable activity towards the implementation of a NAP, the planning of NAP architecture, the arrangement of organizational structure and responsibilities, or the preparation of studies and tenders. "In Progress" responses and statuses are addressed as falling into this category.
- **"Not implemented"**, when there is neither NAP implemented nor implementation plan in place.
- **"Not Operational"**, when a NAP has been implemented but is not fully operational (e.g., on-line accessible) or does not have any content to exchange.
- **"Not Applicable"**, when there is enough evidence to judge that data according to the DRs supplementing the ITS Directive (2010/40/EU) are not at all available, e.g., due to the absence of the required infrastructure. A typical example constitutes the absence of safe and secure parking areas within a specific MS that jeopardizes any possibility of a relevant NAP operation.

The acquired information is checked for consistency, with responses provided in previous surveys and the information/evidence collected by the European Commission[3]. Where necessary, extra clarification was requested from the respective NAPCORE project partner. Information for the previous years (2016-2022) originates from similar analyses conducted under the EU EIP project (which produced the so-called annual NAP reports[4]) as well as from the first and second versions of the current report. The URL links to access the NAPs and the NBs that are responsible for assessing the implementation of the ITS Directive per country are available in Annex I - National Access Points and

[3] https://transport.ec.europa.eu/transport-themes/intelligent-transport-systems/road/action-plan-and-directive/national-access-points_en

[4] https://www.its-platform.eu/achievement/monitoring-harmonisation-of-naps/

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Annex II - National Bodies. It should be noted that the accumulated knowledge on the NAP status across Europe has been used to update the reported status for the previous years (2016-2022). In that sense, the current version of this report should be addressed as repealing the previous one.

2.1.1. Status of NAPs for Safe and Secure Truck Parking

This section presents the progress and current status of implementation, per country, of the European NAPs with regard to the provision of information services for safe and secure parking places for trucks and commercial vehicles in line with the DR(EU) 885/2013 (in short 'NAPs for SSTP'). The DR (EU) 885/2013 was adopted by the EC on 18 September 2013 and applies (a) from 1 October 2015 to the provision of services already deployed on the date of entry into force of this DR and (b) from 1 October 2013 to the provision of services to be deployed after the date of entry into force of this DR.

The progress of the implementation of the DR (EU) 885/2013 is illustrated in Figure 1. In 2016 only 4 countries had an operational or partly operational NAP and another 3 had a planned NAP. In the following years there was a significant increase and in 2023 20 out of 30 countries appear to have an operational or partly operational NAP, while 3 countries have planned or are in the phase of implementation of a new platform/interface to act as a NAP for SSTP (LV, CH, and UK). Five out of the seven remaining countries (Portugal, Norway, Malta, Cyprus and Ireland) are considered to not operate safe and secure truck parking place since at the time of the survey, no such places exist. Therefore, the implementation status of these countries is classified as "Not Applicable". Finally, one country appears to not have yet implemented a NAP for SSTP (Lithuania), while the implemented platform/interface of another country is not fully operational (Slovakia). It is noteworthy that a lot of countries have chosen to use the European Access Point for Truck Parking Data as a technical interface for publishing SSTP-related data.

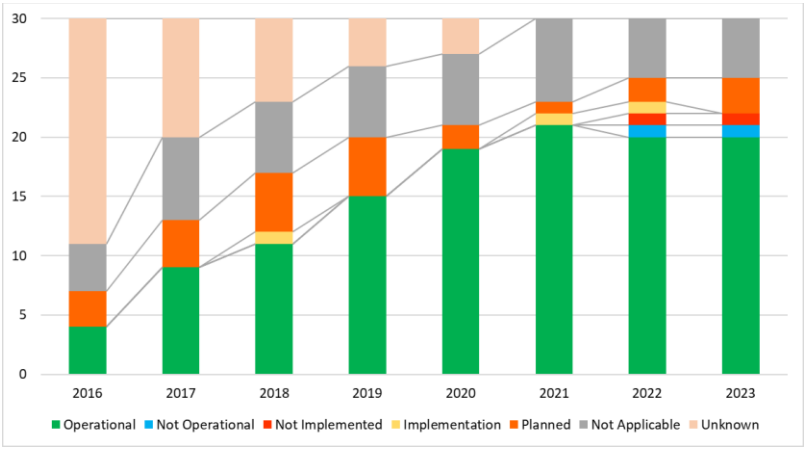

Figure 1: Implementation of DR (EU) 885/2013 – SSTP by the Member States

2.1.2. Status of NAPs for Safety-Related Traffic Information

This section describes the progress and current status of the European NAPs with regard to data and procedures for the provision of safety-related traffic information in line with the DR (EU) 886/2013 (in short 'NAPs for SRTI'). The DR (EU) 886/2013 was adopted by the EC on 18 September 2013 and applies from 1 October 2013.

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The progress of the implementation of the DR (EU) 886/2013 is illustrated in Figure 2. It can be observed that there was an increase from 7 countries in 2016 to 24 countries in 2023, regarding the countries that had an operational or partly operational NAP. In addition, there are: a) four countries (Latvia, Malta, Switzerland and United Kingdom) that have planned the development of a NAP for SRTI, and b) two countries that have developed a NAP for SRTI that is not currently fully operational (Cyprus and Slovakia). Overall, it seems that most European countries operate a NAP with regard to DR (EU) 886/2013.

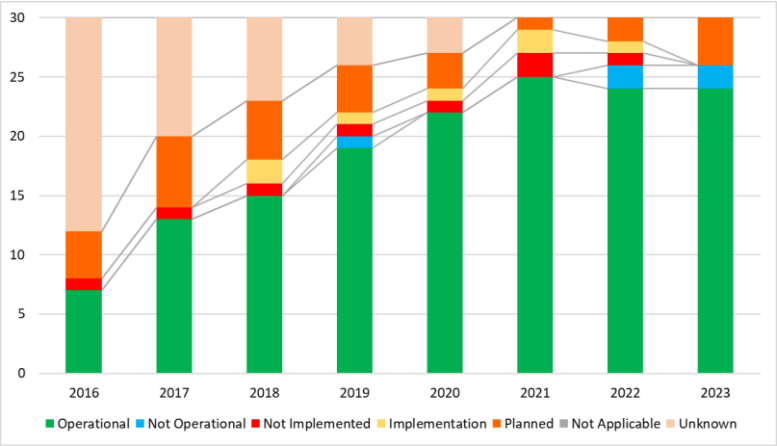

Figure 2: Implementation of DR (EU) 886/2013 – SRTI by the Member States

2.1.3. Status of NAPs for Real-Time Traffic Information

This section describes the current status of implementation of the European NAPs with regard to the provision of EU-wide real-time traffic information services in line with DR (EU) 2015/962 (in short 'NAPs for RRTI'). The DR (EU) 2015/962 was adopted by the EC on 23 June 2015 and applies from 13 July 2017. Recently, a new DR has been published as DR (EU) 2022/670 and comes into force from 1-1-2023 for Article 13, from 1-1-2025 for TERN, other motorways and primary road network and from 31-12-2027 for the coherent network..

The progress of the implementation of the DR (EU) 2015/962 is illustrated in Figure 3. It can be observed that there was a significant increase from 4 countries in 2016, to 25 countries in 2023, with an operational or implemented (partly operational) NAP. Moreover, there are: a) three countries (Latvia, Malta, and United Kingdom) that have planned the development of a NAP for RTTI, and b) two countries that have developed a NAP for RTTI that is not currently fully operational (Cyprus and Slovakia). Similar to SRTI, it appears that almost all European countries operate a NAP for RRTI.

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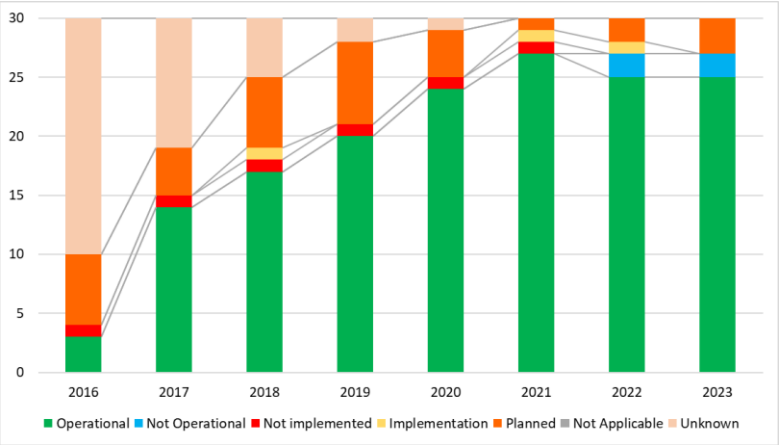

Figure 3: Implementation of DR (EU) 2015/962 – RTTI by the Member States

2.1.4. Status of NAPs for Multimodal Travel Information Services

This section describes the current status of implementation of the NAPs with regard to the provision of multimodal travel information services, in short 'NAP for MMTIS'. The DR (EU) 2017/1926 was adopted by the EC on 21 October 2017. The application of the DR (EU) 2017/1926 is divided into four separate timeframes. The first timeframe (1 December 2019) encompasses the provision of static travel and traffic data associated with the '1st Level of Service' for the comprehensive TEN-T network. The second timeframe (1 December 2020) encompasses the provision of static travel and traffic data associated with the '2nd Level of Service' for the comprehensive TEN-T network. The third timeframe (1 December 2020) encompasses the provision of static travel and traffic data associated with the '3rd Level of Service' for the comprehensive TEN-T network, while the fourth timeframe (1 December 2023) encompasses the provision of static travel and traffic data associated with all levels of service for the other parts of the Union transport network. It should be noted that no specific timeframe is set with regard to the provision of dynamic travel and traffic data. This DR is currently under revision, while the EC proposal is expected within 2023.

The progress of implementation of the DR (EU) 2017/1926 is illustrated in Figure 4. Ireland was the first country to provide MMTIS-related data early in 2016. Since then, there is a significant increase regarding the countries that have an operational or implemented (partly operational) NAP (24 countries in 2023). Moreover, five countries (Hungary, Latvia, Malta, Slovenia, and United Kingdom) have indicated their intention to develop a NAP by declaring that their status is "planned". For the remaining two countries (Romania and Poland), the former has developed a NAP for MMTIS that is not currently fully operational, while the latter appears to not have implemented NAP for MMTIS. It should be noted that for several countries a link is included in the list maintained by the EC; however, it appears that in certain cases this link leads to a platform that does not provide access to MMTIS-related datasets or to a governmental platform that may either serve as a temporary interface for MMTIS data or provide a wide range of data not necessarily related to ITS in general and MMTIS in particular (e.g., statistical data).

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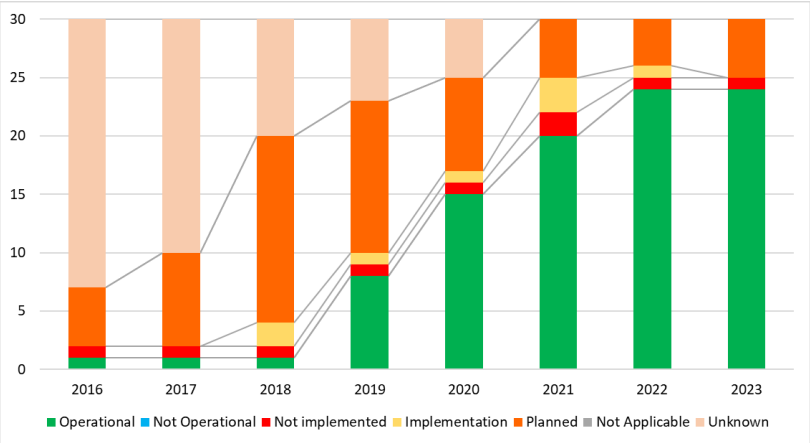

Figure 4: Implementation of DR (EU) 2017/1926 – MMTIS by the Member States

2.2. Monitoring data availability of European NAPs

Data availability monitoring of European NAPs is based on the categorization of the data elements specified in the annexes of the DRs supplementing the ITS Directive. In this respect, the third online survey designed in the context of Task 3.1 asks national responders to indicate whether their NAP exchange (or not) data in relation to each of the adopted data categories. It is noteworthy that all adopted categories for SSTP, SRTI, RTTI and MMTIS follow a similar categorization with the second survey.

