



NAP data insights

Overview of data availability and provision

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Abstract

This report, "NAP data insights: Overview of data availability and provision", constitutes a deliverable of the NAPCORE project, a Programme Support Action funded under the Connecting Europe Facility (CEF). It aims to support Member States in identifying and addressing gaps in the provision of data and



metadata related to the ITS Directive Delegated Regulations and to promote the adoption of best practices. The report identifies barriers to effective data and metadata sharing (e.g. organisational, regulatory, technical and financial), highlighting successful strategies and replicable solutions through targeted analysis of selected NAPs. A more detailed, metadata-based automated assessment is additionally carried out for the Belgian NAP, illustrating the potential of this approach to complement, extend and improve the quality of availability assessments. Actionable recommendations for Member States are proposed, ranging from governance and policy measures to more specific recommendations for improving data and metadata availability.

Abbreviations

Abbreviation	Meaning
AFIR	Alternative Fuels Infrastructure (Regulation)
CAT	Core Alignment Team
DATEX II	European standard for the exchange of traffic data
DCAT	Data Catalogue Vocabulary (W3C)
DCAT-AP	Data Catalogue Vocabulary Application Profile
DG MOVE	Directorate-General for Mobility and Transport
EC	European Commission
GNSS	Global Navigation Satellite System
ITS	Intelligent Transport Systems
KPI	Key Performance Indicator
LoS	Level of Service
MMTIS	Multimodal Travel Information Services
mobilityDCAT-AP	Mobility-specific Application Profile extension of DCAT-AP
NAP	National Access Point
NAPCORE	National Access Point Coordination Organisation for Europe
NeTEx	Network Timetable Exchange
RTTI	Real-Time Traffic Information
SC, SCOM	Steering Committee
SCS	Steering Committee Support
SIRI	Service Interface for Real Time Information
SRTI	Safety-related Traffic Information
SSTP	Safe and Secure Truck Parking
SWG	Sub-working Group
TEL-TSI	Technical Specification for Interoperability relating to Telematics (rail)
TN-ITS	Transport Network - Intelligent Transport Systems
WG	Working Group
WP	Working Programme

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1. Introduction

The Intelligent Transport Systems (ITS) Directive 2010/40/EU (consolidated version including the amendments introduced by Directive 2023/2661/EU) on the framework for the deployment of ITS in the field of road transport and for interfaces with other modes of transport establishes, under Article 17, an obligation for Member States to report to the European Commission by 21 March 2025 and on a 3-yearly basis thereafter, on the progress made in the implementation of the Directive and its Delegated Regulations and implementing acts [1]. This report covers the main national activities and projects related to established priority areas and the availability of data and services listed in Annexes III and IV of the Directive. This obligation creates a recurring need for Member States to maintain structured, consistent, and reliable information on the availability and provision of their mobility data.

Within the scope of the NAPCORE initiative, through which the European Commission seeks to support Member States to better implement the goals of the ITS Directive, Task 5.1, *NAP Data Insights & Reporting Support*, aims at identifying more effective and coherent approaches to fulfilling their reporting obligations under the ITS Directive. National Access Points (NAPs) were very early on identified as a strategic source of information for future reporting activities.

Figure 1 conceptually illustrates Task 5.1. The storyboard starts with the reporting obligations defined by the ITS Directive, under which Member States must submit an implementation report to the European Commission by 21 March 2025 and subsequently provide progress reports every three years. It then depicts the various stakeholders involved in collecting, preparing and analysing the information required for reporting. NAPCORE, represented in yellow (bottom-left frame), through research and development activities, intends to support compliance with the formal reporting requirements and streamline the methodologies and assessment strategies used for reporting, improving its completeness, ease of implementation and harmonisation across Member States.