With respect to **SSTP**, the following data categories are adopted:

- Data for the provision of **static** information about safe & secure truck parking areas (e.g., truck parking place location, parking capacity, access road identifiers)
- Data for the provision of **static** information about the safety conditions and equipment of safe & secure truck parking areas (e.g., description of security or service equipment)
- Data for the provision of **dynamic** information about the availability of safe and secure truck parking areas

With respect to **SRTI**, the following data category is adopted:

- Data for the provision of **dynamic** information about road safety-related events/conditions (e.g., location of event, category of event, provided driving behaviour advice)

With respect to **RRTI**, the following data categories are adopted:

- Data for the provision of **static** information about the road network (e.g., road network links and their physical attributes, road classification, speed limits)
- Data for the provision of **static** information about the usage of the road network (e.g., traffic circulation plans, freight delivery regulations)
- Data for the provision of **static** information about roadway and roadside infrastructure (e.g., location of tolling stations, location of parking places and service areas, location of public transport stops and interchange points)
- Data for the provision of **dynamic** road status information (e.g., road closures, lane closures, roadworks)

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- Data for the provision of **dynamic** traffic information (e.g., traffic volume, travel times, location, and length of traffic queues)

Finally, with respect to **MMTIS**, the following data categories are adopted:

- Data for the provision of **static** information for location search (e.g., address identifiers, topographic places, points of interest)
- Data for the provision of **static** information for location search – scheduled modes (e.g., identified access nodes, geometry/map layout structure of access nodes)
- Data for the provision of **static** information for location search – DRT services (e.g., location of stops/stations)
- Data for the provision of **static** trip plan information – scheduled modes (e.g., operational calendar, mapping day types to calendar dates)
- Data for the provision of **static** trip plan information – scheduled modes (e.g., fare network data, standard fare structures)
- Data for the provision of **static** auxiliary information – scheduled modes (e.g., vehicle facilities, such as classes of carriage, on-board Wi-Fi)
- Data for the provision of **static** trip plan information – cycling (e.g., detailed cycle network attributes, such as surface quality, side-by-side cycling, shared surface, on/off road, scenic route, 'walk only', turn/access restrictions)
- Data for the provision of **static** information for trip plan computation – scheduled modes (e.g., connection links between interchanges, transfer times, network topology, routes/lines topology, transport operators, timetables, planned interchanges, hours of operation, facilities of access nodes, etc.)
- Data for the provision of **static** information for trip plan computation – personal modes (e.g., network topology and attributes)
- Data for the provision of **static** information for trip plan computation – multimodal (e.g., estimated travel times by day type and time band by transport mode/combination of transport modes)
- Data for the provision of **static** information for detailed common standard and special fare queries – scheduled modes (e.g., passenger classes, common fare products, special fare products, basic commercial conditions)
- Data for the provision of **static** information for traveller services – scheduled modes (e.g., where and how to buy tickets, including retail channels, fulfilment methods and payment methods)
- Data for the provision of **static** information for traveller services – DRT modes (e.g., where and how to book, including retail channels, fulfilment methods and payment methods)
- Data for the provision of **static** information for traveller services – other mobility services and infrastructure (e.g., where and how to pay, including retail channels, fulfilment methods and payment methods)
- Data for the provision of **static** environmental information (e.g., parameters needed to calculate an environmental factor, such as carbon per vehicle/passenger mile, and parameters needed to calculate cost, such as fuel consumption)
- Data for the provision of **dynamic** passing time, trip plan, and operational information – scheduled modes (e.g., disruptions, real-time status, status of access nodes features, estimated departure and arrival times)
- Data for the provision of **dynamic** passing time, trip plan, and operational information – DRT modes (e.g., disruptions, real-time status)
- Data for the provision of **dynamic** information about current road link travel times
- Data for the provision of **dynamic** information about future predicted road link travel times

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- Data for the provision of **dynamic** information about cycling network status (e.g., closures, diversions)
- Data for the provision of **dynamic** information about the availability of mobility services and relevant infrastructure

Figure 5 - Figure 8 provide an aggregated picture of the number of countries publishing data per adopted data category. It should be noted that NAP status is considered in the information included in these figures (i.e., for this reason, no availability is reported for countries in which a NAP has not yet been operated or is in the process of a substantial technical update).

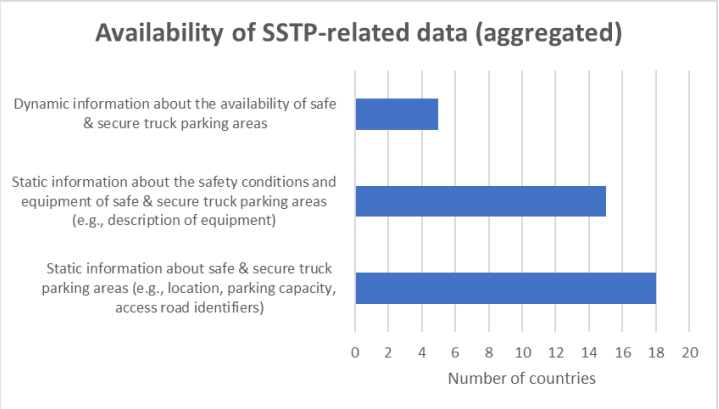

Figure 5: Availability of SSTP-related data (aggregated)

As it can be observed from Figure 5, there are only 5 countries that provide data with regard to the availability of safe and secure parking areas. On the other hand, for the remaining two data categories, which are related to the provision of static information, the countries that have relevant publications on their NAPs are much more. In particular, 15 countries provide data regarding the safety conditions and equipment of safe & secure truck parking areas, while 18 countries provide static data about the safe & secure truck parking areas.

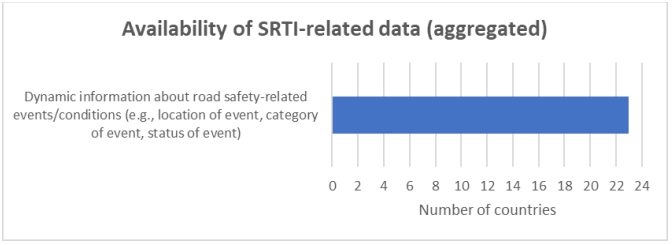

Figure 6: Availability of SRTI-related data (aggregated)

As it can be seen from Figure 6, 23 countries provide dynamic data about road safety-related events and conditions, while the remaining 7 countries do not provide such information through their NAP. This output does not come as a surprise since the current status of European NAPs with regard to DR (EU) 886/2013 seems to be consistent with the provision of safety-related traffic information. Specifically, the status of NAP of 6 out of 7 countries that do not publish SRTI data, is considered as planned, not operational, not implemented, or under implementation. This status justifies the lack of provision of SRTI-related data.

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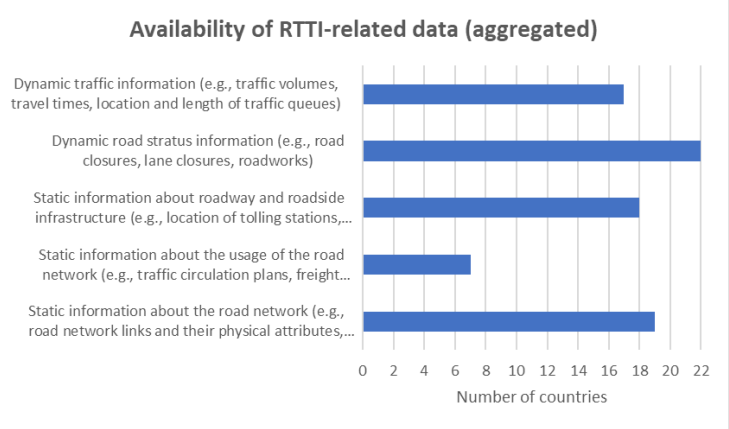

Figure 7: Availability of RTTI-related data (aggregated)

As it can observed in Figure 7, the number of countries that provide data about the road network and roadway and roadside infrastructure is 19 and 18, respectively. Furthermore, 22 countries provide dynamic data about road status, while 17 countries make available dynamic data with regard to prevailing traffic (flow) conditions. Static information about the usage of the road network is less available, with only 7 countries providing relevant data through their NAP. This is to a certain extent anticipated since traffic circulation plans and freight delivery regulations constitute two challenging data elements/ontologies of the RRTI Delegated Regulation (in terms of providing a harmonious and easy to follow/apply definition).

Finally, as it can be seen in Figure 8, there is an observable discrepancy regarding which types of MMTIS data are made available through the European NAPs. In particular, certain data categories, such as static information for location search, static information for trip plan computation, and static trip plan information are fairly covered by the European NAPs (at least by 7 to 19 NAPs depending on the applicable transport mode). On the other hand, there are data categories for which only a few countries provide data through their NAP. For instance, 5 countries (Belgium, Finland, France, Germany, and Norway) provide static information as regards the provision of traveller services in DRT modes, 4 countries (Austria, Belgium, France, and the Netherlands) provide static environmental information, 2 countries (Luxembourg and the Netherlands) provide dynamic information about the cycling network status, and only 1 country (Austria) makes available future predicted road link travel times.

Compared to the deadlines set by the DR, delays can be observed especially for some static data under the level of service 1 (LOS 1), which was expected to be provided by the end of 2019. However, the published information in several countries might concern already the urban network which is a requirement for a later stage of implementation. This fact can be expected as in MMTIS the required information is very rich, concerns all modes (some of them relevant only for urban network), and needs to be collected by many different operators, from different mobility sectors.

In comparison to the previous report, now, some MSs have reported reduced data availability in specific data categories. This might appear counterintuitive at first glance, given the expectation of NAPs' progress over time, however, this shift can be attributed to the fact that certain MSs were in the midst of transitioning to new NAP platforms. Thus, as they shifted to the new NAP platforms, temporary disruptions occurred, resulting in a temporary reduction in data availability.

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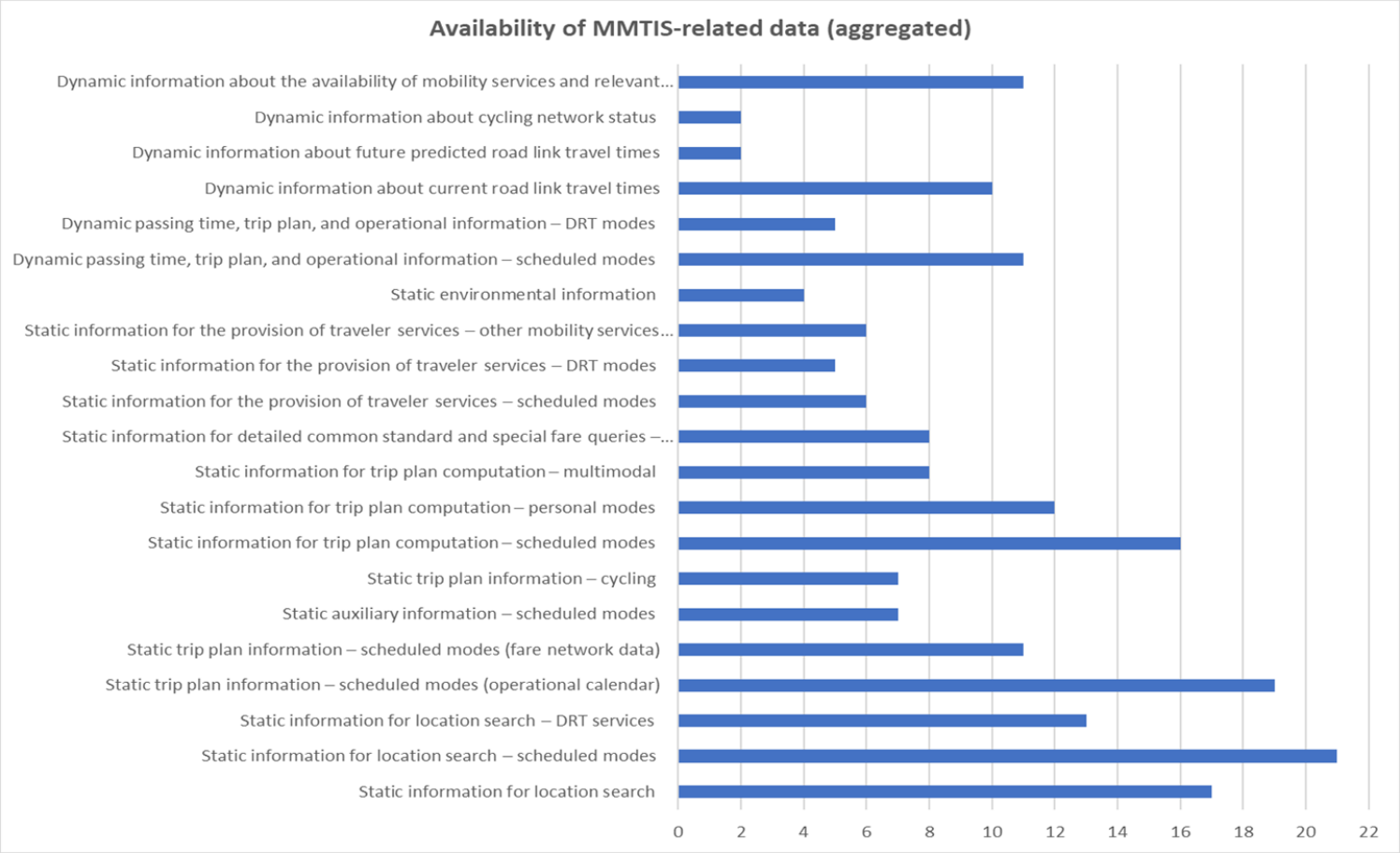

Figure 8: Availability of MMTIS-related data (aggregated)

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3. Common formats and standards

This chapter provides an overview of the standards implemented in accordance with each of the DRs supplementing the ITS Directive (2010/40/EU). In particular, it presents in an aggregated manner the main findings of the part of the survey targeting this topic.

It is important to note that the information requested by the survey is based on the data elements as mentioned exactly in the Annexes of each of the DRs supplementing the ITS Directive (2010/40/EU). Responders were asked to indicate the utilized data standard or technical format for each data element, but also the utilized location referencing method. Important to note is the distinction between data standards and technical formats. The former refers to a way of structuring the data following predefined fields and rules, while the latter expresses a way of conveying the data.

It is also important to mention that provided information encompasses NAPs implemented as databases or both metadata repositories and databases (see Chapter 4).

3.1. Standards implemented for SSTP

For SSTP, the DR recommends using the DATEX II data standard. Figure 9, Figure 10, Figure 11, Figure 12 present 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, contact information of the operators of safe and secure truck parking places, and dynamic information about the availability of safe and secure truck parking places, respectively. As it can be observed in Figure 9 and Figure 10, DATEX II remains the mainly used standard for the exchange of static information (around 90% of SSTP datasets conform to DATEX II). However, there are also other data formats in use, such as WFS, XLSX, and SHP. Contact information of the operators of safe and secure truck parking places appears to be exchanged using also other data formats than that of the DATEX II standard, such as XLSX, text, or ODS formats, as depicted in Figure 10. With regard to the exchange of dynamic information about the availability of safe and secure truck parking places DATEX II is not the only dominant standard (as stated in the previous report); some MSs mentioned the utilization of other standards for exchanging that kind of information through their NAP. In any case, the number of countries that responded to the questionnaire was still quite limited. Nevertheless, it could not be expected to receive more responses, given the low availability of relevant datasets in European NAPs.

Figure 13 presents the utilized methods for encoding point and linear location information. In the case of point location, coordinates are the most widely utilized method, while the linear along linear elements method is the primarily utilized for linear location information.

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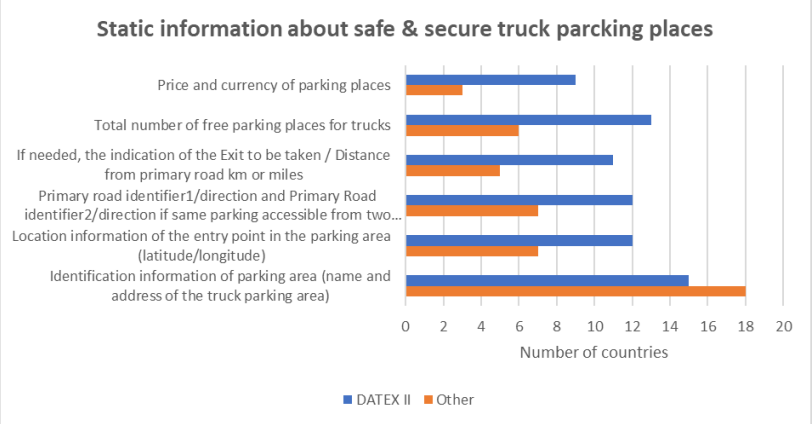

Figure 9: Data standards and formats used for the exchange of static information about safe and secure truck parking places

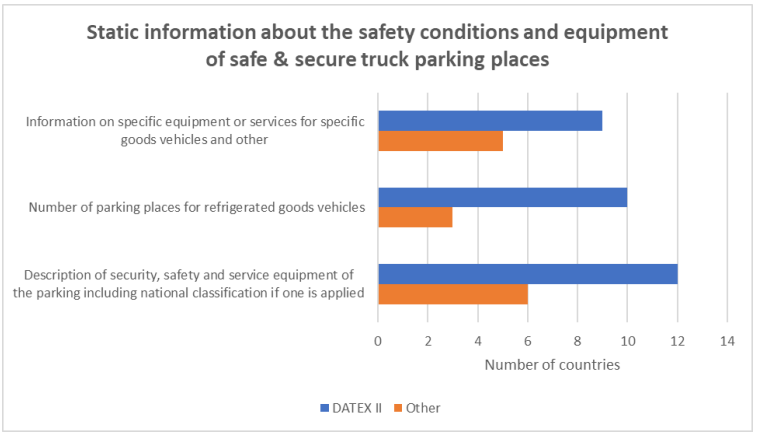

Figure 10: Data standards and formats used for the exchange of static information about the safety conditions and equipment of safe and secure truck parking places

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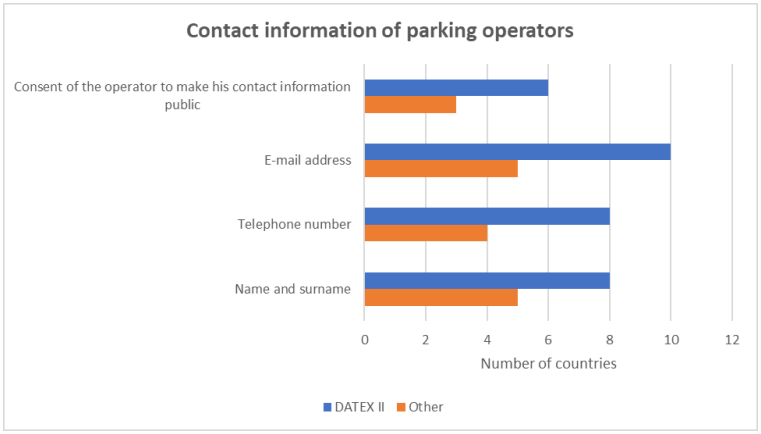

Figure 11: Data standards and formats used for the exchange of contact information of the operators of safe and secure truck parking places

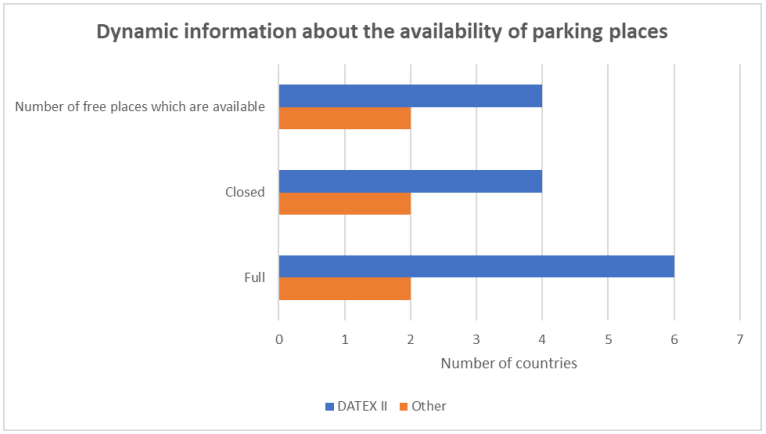

Figure 12: Data standards and formats used for the exchange of dynamic information about the availability of safe and secure truck parking places

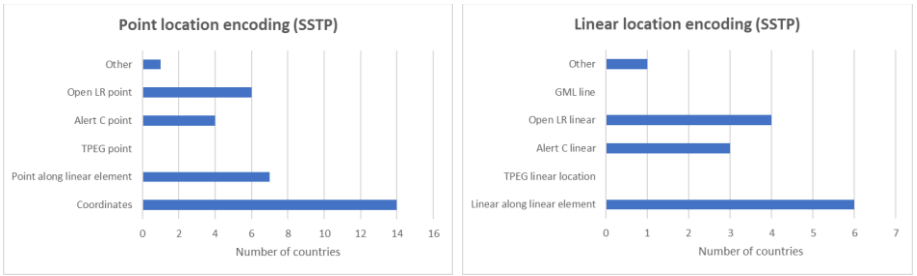

Figure 13: Location referencing methods used for the exchange of SSTP-related information

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3.2. Standards implemented for SRTI

For SRTI DR, the recommended data standard is DATEX II as well. Figure 14 presents the data standards used for the exchange of dynamic information about road safety-related events/conditions. As it can be easily observed, almost all countries that have relevant publications in their NAP use DATEX II for this purpose. However, some countries also adopt alternative formats such as JSON, GeoJSON, RSS, GeoRSS, XML, and OSM for similar purposes.

Figure 15 presents the utilized methods for encoding point, linear, and area location information. The encoding of point locations is accomplished through various methods with the most widely utilized methods being coordinates, Alert C point, Open LR point and point along linear element. Linear location encoding is executed through several methods, with the most prevalent ones being Alert C linear, linear along linear element, and Open LR linear. Finally, the encoding of area locations is mainly accomplished through the Alert C area method, as illustrated in Figure 15.

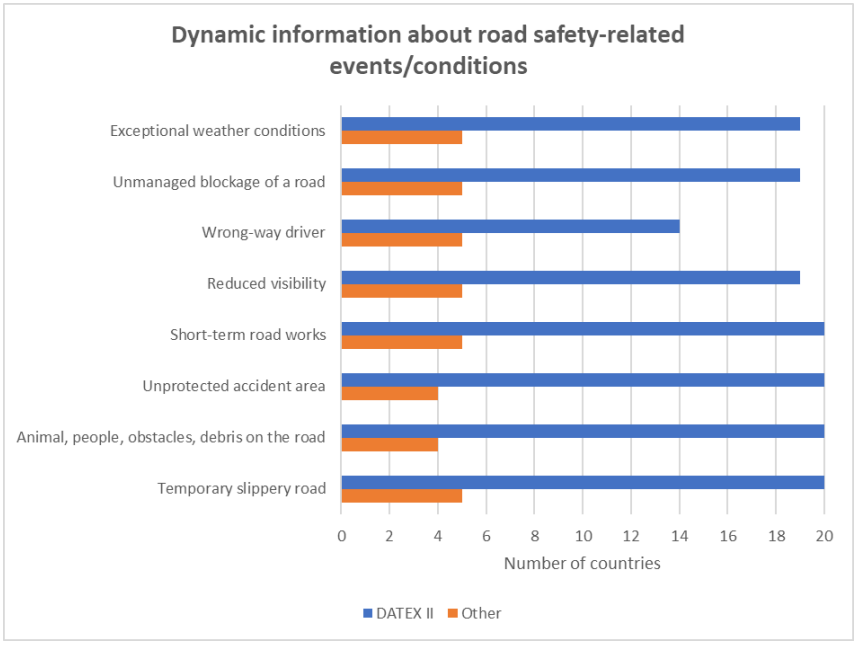

Figure 14: Data standards and formats used for the exchange of dynamic information about road safety-related events/conditions

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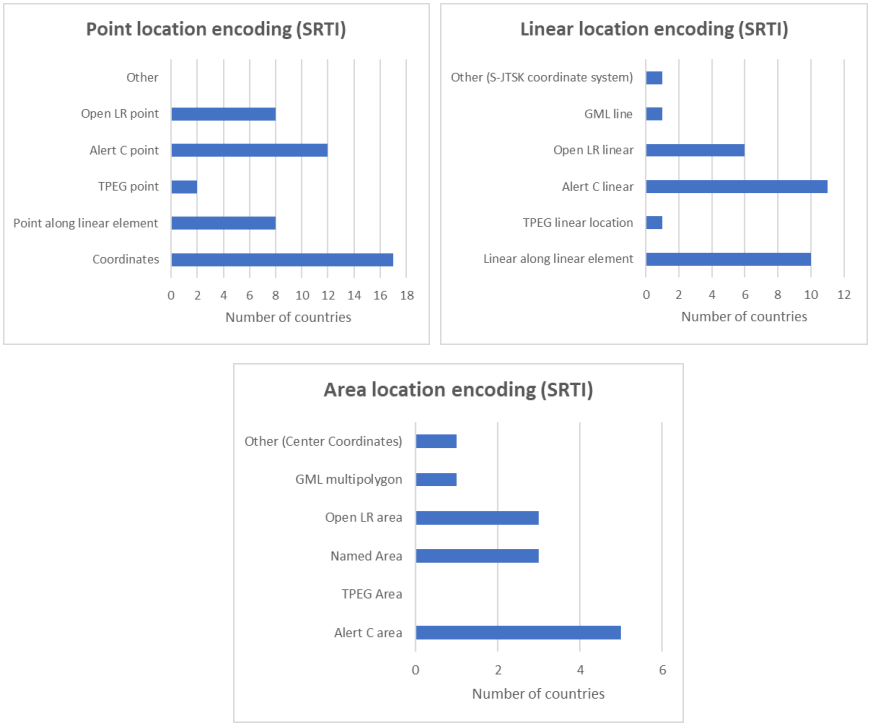

Figure 15: Location referencing methods used for the exchange of SRTI-related information

3.3. Standards implemented for RTTI

Figure 16, Figure 17 and Figure 18, present the data standards used for the exchange of static information about the road network, its usage, and roadway/roadside infrastructure, dynamic road status information, and dynamic road traffic information, respectively. As regards the exchange of static information about the road network, its usage, and roadway/roadside infrastructure, the "other" category emerged as the most frequently chosen option by countries, encompassing a diverse range of formats such as SHX, SHP, PRL, DBF, CPG, JSON, GeoJSON, CSV, XML, as well as national standards like Elveg and NVDB. However, when it comes to certain data elements like the location of parking places and service areas, DATEX II seems to be a widely utilized standard. Additionally, for data elements such as geometry and road classification, WMS/ WFS is also extensively used. Finally, fewer countries have indicated the use of the TN-ITS standard, particularly for speed limits and traffic regulations. Concerning the exchange for dynamic road status information, DATEX II is the dominant used data standard as it can be seen in Figure 17. It is important to distinguish between the method of structuring data, such as DATEX II, and the technical formats used for conveying data. Examples of these technical formats constitute (DDR) XML, JSON, GeoJSON, RSS, GeoRSS, OSM and CSV. As regards the exchange of dynamic road traffic information, the picture is pretty similar to the exchange of dynamic road status information, with DATEX II standing out as the predominant data standard.

Figure 19 presents the utilized methods for encoding point, linear, and area location information. The most prominent methods used for encoding point locations are coordinates, Alert C point, point along linear element, and Open LR point. The encoding of linear locations, on the other hand, is mainly based on liner along linear element, Alert C linear, and Open LR linear methods. Finally, the encoding of area

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locations appears to be mainly accomplished through the Alert C area method. However, a significant number of countries have mentioned the Open LR and named area method as well. None of the countries though has mentioned the use of TPEG Area methods.

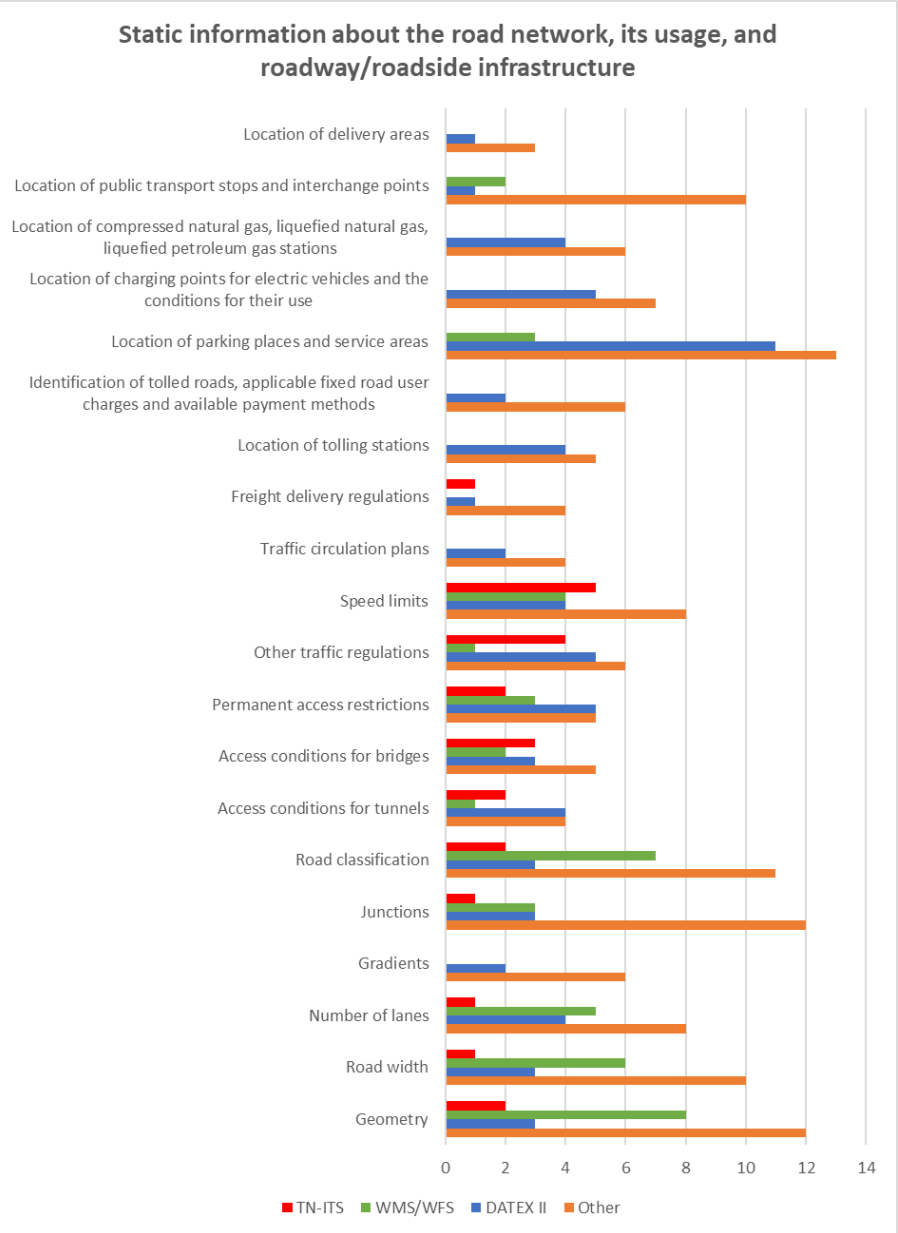

Figure 16: Data standards and formats used for the exchange of static information about the road network, its usage, and roadway/roadside infrastructure