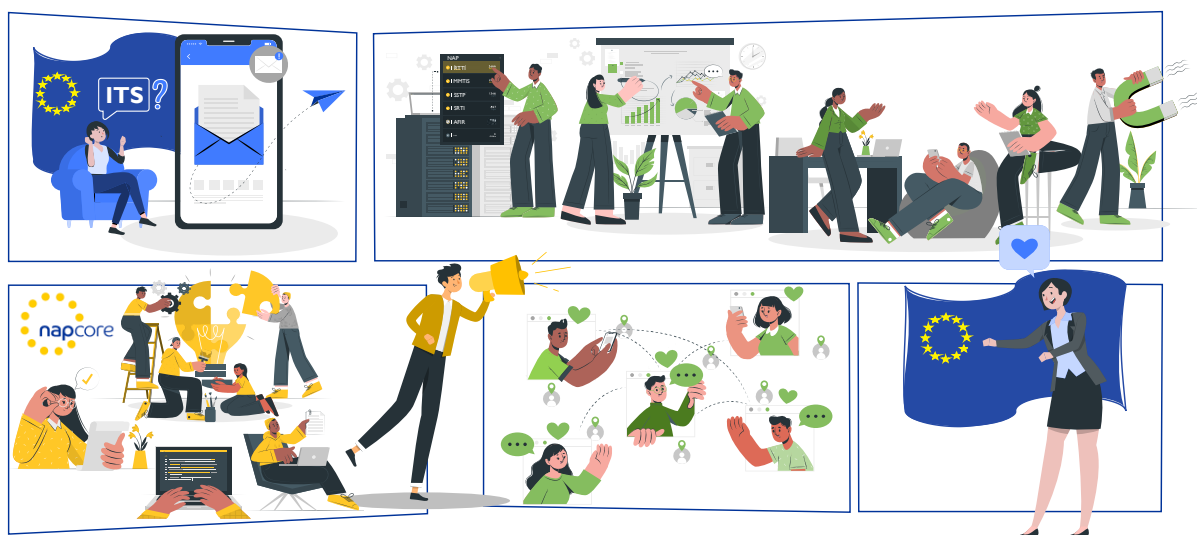


Figure 1. Task 5.1 conceptual storyboard

To meet the objectives of Task 5.1, three subtasks are scheduled to carry out the following:

- **Subtask 5.1.1** – to assess the status of data and metadata availability and provision in the different Member States.
- **Subtask 5.1.2** – to develop guidelines on metadata-assisted reporting, analysis of the DG MOVE ITS reporting template.
- **Subtask 5.1.3** – to develop a prototype of a tool for Automated Metadata Harvesting, Validation and Assisted Report Generation – ITS Reporting Tool.



It is within the first outlined subtask that the present deliverable can be framed, as a first glimpse on the current situation on data and metadata availability and provision in selected National Access Points (NAPs).

Based on information voluntarily provided by participating NAPs, mostly connected to Active partners of T5.1, D5.1.1 examines the availability of data categories covered by the ITS Directive and related regulatory frameworks, current metadata provision practices, and the adoption of harmonised metadata approaches. In addition, the deliverable explores methodologies for assessing data and metadata availability, identifies major gaps in data provision, proposes a metadata maturity assessment approach, and presents selected NAP case studies illustrating practical implementation experiences and lessons learned.

The findings provide valuable input for the subsequent development of metadata-assisted reporting guidelines and automated reporting solutions within Task 5.1.

1.1. Background on National Access Points

NAPs, as defined by the ITS Directive 2010/40/EU, serve as single points of access to the national mobility data ecosystem in each Member State. These digital interfaces play a central role in making mobility data discoverable, accessible, and reusable, thereby supporting both national and cross-border ITS services [1].

NAPCORE refines the definition as digital interfaces set up by a Member State to provide a single-point access to data, in compliance with the Delegated Regulations of the European Commission that establish functional, technical, organisational, and service provisions to guarantee compatibility, interoperability, and continuity in the deployment and operational use of Intelligent Transport Systems.

Despite this common purpose, significant differences persist among NAPs in terms of data availability, the adoption of standards, and data quality. These inconsistencies can hinder the smooth exchange of mobility data, limit interoperability and reusability for stakeholders operating across national borders and ultimately decelerate seamless data exchange between NAPs and hence deter innovative cross-border ITS solutions. Addressing these challenges requires not only increasing data availability, but also applying common metadata frameworks, and adopting harmonised standards, formats, and quality requirements. Aligning road, traffic, travel and mobility data published on NAPs with the principles of interoperability, compatibility, and continuity set out in the ITS Directive is therefore essential for effective operational use, both at national level and across Europe.