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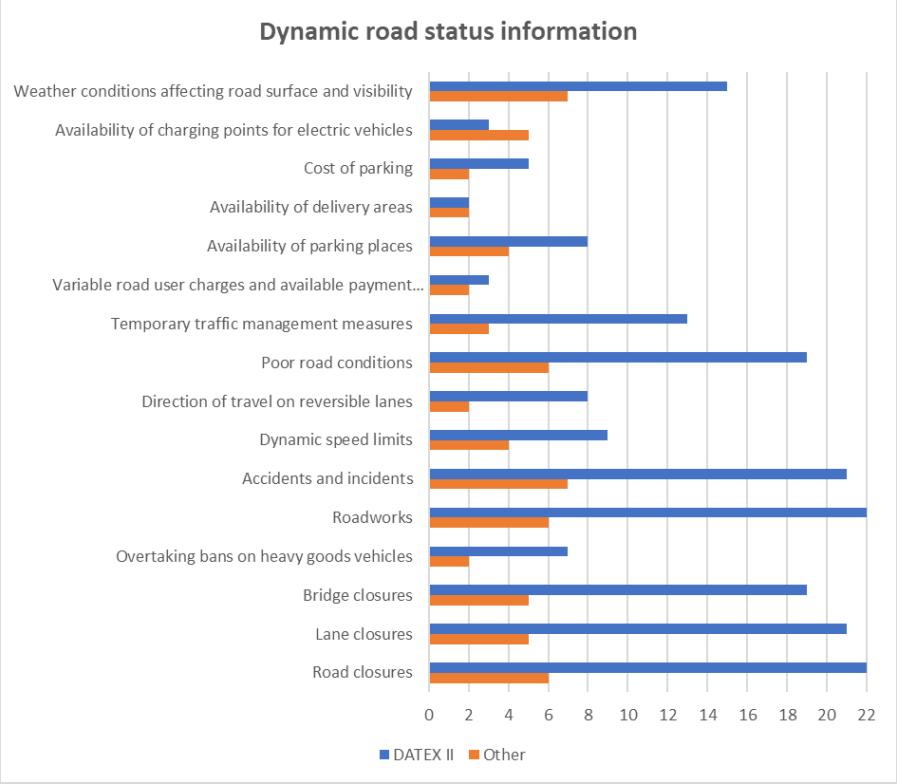

Figure 17: Data standards and formats used for the exchange of dynamic road status information

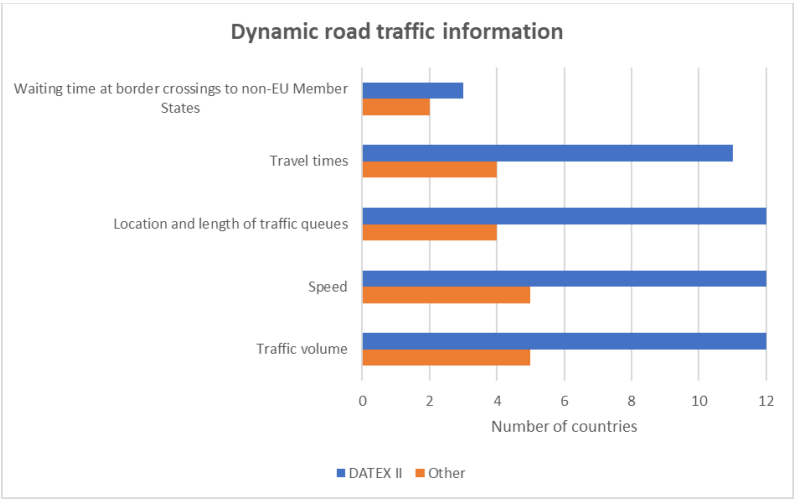

Figure 18: Data standards and formats used for the exchange of dynamic road traffic information

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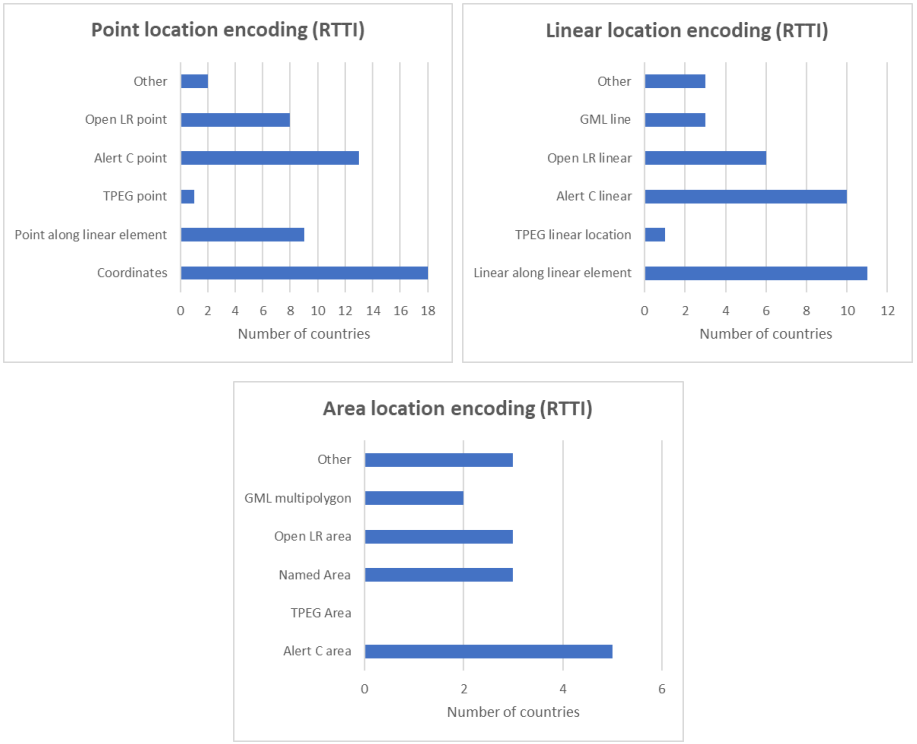

Figure 19: Location referencing methods used for the exchange of RTTI-related information

3.4. Standards implemented for MMTIS

Figure 20, Figure 21, Figure 22, Figure 23, Figure 24, Figure 25, Figure 26, Figure 27, and Figure 28 present the data standards used for the exchange of static and dynamic information related to MMTIS. A significant observation in most data categories falling under the MMTIS DR is that the number of countries, which exchange relevant information through their NAP, is quite low. Therefore, the majority of countries have mentioned either that the specific data category is not applicable, or that they have no standards implemented for that data category. In addition, many countries declared the use of "other standards" without providing concrete examples. However, it is worth mentioning that in specific data categories, countries are indicating the use of different data standards and formats. In particular, for the exchange of static information supporting location search services, four countries mentioned the use of NeTEx and six the use of INSPIRE. These countries are Germany, Romania, Italy, Luxemburg, and Norway in relation to NeTEx and Belgium, Denmark, Luxemburg, Romania, Norway and Portugal in relation to INSPIRE. As regards the exchange of static information supporting detailed common standard and special fare querying services, specific data standards, such as NeTEx, GBFS, and IJPP have been mentioned. In addition, many other technical formats have been referenced as well, including, JDF, and XLS. As regards the exchange of static information for traveller services, many data standards are indicated including DATEX II, GBFS, and NeTEx. MSs have also specified the use of technical formats, such as CSV and XLS upon which the data standards rely. As regards the exchange of static information for trip plans, the most dominant data standard is NeTEx used by nine countries. Nevertheless, it is only associated with the data element which is the operational calendar. As regards the exchange of auxiliary static information for trip plans and availability check, the specific data

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standard mentioned is NeTEx, NRP, GTFS and SHP. As regards the exchange of static information for trip plan computation (scheduled modes of transport and road transport), specific data standards have been mentioned including NeTEx, GTFS, INSPIRE, OSM, SHP, JDF, XLS, and NVDB. Finally, as regards the exchange of dynamic MMTIS-related information, DATEX II, SIRI, GTFS-RT, NVDB, and BISON are the relevant data standards, while JSON serve as relevant technical format.

Figure 29 presents the utilized methods for encoding point, linear, and area location information. The most prominent methods used for encoding point locations are, in ascending order, coordinates, Alert C, point along linear and open LR elements. On the other hand, the encoding of linear locations is mainly accomplished through the linear along linear element method, but also through the Alert C linear and GML line method. Finally, the encoding of area locations is accomplished through varying methods, including Alert C area, GML polygons, and Named Area.

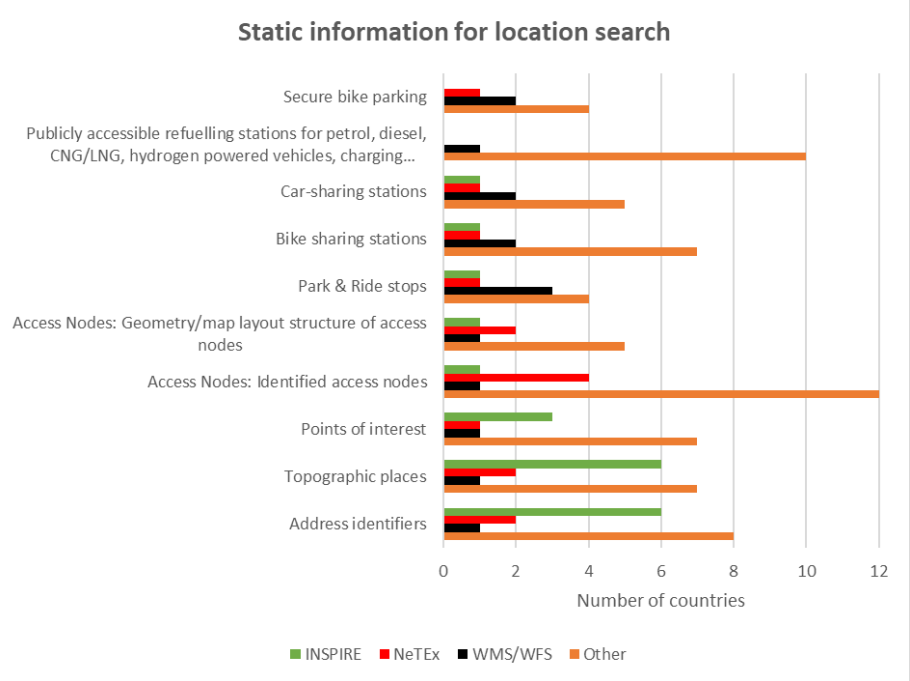

Figure 20: Data standards and formats used for the exchange of static information for "location search"

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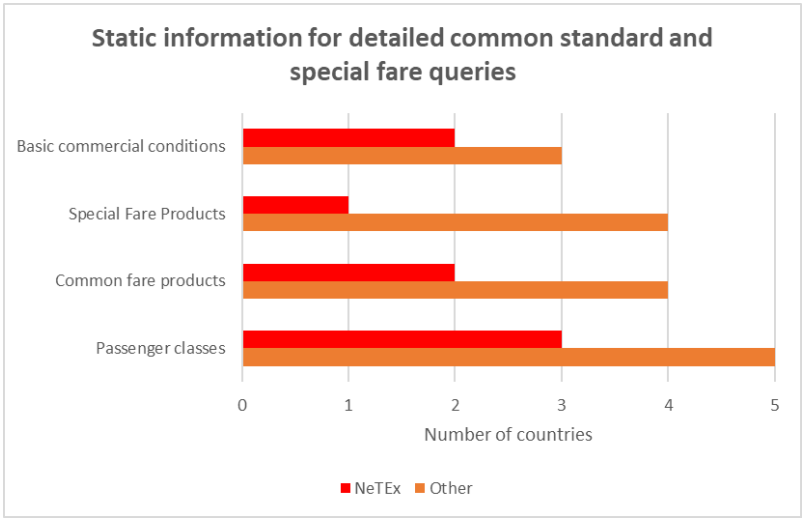

Figure 21: Data standards and formats used for the exchange of static information for "detailed common standard and special fare queries"

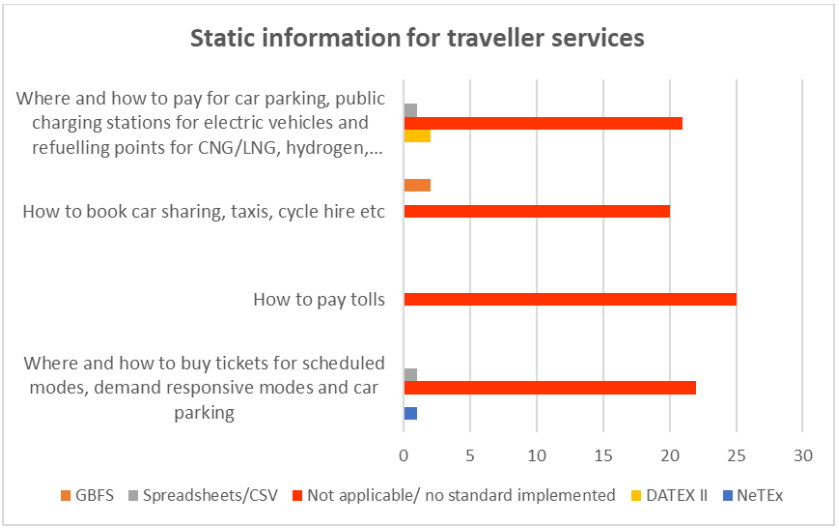

Figure 22: Data standards and formats used for the exchange of static information for "traveller services"

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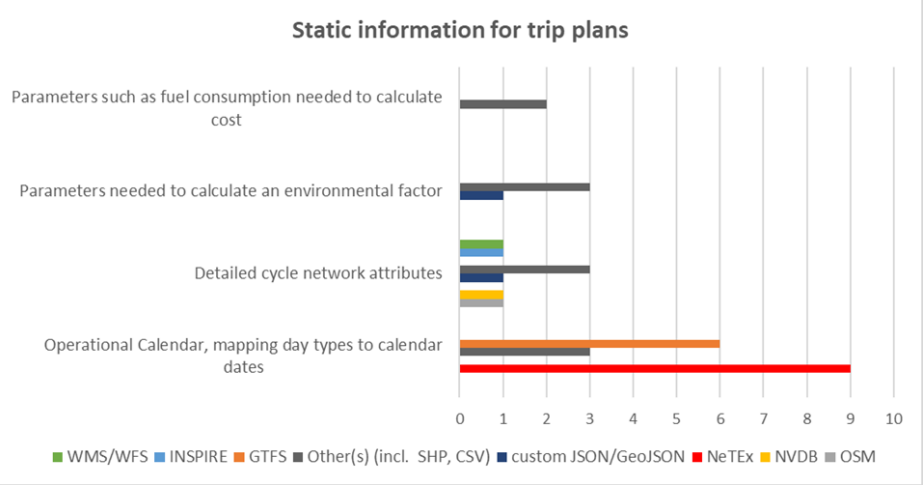

Figure 23: Data standards and formats used for the exchange of static information for "trip plans"

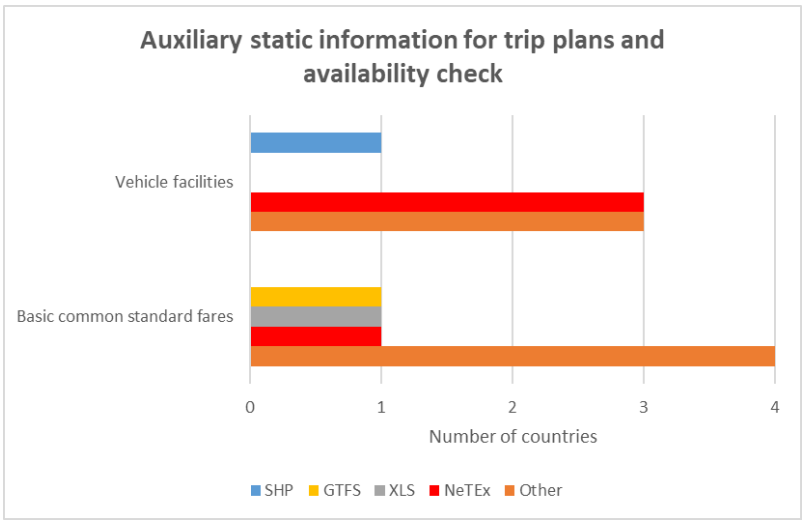

Figure 24: Data standards and formats used for the exchange of auxiliary static information for "trip plans and availability check"

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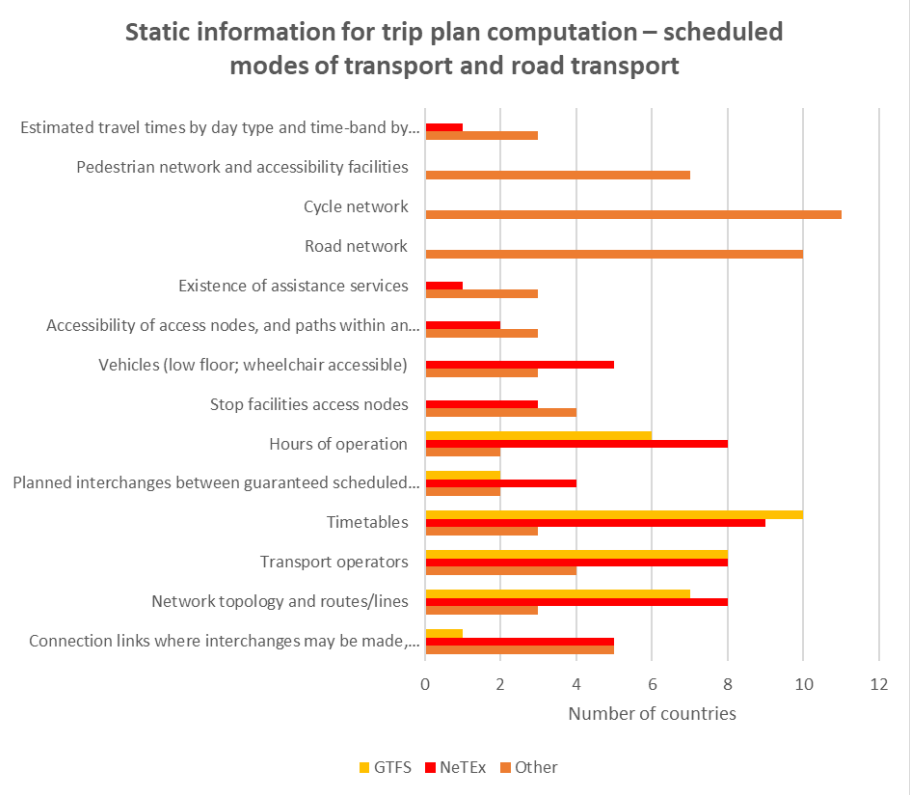

Figure 25: Data standards and formats used for the exchange of static information for "trip plan computation – scheduled modes of transport and road transport

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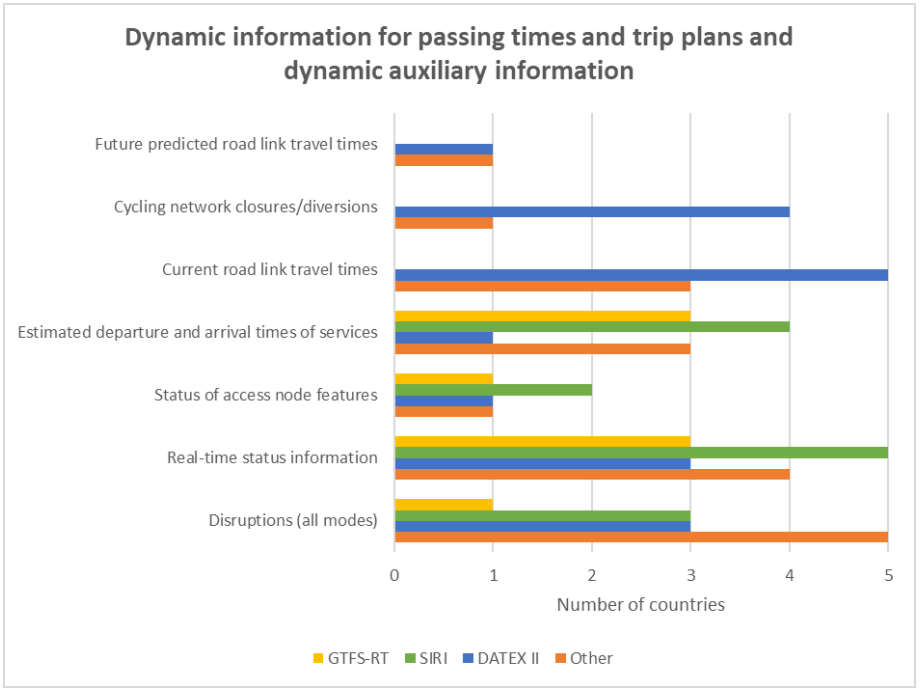

Figure 26: Data standards and formats used for the exchange of dynamic information for "passing times and trip plans" and dynamic auxiliary information

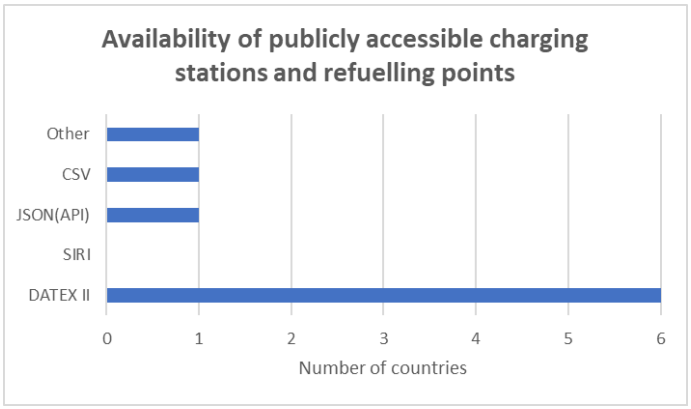

Figure 27: Data standards and formats used for the exchange of dynamic information for the "availability of publicly accessible charging stations and refuelling points"

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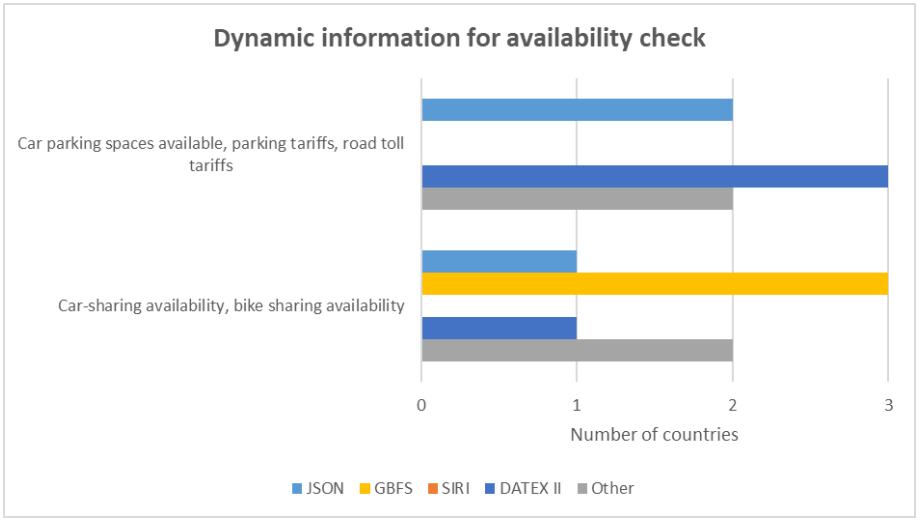

Figure 28: Data standards and formats used for the exchange of dynamic information for availability check

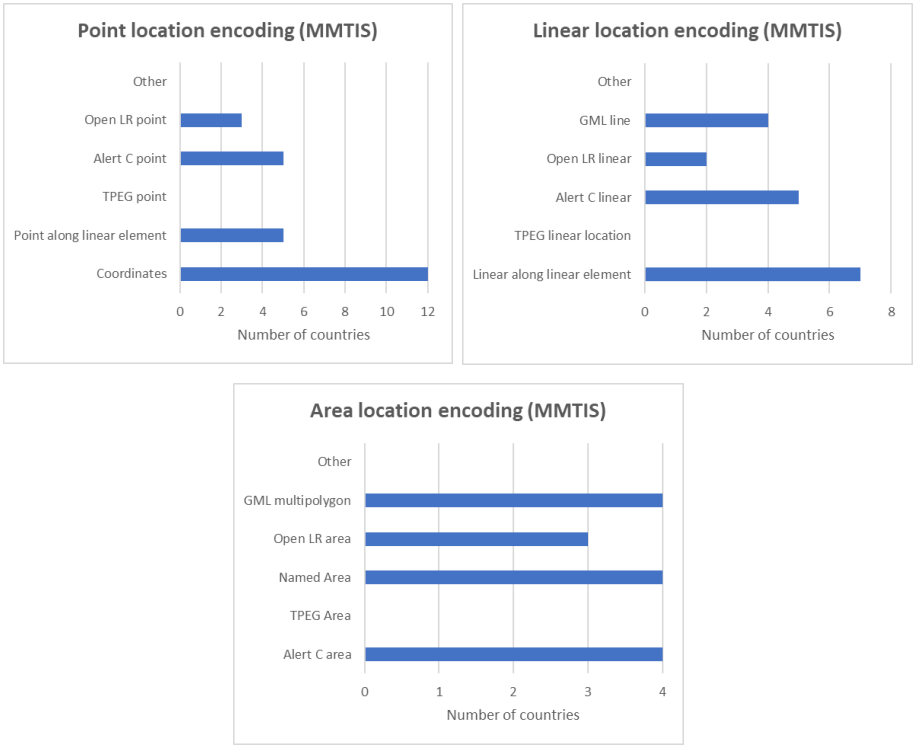

Figure 29: Location referencing methods used for the exchange of MMTIS-related information

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4. Additional survey results

This chapter provides insight into the outcomes of the remaining parts of the executed survey. Provided information encompasses types of NAPs, data licensing, and compliance assessment.

4.1. Types of NAPs, metadata and discovery services

The survey includes an examination of NAPs classified by their architecture, either as a database, web-link, or a combination of both. These types of architectures were defined in the EU EIP project and we decided to keep them to ensure consistency and compatibility with the results of the NAP monitoring surveys carried out before NAPCORE. This allows for a straightforward analysis of the evolution of the NAPS. However, once the work in NAPCORE on NAP architectures is finalised, we will change the survey to match the newly defined architecture types. A database or data broker NAP serves as a central hub for uploading, downloading, and/or accessing data through an API. Conversely, a web-link or metadata repository NAP offers metadata descriptions and links to published datasets hosted on external platforms, functioning as a decentralized data platform without participating actively in the data exchange between providers and consumers.