The growing importance of these issues is further illustrated by recent regulatory developments. Commission Delegated Regulation (EU) 2017/1926 amended by Delegated Regulation 2024/490 (MMTIS) [2], expands the scope of mandatory datasets to include, for example, parking availability and tariffs, micromobility locations, as well as real-time information on travel times, and delays affecting multimodal transport services. These new requirements further increase the responsibility for Member States to enhance the availability, quality, and interoperability of their mobility data.

In practical terms, data providers/holders and data re-users established in one Member State can effectively integrate and reuse multimodal mobility data from another Member State if such data is made available via the NAP in an accurate, machine-readable manner, meets defined quality criteria, and complies with commonly agreed EU specifications, standards, and is documented with mobilityDCAT-AP as the preferred metadata specification. As an example, NAPCORE tackles the lack of harmonisation of access nodes identifiers throughout datasets in the NAPs (Task 2.4), which can be considered a barrier to seamless cross-border data integration. In parallel, Task 5.3 focuses on data



quality frameworks to support stakeholders in gaining a better understanding of the requirements involved and how they can be met.

While this report does not focus exclusively on multimodal data availability, the multimodal use case provides a concrete example of why interoperable data and metadata are critical, demonstrating how harmonisation and quality form the foundation for the delivery of seamless ITS services and the societal benefits derived from an integrated and interoperable European mobility ecosystem. NAPs play a central role in this context by enabling the discovery, access, exchange, and reuse of mobility data across borders, thereby contributing to a more connected, efficient, and user-centric European transport system.

Three different types of NAPs can be distinguished, with the following characteristics:

- **Metadata directories:** NAPs that contain descriptions of the data and services essential for their identification, assessment, and subscription, i.e., metadata. They provide facilities to authenticate data providers and functionality to insert metadata records. Metadata directories offer search and discovery services of the hosted records to end users and, through machine readable content, to other upstream services. Metadata directories are not directly involved in the data exchange between data providers and data consumers.
- **Data platforms:** NAPs that contain descriptions of the data and services important for their identification, assessment, and subscription by, i.e., metadata, together with the data and/or services themselves. They provide facilities to authenticate data providers, and optionally, data consumers, and allow data and metadata records to be inserted into the NAP's internal database. Data platforms provide search and discovery services for hosted records to end users and, via machine readable content, to other portals and distribution interfaces. Data platforms are intermediaries between data providers and data consumers, however, the data remains under the ownership of the data providers.
- One can also identify the possibility of NAPs being of “hybrid” type, combining the functionalities of both types, metadata directory and data platform, providing access to hosted data and services while also enabling the discovery of datasets that remain outside the NAP infrastructure.

1.2. Importance of data and metadata availability and provision

Data discoverability and accessibility via a dedicated data portal is at the core of the success of transportation related digital services, policy implementation and overall quality of a mobility data ecosystem. Under the ITS Directive, NAPs are viewed as the point of access to mobility related data, strategically aligned with the objectives of data discoverability, ease of access, availability, quality, reliability, and interoperability. In their role of providing a digital layer interlinking the different mobility data ecosystems, guidance is found in legislation on which data should be made available.

ITS Directive's article 6a 'Availability of data and deployment of ITS services', establishes that where underlying information exists, data should be made available for the relevant geographical coverage within a specified timeline and be accessible via NAPs. Contrasting with the previous version, the amended Directive makes these obligations mandatory and binding on EU Member States.

The connected Delegated Regulations, regulations and implementing acts list the categories, sub-categories and data types to be made available for specific ITS domains, including multimodal travel information services, real-time traffic information, road safety-related traffic information, and safe and secure truck parking services. Together, these instruments determine a comprehensive framework for mobility data availability and accessibility across Europe.

Other European regulatory initiatives, such as the Alternative Fuels Infrastructure Regulation (AFIR) and the technical specification relating to the telematics subsystem of the rail system in the European Union for interoperability of data sharing in rail transport (TEL-TSI), introduce further data-sharing requirements within their respective domain.

The increasing number of sector-specific requirements demonstrates a broader transition in European transport policy from data collection towards data-driven service provision. Data made available through NAPs serves regulatory compliance and, more importantly, acts as a key enabler for digital mobility services, network management, operational planning and evidence-based policy making.

The availability of standardised and machine-readable datasets supports the development of multimodal journey planners, improves traffic information services, navigation applications, safety monitoring tools and connected mobility solutions. So, ensuring that datasets are not only available but also accessible and reusable has become a strategic objective of the European mobility data panorama.

In addition to availability, recent legislation further highlights the importance of data quality, timeliness and reliability. Across the ITS legal framework, data is expected to be of high quality for operational use, requiring regular updates and the correction of identified inaccuracies whenever possible. This highlights that the effectiveness of mobility services depends not only on the existence of data but also on the trustworthiness of the information provided. In this context, NAPs additionally take on the role of supporting transparency, consistency and quality assurance.

More details on the categories/types connected to the ITS Directive, delegated and implementing acts are given in section 4 alongside a current overview of their provision in selected NAPs.

Effective discovery, access, and reuse of data depend on clear and standardised documentation of the available datasets and services through relevant metadata. Inconsistent usage of metadata frameworks across EU Member States limits cross-border reuse and may potentially reduce the efficiency of EU-wide data sharing mechanisms.

As defined in the MMTIS DR and the EU Data Act (EU) 2023/2854 [3], metadata refers to structured information describing the contents and use of data, facilitating its identification, discovery, and reuse. When metadata is defined using common standards, profiles, and controlled vocabularies (e.g. DCAT-AP), it enables both human and machine interpretation. Well-defined metadata improves computer-based data discoverability and helps users understand the content, structure, and connections between datasets.

Beyond supporting discoverability, metadata constitutes a fundamental interoperability mechanism. While datasets may be published using different systems, organisational structures or national practices, metadata enables a common understanding of what information is available and under which conditions it can be accessed and reused. Metadata therefore facilitates communication between data providers, NAP operators, service developers and end users by providing structured information on dataset ownership, accessibility, licensing conditions, geographical coverage, update frequency and applicable standards.

To support a seamless mobility data ecosystem, within the NAPCORE project, the mobility-specific extension of DCAT-AP was developed. mobilityDCAT-AP defines standardised metadata elements for mobility-related datasets, enabling consistent identification of aspects such as transport mode, data theme and data formats. The proper adoption of mobilityDCAT-AP on NAPs helps to standardise the description of mobility data and eases the exchange of this information.

Through common definitions and controlled vocabularies, mobilityDCAT-AP also supports semantic interoperability, reducing inconsistencies between national implementations so that datasets published by different Member States are easier to compare, aggregate and integrate into cross-border services.

The growing relevance of metadata is particularly evident in the context of emerging European data spaces. Rather than relying on centralised repositories, data spaces are generally based on federated approaches where datasets remain under the control of their original providers while being discoverable through interconnected metadata catalogues and services. In such environments, metadata becomes a critical enabler of interoperability, allowing distributed resources to be found, understood and accessed across organisational and national boundaries.

1.3. Objectives of this report

In line with this regulatory and operational background, the present deliverable focuses on the assessment of data and metadata availability and provision across the NAPs using multiple complementary approaches. These include voluntary reporting mechanisms, surveys and stakeholder engagement through NAP showcases, and an analysis of the adoption of mobilityDCAT-AP.

This deliverable aims to support EU Member States in identifying gaps in data and metadata availability for data categories covered by the relevant regulations, highlighting best practices and providing actionable recommendations. By examining existing NAPs, the analysis assesses the completeness and accessibility of available data and metadata, reviews current provision practices, and identifies technical and organisational barriers to effective data sharing. In addition to that, the report highlights replicable solutions through targeted NAP case studies. These illustrate different implementation approaches and organisational solutions and support the exchange of experiences between Member States. Overall, the outcomes of these activities aim to build a common understanding of current practices and to identify areas where greater harmonisation and efficiency can be achieved, supporting enhanced data insights and more effective reporting under the ITS Directive.

Attention is given to the role of metadata in supporting data discoverability, accessibility, transparency and reuse. In this regard, the report examines aspects such as metadata standardisation, metadata catalogue accessibility, metadata export capabilities and machine-readable interfaces. These elements are increasingly relevant for enabling automated inventories, metadata harvesting mechanisms and future metadata-assisted reporting processes.