The survey also raises the issue of metadata and data discovery services availability, which is mandated by the Delegated Regulations supplementing the ITS Directive. According to this requirement, NAPs are expected to facilitate the search and retrieval of relevant information through the provision of well-defined metadata and data discovery services.

This report aims to provide a more comprehensive perspective through a thorough analysis of each country's response to each DR individually. In this way, we can efficiently analyse how NAP types, metadata, and discovery services are divided both among the Delegated Regulations and among the participating countries in this project.

Besides the options to indicate the type of NAP or to select Yes/No regarding the availability of discovery services and metadata, in the questionnaire there was also the possibility to answer with “not applicable” or “will be implemented in …. months”. The former is meant for the situation when there is no operational NAP while the latter indicates that the feature (metadata or discovery services) is not available but there are plans to implement it within a given timeframe.

By examining the response of each country to each Delegated Regulation, this report offers a detailed analysis of how NAP types, metadata, and discovery services are distributed and utilized in the participating countries.

This is the reason why sub-chapter 4.1 is divided further into four sub-chapters, each dedicated to one of the Delegated Regulations: SSTP, SRTI, RTTI, and MMTIS. In each of these sub-chapters, the functional NAP type in each country will be explained, as well as the availability of metadata and discovery services for each country. Additionally, the sub-chapters 4.2 to 4.3 will examine the licensing conditions in each country and the level of implementation for compliance assessment.

4.1.1. Status for SSTP

The results regarding NAPs for SSTP presented in Figure 30 - Figure 32 show that about a third are purely web-link type while another third is only database type. There are 8 answers “not applicable” which is much higher than the other DR, but it is expected since many countries chose to provide information through the European Access Point for Truck Parking Data and not develop a national platform/technical interface. The situation regarding metadata and discovery services is good considering that both are implemented by 16 of the 22 countries where a NAP is available (operational or even planned).

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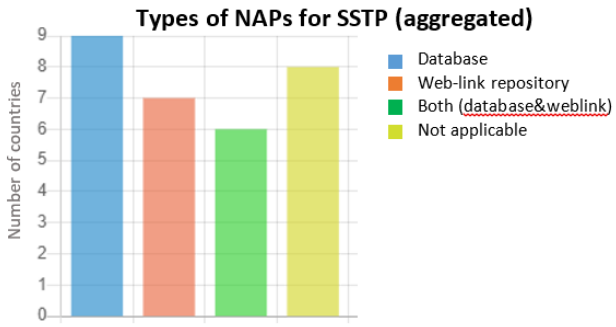

Figure 30: Types of NAPS for SSTP (aggregated)

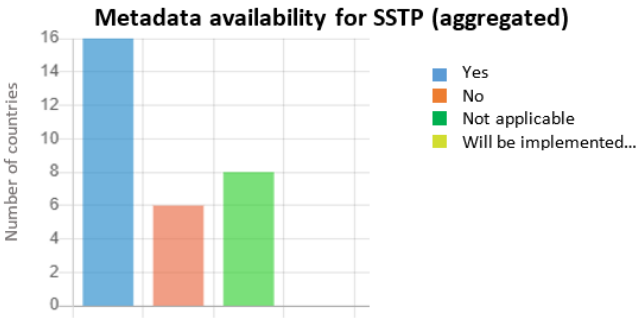

Figure 31: Metadata availability for SSTP (aggregated)

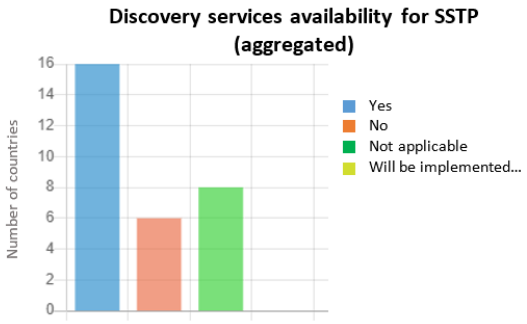

Figure 32: Discovery services availability for SSTP (aggregated)

4.1.2. Status for SRTI

The results regarding NAPs for SRTI presented in Figure 33 – Figure 35 show that almost half (12) are purely web-link type, about a third are purely database type, and only six are mixed type. The situation regarding metadata and discovery services is good, as metadata is implemented in 18 NAPs and discovery services are available also in 18 NAPs.

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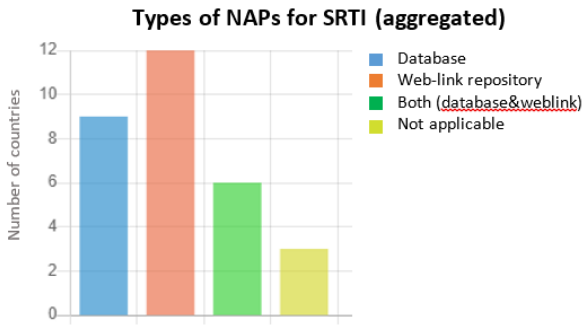

Figure 33: Types of NAPS for SRTI (aggregated)

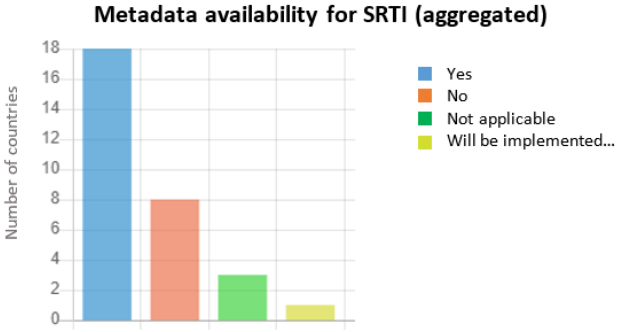

Figure 34: Metadata availability for SRTI (aggregated)

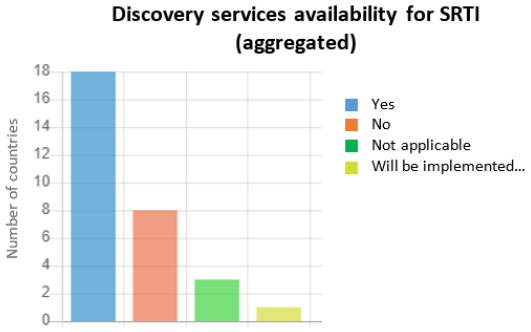

Figure 35: Discovery services for SRTI (aggregated)

4.1.3. Status for RTTI

The results regarding NAPs for RTTI presented in Figure 36 – Figure 38 show that a bit more than a third (12) are purely web-link type, a third are purely database type, and only six are mixed type. Only six countries do not have metadata, and the situation regarding discovery services is good as it is implemented in 19 countries.

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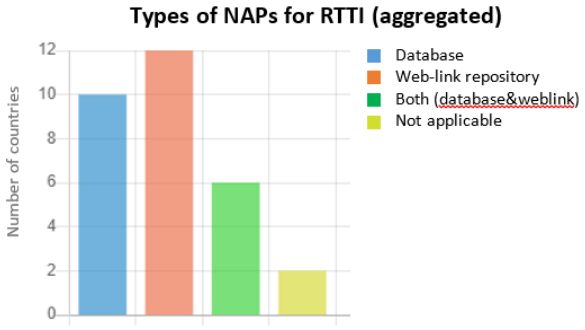

Figure 36: Types of NAPS for RTTI (aggregated)

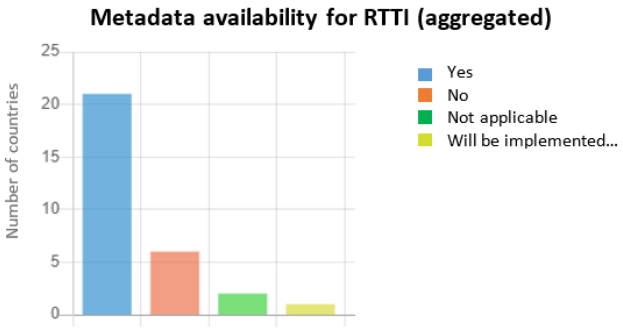

Figure 37: Metadata availability for RTTI (aggregated)

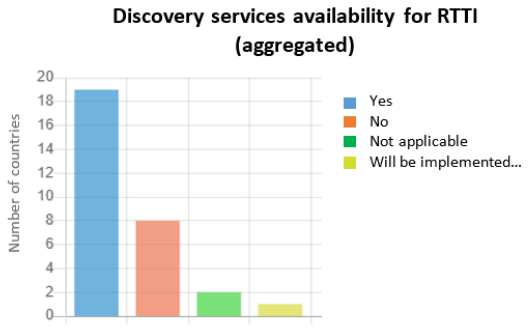

Figure 38: Discovery services availability for RTTI (aggregated)

4.1.4. Status for MMTIS

The results regarding NAPs for MMTIS presented in Figure 39 - Figure 41 show that most of them (13) are purely web-link type while only four are purely database type. This is consistent with previous findings, and it is a result of the very complex and varied MMTIS dataset which makes it very difficult to store all the information in a single common database. The situation regarding metadata and discovery services is good: 19 NAPs have metadata and implement discovery services.

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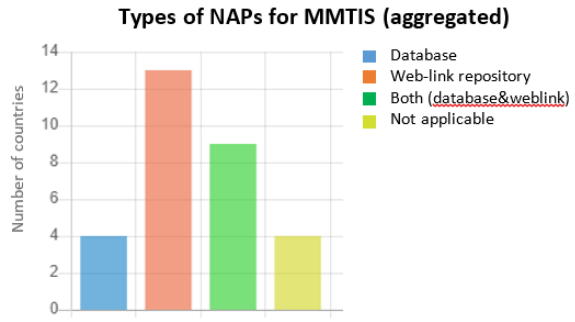

Figure 39: Types of NAPS for MMTIS (aggregated)

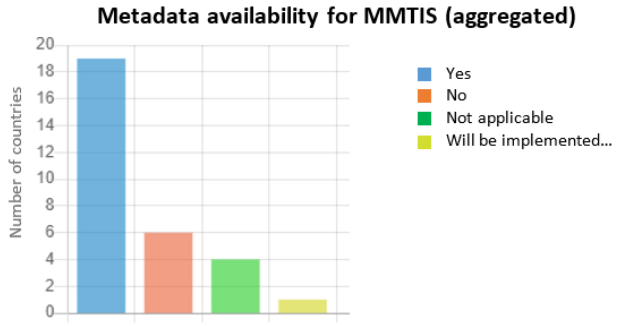

Figure 40: Metadata availability for MMTIS (aggregated)

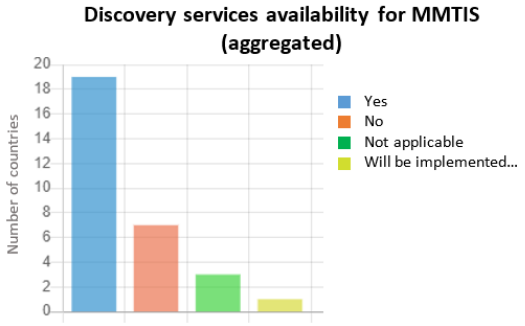

Figure 41: Discovery services availability for MMTIS (aggregated)

4.2. Data licenses and contracts

Both licenses and contracts set a reference basis that describes in an accurate manner the terms and conditions under which data can be shared and re-used with/by parties other than their provider. In other words, both data licenses and contracts operate as a mechanism to protect the data that is being

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exchanged. The crucial difference between data exchange licenses and data exchange contracts is that the latter should be signed by the data consumers or subscribers to data exchange interfaces.

Taking into consideration the observed trend for open data as well as the usefulness of open data for the enlargement of the ITS ecosystem, a part of the executed survey sought to acquire information about the amount of open data that is exchanged through NAPs. Figure 42 indicates the frequency of estimated percentage ranges.

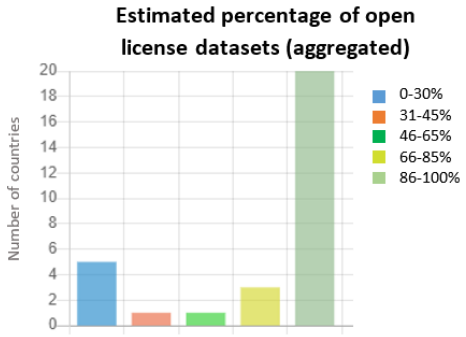

Figure 42: Frequency of answers concerning the estimated percentage of open license datasets

Beyond the estimated percentage of data that is exchanged under an open license, another part of the executed survey sought to collect information about the datasets based on commonly used standards per country. This is done for two main reasons. Firstly, to understand the extent to which NAPs promote the harmonized provision of terms and conditions for data reuse and, secondly, to gain insight into whether national or universal licensing frameworks are utilized by data providers across Europe. In Figure 43 it is possible to see that the distribution in the percentages changes greatly with respect to the one in Figure 42, but still almost one third of the countries show percentages between 86-100%.

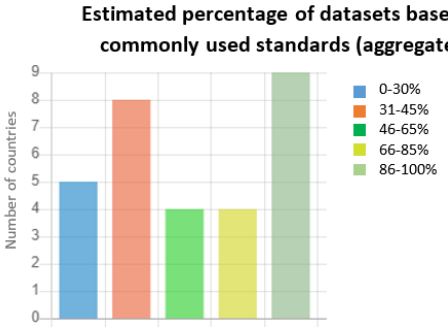

Figure 43: Frequency of answers concerning the estimated datasets based on commonly used standards

As it can be observed in both figures, the vast majority of data that is exchanged through NAPs does so under an open license.

4.3. Compliance assessment

Member States are obligated to assess the compliance of road/transport operators, road/transport authorities, service providers, and other actors involved in the ITS ecosystem or providing data through NAPs against the requirements set out in the Delegated Regulations supplementing the ITS Directive.