The deliverable further aims to identify gaps in the availability of regulated data categories, highlight challenges affecting the publication and management of mobility data, and explore opportunities for improving data and metadata provision practices. In addition to the quantitative assessment, selected NAP case studies provide an opportunity for exchange of experiences between Member States and illustrate different implementation approaches, organisational solutions and practical experiences related to NAP operation and development.

Ultimately, the report seeks to support Member States, Competent Authorities/National Bodies and other stakeholders in better understanding the current state of the mobility data landscape, identifying opportunities for improvement, and fostering greater harmonisation, interoperability and efficiency across European NAPs. In doing so, it establishes a foundation for future work on metadata-assisted reporting, automated metadata harvesting and the development of tools supporting reporting obligations under the ITS Directive.

By establishing a baseline understanding of current data and metadata availability and provision practices, this deliverable directly supports the objectives of NAPCORE Task 5.1, NAP Data Insights and



Reporting Support. Even though limited, the presented findings contribute to the identification of common challenges, gaps and opportunities related to data and metadata provision, while also providing input for the subsequent development of metadata-assisted reporting guidelines and automated reporting capabilities. In particular, the assessment of metadata practices, metadata accessibility, and the adoption of harmonised metadata approaches, contributes to the long-term objective of enabling automated metadata harvesting, automated inventories, and more efficient reporting processes under the ITS Directive.

The report is structured around several key topics. It first introduces the regulatory background and the importance of data and metadata availability within the European mobility data landscape. It then presents different approaches for assessing data and metadata availability and provision, followed by an overview of the regulatory data categories covered by the ITS framework and related regulations. Attention then turns to metadata provision, including metadata standards, stakeholder benefits, metadata submission principles, current implementation challenges, metadata accessibility mechanisms and metadata maturity. The report further presents experiences and lessons learned from selected NAP case studies before concluding with a set of actionable recommendations aimed at supporting Member States in improving data and metadata availability, discoverability and interoperability.

1.4. Limitations of the analysis

- Due to the reduced number of NAPs in focus, and the simplified assessment connected to the data categories, results can be considered indicative rather than representative, and should be read as an upper-bound, exploratory estimate of the state of data and metadata availability rather than a definitive measurement.
- Binary indication of whether a dataset is available on the NAP loses in subtlety. For some specific categories (e.g., available for e-scooters and cars), the real situation could be partial, potentially under or overstating availability.
- Study indicates presence (for data availability) and not quality. Within NAPCORE, Task 5.3 Data quality focus specifically on that aspect.
- Detailed analysis on the metadata catalogue is detailed but restricted to a single use case.
- Report presents a snapshot analysis.

2. Methodologies for assessing data and metadata availability and provision

Several methodologies for assessing data and metadata availability are accessible. However, no single methodology can provide a complete and exhaustive picture of this availability, when applied isolated. Therefore, Task 5.1 considered several approaches to assess metadata and data provision on NAPs. The main ones are described in the next sub-sections.

2.1. Voluntary reporting mechanisms

Voluntary reporting mechanisms are a common approach used for assessing the availability and provision of data and metadata across NAPs. Through questionnaires and self-assessment tasks, NAP operators and other stakeholders can provide information regarding the availability of specific datasets, metadata practices, standards adoption and the organisational processes behind them.

The advantage of this approach resides in its flexibility and relatively low implementation effort. Questionnaires can be rapidly distributed, updated to reflect new regulatory requirements and tailored to assess specific data domains, e.g., multimodal travel information services, traffic information, alternative fuels infrastructure. Voluntary reporting enables the collection of contextual information that is often not available through automated methods, including implementation challenges, planned developments and organisational considerations.

However, voluntary reporting mechanisms also present significant limitations. The quality and consistency of the results depend on the interpretation of questions and on the availability of accurate information within the responding organisations. Furthermore, this approach does not always provide a fully reliable assessment. Voluntary reporting should preferably be complemented by other assessment approaches capable of providing additional validation and objective evidence.

Aware of these limits, Task 5.1 prepared a voluntary simplified “questionnaire” and distributed it amongst Active Partners so that a current picture of the state of the NAPs, serving as a baseline and to be complemented by additional mechanisms, could be refreshed.

Previous comparable approaches were embraced within the first phase of NAPCORE, and the results showcased the fragilities of the approach, no matter how sophisticated the exercise or its presentation was. It all came down to the availability of information and the reliability, completeness and trustworthiness of the results.

2.2. Surveys and stakeholder engagement

While questionnaires provide structured information, stakeholder engagement activities offer additional insights into the reasons behind the reported results. Interviews, workshops, NAP showcases and direct exchanges with NAP operators enable a better understanding of the availability of specific datasets, metadata provision, accessibility mechanisms, implementation approaches, governance arrangements, technical challenges and organisational practices.

Stakeholder engagement activities are particularly valuable for identifying lessons learned, exchanging experiences between Member States and highlighting practical solutions that may be replicated by other NAPs. Such interactions also help clarify ambiguities that may arise from questionnaire responses and provide context for observed differences in data and metadata availability and provision. They are especially useful for understanding metadata maturity (e.g., how complete, how accurate, which standard was adopted) and how the accessibility mechanisms were implemented.



The main limitation of this approach is the additional effort required from both organisers and participants, making it less scalable than questionnaire-based approaches. The qualitative nature of the information collected also makes the results more difficult to compare objectively across NAPs. Nevertheless, stakeholder engagement remains an important complement to quantitative assessments and can provide valuable information that would otherwise remain difficult to capture.

2.3. Automated inventories

Automated inventories for data availability assessment on the NAPs can be drastically simplified when NAPs offer metadata catalogue exportation. This approach is scalable and objective, with its effectiveness depending essentially on the existence of complete, consistent and machine-readable metadata describing the datasets published by each NAP. When metadata catalogues are publicly accessible and follow common metadata standards, automated processes can be used to discover, retrieve and analyse information about available datasets.

When metadata is available through mobilityDCAT-AP compliant endpoints, metadata harvesting mechanisms and Resource Description Framework (RDF) query languages such as SPARQL can be used to automatically generate and maintain national and cross-border inventories of available datasets. Proper implementation of a common metadata model allows computer systems to quickly retrieve dataset records across multiple Member States without manual intervention.

Furthermore, SPARQL queries can leverage metadata properties and controlled vocabularies defined within mobilityDCAT-AP to automatically generate inventories focused on specific topics of interest. For example, inventories can be restricted to datasets related to RTTI, MMTIS or AFIR, to specific transport modes, or to datasets matching specific metadata attributes. This capability significantly improves the efficiency of cross-border data discovery and enables targeted reporting and monitoring activities without requiring manual filtering of dataset catalogues.

Compared with voluntary reporting approaches, surveys and stakeholder engagement, automated inventories offer greater consistency, improved scalability and the ability to remain synchronised with changes occurring in NAP metadata catalogues. These characteristics make automated inventories particularly relevant for future metadata-assisted reporting activities under the ITS Directive and constitute one of the strongest arguments for the widespread adoption of mobilityDCAT-AP, metadata exports and machine-readable metadata interfaces across European NAPs. Moreover, they can take place at any point in time and can serve as a mechanism for NAP operators to obtain an instant status of the metadata catalogue offered, exposing gaps in data provision.

This approach nevertheless depends on the proper, complete adoption of mobilityDCAT-AP, on the metadata accurately reflecting the content of the corresponding data, and on the NAP permitting the harvesting of the metadata catalogue. Once these conditions are met, automated inventories perform well; achieving them, however, requires extra preparatory steps from NAP operators.

The following table summarises the advantages and disadvantages of the described methodologies (Table 1).