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This responsibility does not lie with NAPs or NAP operators but with authorities designated as competent by each Member State, as per these Delegated Regulations. Based on the contributions and proposals from the EU EIP, TISA, and ESPORG, this compliance assessment process can be broadly divided into two steps. The first step consists of the submission of self-declarations by the aforementioned actors, and the second step involves the assessment of these self-declaration forms by the competent authorities. The extent to which this process is carried out for each NAP dataset may serve as a data quality indicator and a relevant metadata field.

The survey aimed to investigate the number of datasets for which a self-declaration form has been submitted, as well as the number of datasets for which a compliance assessment process has been completed. This is because the compliance assessment is not the responsibility of NAPs or NAP operators, as mentioned before. The results of the survey are displayed in the following figures. As it can be observed in Figure 44, a self-declaration has been submitted for a limited number of datasets. A bit more than half (16) of the answers contained the first level of percentage (0-30%), there was just one answer between 31-45%, 3 answers were about 46-65%, two answers were 66-85% and the rest (7 answers) pointed to the interval of 86-100%.

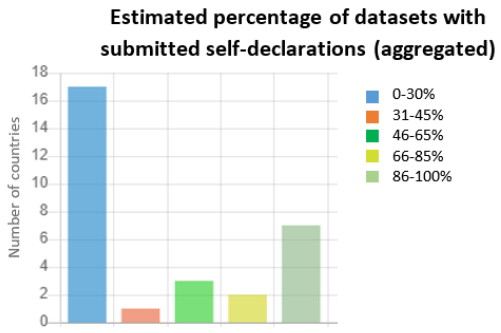

Figure 44: Estimated datasets with submitted self-declarations (aggregated)

The situation is similar when considering datasets undergone compliance assessment (Figure 45). More than half (20) of the countries are indicating the interval of 0-30% while only 5 countries are answering with the highest level (86-100%). In between, 2 countries pointed to the interval of 31-45%, another 2 countries pointed to the interval of 46-65%, and 1 country with 66-85%. Given the difficulty of compliance assessment for the ITS ecosystem (including National Bodies or other competent authorities), another NAPCORE Working Group will be dedicated to exploring this topic further.

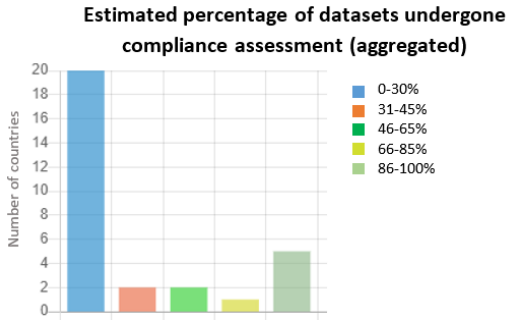

Figure 45: Datasets undergone compliance assessment (aggregated)

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5. Concluding remarks

This report presents the results of a NAPCORE survey, carried out during the third semester of 2023, and research regarding the status of NAPs implementation in Europe, organized as part of the activities of Task 3.1 of WG3. This work continues the legacy of similar endeavours carried out in the context of EIP+ and EU EIP projects. It also relies on the methodology and experience from the second iteration of data collection carried out in 2022. However, certain survey aspects have been omitted from this report since this version is meant, on the one hand, to provide a quick update on NAP status and data availability and, on the other hand, to kick-off the development of an efficient mechanism for gathering the input of national responders towards the development of an on-line NAP monitoring tool.

5.1. Brief report summary

The survey was completed by responsible ministries, NAP operators, National Bodies, and/or other relevant actors participating in NAPCORE or who have been contacted by NAPCORE partners. The survey has been set up by utilizing an on-line survey platform, i.e., Lime Survey. Each national responder was provided with a specific token for accessing the on-line survey and providing responses to the included questions. In cases where countries did not submit updates, we decided to retain the previous responses, maintaining this way data continuity among the two versions.

The questionnaire of the on-line survey is divided into nine sections. Sections 1 to 7 requests general information about the NAPs, their implementation status, and the availability of data categories defined at a medium to high level of aggregation of the data types specified within the DRs supplementing the ITS Directive (2010/40/EU). In addition to that, each section has additional questions regarding the geographical, network, and transport mode coverage of the available data categories mirroring the approach of the second version of the report. The information collected from these questions has been stored in the dedicated database of the on-line survey for later use, but has not been included in the current report, since our aim was to keep it simple and leave space for the development of an on-line NAP monitoring tool. Moreover, the accumulated evidence showcases that the responses from most countries have remained consistent in terms of geographical and network coverage compared to the previous version. Section 8 of the questionnaire requests information about the implemented data standards and technical format per specific data type and information element specified within each of the DRs supplementing the ITS Directive. The overall structure of the questionnaire behind this survey is similar to the structure adopted during the preparation of the second version of the current report. Finally, section 9 includes additional questions, relevant to the handling of data quality by NAPs, the types of data licensing, and the progress of compliance assessment procedures. The structure of the current report is briefly summarized in the following paragraphs.

Chapter 1 briefly presents the NAPCORE project, the activities of WG3, the objectives of the survey, as well as the methodology followed for this task.

Chapter 2 provides an overview with regard to the status of NAPs of each DR. More specifically, it presents the number of NAPs that are operational, planned or under implementation for all DRs. The results of the EIP+ and EU EIP projects are also included, thus the evolution of the NAPs can be followed from 2016 to 2023. Having in mind that an operational NAP does not necessarily imply data availability, the same chapter (Chapter 2) pays particular attention to the topic of data availability. This is done based on a medium to high level categorization of the data types mentioned within the DRs supplementing the ITS Directive (2010/40/EU).

Chapter 3 is completely devoted to data standards. Specifically, it provides an overview of the existing standards that are used at the European level for data exchange through the NAPs and in general for

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the provision of traffic management and information services. Besides that, it pays particular attention to the monitoring of what data standards are implemented in each country per data element mentioned in the Annexes of the DRs supplementing the ITS Directive.

Chapter 4 provides insight into the outcomes of the remaining parts of the executed survey. These parts revolve around the classification of NAPs based on their architecture and the availability of metadata and discovery services. Moreover, these parts entail additional information about data licensing and compliance assessment

5.2. Discussion of report's findings

The findings of **Chapter 2** as regards NAP status indicate that almost all European countries operate a NAP for SRTI and RTTI (24 and 25 countries respectively). In the previous report, some countries, such as the UK, have declared having a NAP which is under implementation, but now they have changed their status to "planned". This shift may be attributed to their ongoing plans for the development of a new NAP platform.

Furthermore, it appears that 20 countries have an operational NAP for SSTP; however, it should be considered that most of the remaining countries did not operate in 2022 safe & secure truck parking places/areas. In this respect, their status is addressed as "not applicable". Compared to the previous report, three countries have planned or are in the phase of implementation of a new platform/interface to act as a NAP for SSTP (LV, CH, UK). Therefore, their status is now considered "planned".

Finally, it appears that 24 countries operate a NAP for MMTIS. This translates to a significant evolution compared to 2019 (almost two years after the adoption by the EC of the MMTIS regulation), where the number of operational NAPs for MMTIS was just 8. It should be noted that for several countries a link is included in the Annex list; however, it appears that in certain cases this link leads to a platform that does not provide access to MMTIS-related datasets or to a governmental platform that may either serve as a temporary interface for MMTIS data or provide a wide range of data not necessarily related to ITS in general and MMTIS in particular (e.g., statistical data).

The findings of **Chapter 2** as regards data availability are quite heterogeneous. Firstly, it appears that static SSTP-related data are made available by the NAP of 15 to 18 countries. Available data types encompass information about safe & secure truck parking places/areas, their safety conditions and equipment, as well as details of parking operators. To the contrary, only 5 countries appear to make available through their NAP dynamic SSTP-related data (providing information about the availability and status of parking places/areas).

Secondly, SRTI-related data (that are by definition dynamic) are made available by the NAP of 23 countries. Such a finding validates the initially made assumption, according to which NAP status is not one-to-one related with data availability. The reason behind the observed difference between SRTI NAP status and SRTI data availability will be further investigated in the next version of the current report. At the moment, it is highly accepted that several countries may address datasets provided through their NAP as relevant with road safety and, thus, SRTI DR; however, provided datasets do not necessarily match with the data types specified by the SRTI DR.

Thirdly, static RTTI-related data are made available by the NAP of 18 to 19 countries. However, this is the case for data types providing information about the road network (e.g., road network links and their physical attributes) and roadside/roadway infrastructure (e.g., tolls, rest areas, etc.). To the contrary, static data providing information about the usage of the road network (e.g., traffic circulation

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plans, freight delivery restrictions, etc.) are made available by the NAP of only 7 countries. Furthermore, dynamic RTTI-related data are made available by the NAP of 17 to 22 countries.

Fourthly, as also stated within Chapter 2, there is an observable discrepancy amongst what types of MMTIS-related data are made available by European NAPs. In particular, static MMTIS-related (a) supporting trip plan computation, (b) providing information about existing trip plans and auxiliary information (e.g., vehicle facilities), and (c) supporting location search are made available by the NAP of 8 to 19 countries. On the other end of the spectrum, static MMTIS-related data (a) regarding the provision of traveller services in DRT modes and (b) regarding environmental information are made available by the NAP of only 4 to 5 countries. Finally, it is reported that dynamic MMTIS-related information about the cycling network status is made available by the NAP of only 2 countries. It should be noted that specific countries, such as Malta, addressed this topic from the perspective of what is already available in terms of data irrespectively of NAP status.

The findings of **Chapter 3** as regards what data standards are implemented in each country, show that DATEX II is the dominantly implemented data standard in the context of SSTP, SRTI, and RTTI regulations. Specifically, the number of countries that exchange, by using DATEX II, information about (a) the attributes of safe & secure truck parking places/areas, (b) the safety conditions and equipment of safe & secure truck parking places/areas, (c) the contact details of parking operators, and (d) the availability and status of safe & secure truck parking places/areas are at least: 11 (excluding information about pricing), 9, 6, and 4, respectively. The use of other data standards in the context of SSTP is very low (compared to DATEX II). Similarly, the number of countries that exchange, by using DATEX II, dynamic road-safety related traffic information is at least 14, while the use of other data standards in the context of SRTI is also very low (compared to DATEX II).

The number of countries that exchange, by using DATEX II, information about (a) the road network (including its attributes, usage, and roadside/roadway infrastructure), (b) the road status, and (c) prevailing traffic conditions is at least: 1, 2, and 3 respectively. The use of other data standards in the context of RTTI is significant (compared to the use of DATEX II) only with respect to the provision of static information about the road network. Frequently used standards, in this respect, constitutes WMS/WFS and TN-ITS. Even so, DATEX II is dominant for three data categories: permanent access restrictions, location of parking places and service areas, and location of charging points for electric vehicles. WMS/WFS is used for all data categories, while TN-ITS is used for approximately 2/3 of them. In most cases, there is an almost equal share between WMS/WFS and TN-ITS, however, there are three data categories where WMS/WFS is dominant: geometry, road classification and number of lanes. The significant use of WMS/WFS can be attributed to the widespread use of WMS/WFS by the developers/maintainers of map servers.

Concerning MMTIS, the obtained picture looks quite heterogeneous. In broad terms, it appears that NeTEx is the mostly used data standard for the exchange of static MMTIS-related information. This is especially the case for the exchange of data (a) supporting location search, (b) supporting detailed common standard and special fare queries, (c) providing insight into existing trip plans and auxiliary aspects (e.g., vehicle facilities), and (d) supporting trip plan computation. However, the number of countries that have implemented NeTEx is quite low especially compared to the number of countries that have implemented DATEX II. It should also be noted that the use of INSPIRE is common for static information for location search. Concerning the deployment and adoption rate of SIRI, it is impossible to draw concrete conclusions mainly due to very low availability and exchange of dynamic MMTIS-related data within/through the NAPs of Europe. Based on the updated figures, SIRI is the mostly used data standard for the exchange of dynamic passing time, trip plan, and auxiliary information. Interestingly, the use of DATEX II is also reported in the exchange of dynamic MMTIS-related information. This is the case for the exchange of dynamic information for availability check. This finding

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validates the existence of overlaps in data standards, which is a topic under investigation by the WG4 of NAPCORE.

In terms of location referencing, the most utilized methods for encoding point locations appear to be, in descending order, coordinates, Alert C point, Open LR point, and point along linear element. Furthermore, the mostly utilized methods for encoding linear locations are, in descending order, Alert C linear, linear along linear element, and Open LR linear. Finally, the mostly utilized methods for encoding area locations are, descending order, Alert C area, Open LR area, and GML multipolygon.

The findings of **Chapter 4** as regards implemented NAP types show that various architectures have been preferred by European countries. Firstly, the results regarding the implemented NAP types for SSTP show that 7 countries have preferred the web-link type, while 9 have preferred the database type. Other 6 countries indicated that their NAP platform operates as both database and web-link repository (hybrid approach). In addition, there are 8 answers mentioning that the implementation of a NAP for SSTP is "not applicable", which is much higher than the other DRs. This is to be expected as many countries chose to provide information through the European Access Point for Truck Parking Data and not develop a national platform/ technical interface. Secondly, the results regarding the implemented NAP types for SRTI show that almost half (12) are purely web-link type, 9 are purely database type, and only 6 stick to the hybrid approach. The remaining countries declare the option "not applicable". Thirdly, the results regarding the implemented NAP types for RTTI show that 12 countries indicated that their NAP is web-link type, 10 that their NAP is explicitly database type, and 6 that their NAP sticks to the hybrid approach. Finally, the results regarding NAPs for MMTIS show that most of them (13) are purely web-link type while only 4 are purely database type. This is consistent with previous findings, and can be attributed to the high complexity and heterogeneity of MMTIS-related datasets that complicate the storage of all information in a single common database.

As regards the availability of metadata and discovery services, the findings of **Chapter 4** show that the vast majority of countries provides these functionalities. However, a minority of countries stated that they cannot provide this type of information through their NAPs. In some cases, the lack of metadata and discovery services can be attributed to a different operational approach. For instance, the Finish NAP for SSTP/RTTI can be addressed as an API service configurable to data requests.

Taking into account the usefulness of existing open data with the aim of enlarging the ITS community, a part of the executed survey was orientated to obtain information about the amount of open data that is exchanged through NAPs. The results have indicated that most countries provide their datasets under open licensing frameworks. However, some countries mentioned the difficulty of estimating the percentage of open datasets given the status of their NAP (e.g., not fully operational, under implementation). Finally, there were cases according to which countries provide their datasets under open conditions, but this happens after signing a required contract. The most popular licensing frameworks utilized are Creative Commons Zero (CC0) and the Creative Commons Share-Alike (CC BY-SA).

Finally, as regards compliance assessment, the findings of Chapter 4 indicate that in most countries a self-declaration has been submitted for a very limited number of datasets or not submitted at all. However, there are some countries that "break the rule". In these countries, a self-declaration has been submitted for a significant number of datasets (i.e., there are 9 countries in which a self-declaration has been submitted by data providers for more than 66% of published datasets through NAPs). The findings of the same chapter also indicate that the number of countries in which compliance assessment has been executed is less than the number of countries in which data providers have submitted self-declaration forms (i.e., 6 countries are mentioning that more than 66% of their datasets have been undergone a compliance assessment procedure). This finding highlights the importance of

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detailing and harmonizing compliance assessment processes, which constitutes a topic addressed by WG5 of NAPCORE.

5.3. Overview of other findings of the executed survey

The current chapter provides an overview of the remaining parts of the executed survey. Firstly, **data quality** is interpreted differently by NAP operators. Some of them mention that there is neither available information about the quality of the datasets nor implemented quality criteria/requirements. Some others mention that the so-called Quality Packages implemented in the context of the EU EIP project should be the basis for defining quality criteria and requirements and feeding accordingly the metadata fields of each dataset. However, it is generally addressed that this is not solely or at all under the responsibility of NAP operators. Responsible actors, according to the executed research, include data providers, TMC and road operators, relevant control bodies, and operators of information systems providing data to NAPs. Overall, all countries highlighted the importance of having implemented harmonized quality criteria following specific norms. For that reason, and recognizing the necessity of the topic, another dedicated task of the NAPCORE project, falling under WG3 activities, focuses on the definition of quality frameworks.

Regarding **NAP data providers**, the results of the executed survey show that the provision of data to the European NAPs follows both a centralized and decentralized pattern, i.e., datasets are provided by either a few or multiple data providers. It can also be concluded that NAPs are supported (in terms of data provision) by both the public and private sectors. However, the respective share is case specific given that in some NAPs the number of public data providers clearly outweigh the number of private data providers and vice versa. With respect to **NAP data users/consumers**, it appears that only a few countries can estimate their number. This is attributed to two main reasons. Firstly, several NAPs provide open data that do not require registration. Secondly, even in case a registration is required it is uncertain whether registered parties make use of the provided data. A specific activity of WG3 will seek to demonstrate use cases making use of NAP data in an effort to further promote the added value and impact of NAPs in the ITS ecosystem. Finally, NAP operators and other actors who took part in the executed research pointed out several **future NAP data additions**. These are associated with (a) data from national mobility research projects (reports, statistics), (b) data for mobility policies (e.g., LEZs) and new modes (e.g., bicycles, carpooling), (c) road maintenance data (e.g., snowplough fleet), (d) weather data, emergency alerts, and road temperature data, (e) hydrology and waterways data, and (f) static data about transport infrastructure in line with INSPIRE and TN-ITS (for more details please refer to Section 4.6).

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Annex I - National Access Points

Country	Safe and Secure Truck Parking	Safety Related Traffic Information (SRTI)	Real Time Traffic Information (RTTI)	Multimodal Travel Information Services (MMTIS)
Austria	https://mobilitydata.gv.at/	https://mobilitydata.gv.at/	https://mobilitydata.gv.at/	https://mobilitydata.gv.at/
Belgium	www.transportdata.be	www.transportdata.be	www.transportdata.be	www.transportdata.be
Bulgaria	https://datasheet.api.bg/	https://datasheet.api.bg/	https://lima.api.bg/ https://datasheet.api.bg/	https://www.mtc.government.bg/en/category/294/national-access-points-transport-related-data
Croatia	www.promet-info.hr/en/	www.promet-info.hr/en/	www.promet-info.hr/en/	www.promet-info.hr/en/
Cyprus	Not applicable	http://www.traffic4cyprus.org.cy/	http://www.traffic4cyprus.org.cy/	http://www.traffic4cyprus.org.cy/
Czech Republic	https://registr.dopravniinfo.cz/en/	https://registr.dopravniinfo.cz/en/	https://registr.dopravniinfo.cz/en/	https://data.gov.cz/datasets
Denmark	https://du.vd.dk	https://du.vd.dk	https://du.vd.dk	https://du.vd.dk
Estonia	https://www.tarktee.ee/#/en/datex	https://www.tarktee.ee/#/en/datex	https://www.tarktee.ee/#/en/datex	http://peatus.ee/gtfs/ https://web.peatus.ee/
Finland	https://www.avoindata.fi/data/fi/dataset/rekkaparkit-tiella-e18	https://www.digitraffic.fi/	https://www.digitraffic.fi/ https://vayla.fi/en/transport-network/data/digiroad	https://finap.fi/#/
France	https://www.bison-fute.gouv.fr/directive-sti,id_sous_rubrique10423,langen.html	https://www.bison-fute.gouv.fr/directive-sti,id_sous_rubrique10401.html	https://www.bison-fute.gouv.fr/directive-sti,id_sous_rubrique10401,langen.html	https://transport.data.gouv.fr/
Germany	Mobilithek.info	Mobilithek.info	Mobilithek.info	Mobilithek.info
Greece	http://data.nap.gov.gr/	http://data.nap.gov.gr/	http://data.nap.gov.gr/	http://data.nap.gov.gr/
Hungary	https://napportal.kozut.hu/	https://napportal.kozut.hu/	https://napportal.kozut.hu/	Not applicable
Ireland	Not applicable	https://data.gov.ie/	https://data.gov.ie/	https://data.gov.ie/
Italy	https://www.cciss.it/web/cciss/homepage	https://www.cciss.it/web/cciss/homepage	https://www.cciss.it/web/cciss/homepage	https://nap-1926.it/nap/mmtis/public/en/static/multimodal
Latvia	Not applicable	Not applicable	Not applicable	Not applicable
Lithuania	Not applicable	http://nap.lakd.lt/	http://nap.lakd.lt/	http://nap.lakd.lt/
Luxembourg	https://data.public.lu/fr/datasets/?tag=its	https://data.public.lu/fr/datasets/?tag=its	https://data.public.lu/fr/datasets/?tag=its	https://data.public.lu/fr/datasets/?tag=its

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Country	Safe and Secure Truck Parking	Safety Related Traffic Information (SRTI)	Real Time Traffic Information (RTTI)	Multimodal Travel Information Services (MMTIS)
Malta	Not applicable	Not applicable	Not applicable	Not applicable
The Netherlands	https://nt.ndw.nu/#/home	https://nt.ndw.nu/#/home	https://nt.ndw.nu/#/home	https://nt.ndw.nu/#/home
Norway	Not applicable	https://transportportal.atlas.vegvesen.no/en/	https://transportportal.atlas.vegvesen.no/en/	https://transportportal.atlas.vegvesen.no/en/
Poland	https://kpd.gddkia.gov.pl/index.php/en/homepage/	https://kpd.gddkia.gov.pl/index.php/en/homepage/	https://kpd.gddkia.gov.pl/index.php/en/homepage/	Not applicable
Portugal	Not applicable	https://nap-portugal.imt-ip.pt/nap/	https://nap-portugal.imt-ip.pt/nap/	https://nap-portugal.imt-ip.pt/nap/
Romania	http://pna.cestrin.ro/en/services/download-options/	http://pna.cestrin.ro/en/services/download-options/	http://pna.cestrin.ro/en/services/download-options/	http://pna.cestrin.ro/en/services/download-options/
Slovakia	https://www.ndsas.sk/i-love-dialnica/mobilna-aplikacia-1	https://www.zjazdnost.sk/map/view.htmlhttps://www.datex2.eu/sites/default/files/DATEX%20II%20PIM-METR-DLM-package-6.xml	Not applicable	Not applicable
Slovenia	https://nap.si/en	https://nap.si/en	https://nap.si/en	https://nap.si/en
Spain	https://portalweb.mitma.es/aplicaciones/portalweb/VisorMapaDGC/AparcamientosSeguros	https://nap.dgt.es/	https://nap.dgt.es/,	https://nap.mitma.es/
Sweden	Trafficdata.se	Trafficdata.se	Trafficdata.se	Trafficdata.se
Switzerland	Not applicable	Not applicable	https://opentransportdata.swiss/en/rt-road-traffic-counters/	https://openmobilitydata.swiss
United Kingdom	Not applicable	Not applicable	Not applicable	Not applicable

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Annex II - National Bodies

Country	Safe and Secure Truck Parking	Safety Related Traffic Information (SRTI)	Real Time Traffic Information (RTTI)	Multimodal Travel Information Services (MMTIS)
Austria	AustriaTech GmbH	AustriaTech GmbH	AustriaTech GmbH	AustriaTech GmbH
Belgium	anyways.eu	anyways.eu	anyways.eu	anyways.eu
Bulgaria	Unknown/currently not existing	Unknown/currently not existing	Unknown/currently not existing	Unknown/currently not existing
Croatia	Not existing	Not existing	Not existing	Not existing
Cyprus	Not existing	Public Works Department, Ministry of Transport Communications and Works	Public Works Department, Ministry of Transport Communications and Works	Public Works Department, Ministry of Transport Communications and Works
Czech Republic	The Ministry of Transport of the Czech Republic	The Ministry of Transport of the Czech Republic	The Ministry of Transport of the Czech Republic	The Ministry of Transport of the Czech Republic
Denmark	Not existing	The legal department at the Danish Road Directorate	The legal department at the Danish Road Directorate	Not existing
Estonia	Ministry of Climate	Ministry of Climate	Ministry of Climate	Ministry of Regional Affairs and Agriculture
Finland	Finnish Transport and Communications Agency Traficom	Finnish Transport and Communications Agency Traficom	Finnish Transport and Communications Agency Traficom	Finnish Transport and Communications Agency Traficom
France	AFIMB	AFIMB	AFIMB	Direction générale des infrastructures, des transports et des mobilités (DGITM)
Germany	Nationale Stelle für Verkehrsdaten / NAST	Nationale Stelle für Verkehrsdaten / NAST	Nationale Stelle für Verkehrsdaten / NAST	Nationale Stelle für Verkehrsdaten / NAST
Greece	Road Toll Service - Ministry of Infrastructure and Transport	Road Toll Service - Ministry of Infrastructure and Transport	Road Toll Service - Ministry of Infrastructure and Transport	Road Toll Service - Ministry of Infrastructure and Transport
Hungary	Ministry for Construction and Traffic	Ministry for Construction and Traffic	Ministry for Construction and Traffic	Ministry for Construction and Traffic
Ireland	Not existing	Transport Infrastructure Ireland	Transport Infrastructure Ireland	National Transport Authority
Italy	ART – Autorità di regolazione dei Trasporti	ART – Autorità di regolazione dei Trasporti	Not existing	Not existing
Latvia	Ministry of Transport Republic of Latvia representing policy level	Ministry of Transport Republic of Latvia representing policy level	Ministry of Transport Republic of Latvia representing policy level	Ministry of Transport Republic of Latvia representing policy level

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	and SJSC Latvian State Roads representing operational level	and SJSC Latvian State Roads representing operational level	and SJSC Latvian State Roads representing operational level	and SJSC Latvian State Roads representing operational level
Lithuania	Lithuanian Road Administration	Lithuanian Road Administration	Ministry of Transport and Communications	Lithuanian Transport Safety Administration
Luxembourg	Ministry of mobility and public works	Ministry of mobility and public works	Ministry of mobility and public works	Ministry of mobility and public works
Malta	Not existing	Not existing	Not existing	Not existing
The Netherlands	RDW (Netherlands Vehicle Authority)	RDW (Netherlands Vehicle Authority)	Not existing	Not existing
Norway	Not existing	Road Supervisory Authority	Road Supervisory Authority	Not yet appointed
Poland	"Główny Inspektorat Transportu Drogowego" (eng. Chief Road Transport Inspectorate)	"Główny Inspektorat Transportu Drogowego" (eng. Chief Road Transport Inspectorate)	"Główny Inspektorat Transportu Drogowego" (eng. Chief Road Transport Inspectorate)	Ministry of Infrastructure
Portugal	The activities foreseen for the National Body are currently embedded in the activities of IMT – Instituto da Mobilidade e dos Transportes, I.P.	The activities foreseen for the National Body are currently embedded in the activities of IMT – Instituto da Mobilidade e dos Transportes, I.P.	The activities foreseen for the National Body are currently embedded in the activities of IMT – Instituto da Mobilidade e dos Transportes, I.P.	The activities foreseen for the National Body are currently embedded in the activities of IMT – Instituto da Mobilidade e dos Transportes, I.P.
Romania	Romanian Road Authority	Romanian Road Authority	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure
Slovakia	Ministry of Transport and Construction of the Slovak Republic	Ministry of Transport and Construction of the Slovak Republic	Ministry of Transport and Construction of the Slovak Republic	Ministry of Transport and Construction of the Slovak Republic
Slovenia	Ministry of Infrastructure, National Traffic Management Centre	Ministry of Infrastructure, National Traffic Management Centre	Ministry of Infrastructure, National Traffic Management Centre	Ministry of Infrastructure, National Traffic Management Centre
Spain	Ministry of Transport, Mobility and Urban Agenda	General Directorate for Traffic of Spain (Dirección General de Tráfico -DGT). Ministry of Interior (Ministerio del Interior)	General Directorate for Traffic of Spain (Dirección General de Tráfico -DGT). Ministry of Interior (Ministerio del Interior)	Ministry of Transport, Mobility and Urban Agenda
Sweden	The Swedish Transport Agency (Transportstyrelsen)	The Swedish Transport Agency (Transportstyrelsen)	The Swedish Transport Agency (Transportstyrelsen)	The Swedish Transport Agency (Transportstyrelsen)
Switzerland	Not existing	Not existing	Not existing	Not existing
United Kingdom	Not existing	Not existing	Not existing	Not existing

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