Table 1. Summary of data and metadata availability and provision assessment methodologies

Approach	Main strengths	Main limitations
Voluntary reporting mechanisms	• Flexible • Low effort • Quick to implement • Can capture contextual information and planned developments	• Depends on respondent interpretation • Requires verification and validation of answers • May contain incorrect or incomplete information
Surveys and stakeholder engagement	• Provides context • Explains underlying causes • Supports exchange of experiences • Leads to identification of practical solutions	• Resource-intensive • Less scalable • Results difficult to compare objectively
Automated inventories	• Objective • Repeatable • Scalable • Supports continuous monitoring and metadata-assisted reporting	• Fully dependent on proper and complete adoption of mobilityDCAT-AP • Requires adequate maintenance, supporting the precision and completeness of the metadata catalogue • Requires accessibility to the metadata catalogue

The methodologies presented above were applied to assess the availability of regulated mobility datasets across participating NAPs. The results of this assessment are presented in section 4 Data and metadata availability results, preceded by a Section on metadata in the NAPs.

3. Metadata in the NAPs

Metadata is central to the NAPs operations and a key enabler of data reuse. In this section we explore the main advantages from the perspective of the different stakeholders involved, when metadata is properly integrated as a building block of the NAP operations, the principles involved in metadata submission, and Application Programming Interfaces (API) as machine-to-machine communication and automated data exchange enablers.

3.1. Standardised metadata

Standardisation of metadata is a pre-requirement for interoperability, particularly when systems are required to communicate, aggregate, integrate, exchange and/or process information without ambiguity. Metadata reaches its full value when it is standardised, and in this case the foundation is provided by semantic technologies, such as controlled vocabularies with unique resource identifiers.

W3C's Data Catalogue Vocabulary (DCAT) is an RDF vocabulary designed to facilitate interoperability between data catalogues published on the Web. It enables publishers to describe datasets and data services using a standard model and vocabulary, supporting the consistent consumption and aggregation of metadata from multiple catalogues and improving overall discoverability. DCAT also supports decentralised catalogue publishing and enables federated search across distributed catalogues through a shared query structure. Aggregated DCAT metadata can additionally serve as a manifest for digital preservation [9].

The SEMIC Support Center defines an Application Profile (AP) as a data specification aimed to facilitate the data exchange in a well-defined application context. An AP re-uses concepts from one or more



semantic data specifications, adding more specificity, by identifying mandatory, recommended, and optional elements. This allows specific applications' needs and enables recommendations for controlled vocabularies to be used [10]. Controlled vocabularies as standardised sets of terms with clear definitions are essential for interoperability, integration and discovery as they guarantee consistency and reduce ambiguous interpretations.

Built upon the foundations of the original DCAT-AP v3.0.0 (latest W3C Recommendation, published 22.8.2024), the upcoming mobilityDCAT-AP v3.0.0 is designed to harmonise and standardise metadata for mobility and Intelligent Transport Systems (ITS) datasets, making it the perfect choice for NAPs within these domains.

3.2. Advantages for stakeholders

In this section some advantages for stakeholders connected to NAPs (Figure 2) are listed and grouped, highlighting some enabled functionalities.

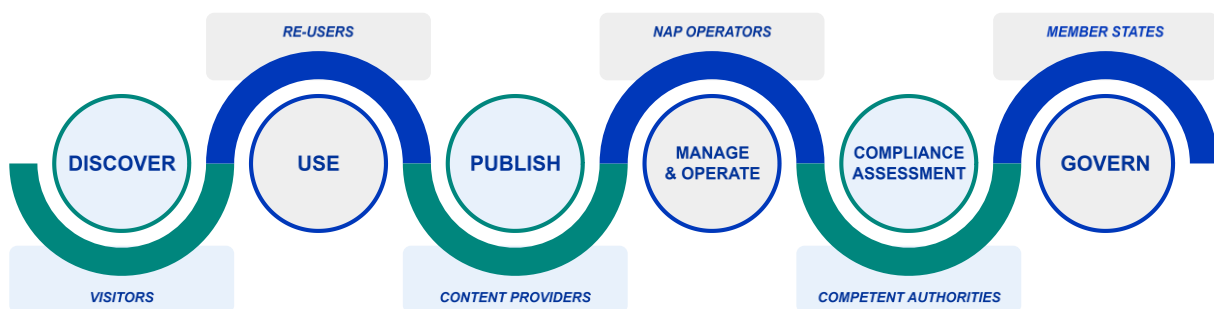


Figure 2. Actions and stakeholders

- **Visitors:** users that browse the NAP to be aware of the data offers, not downloading, re-using or integrating the data:
 - Awareness on the data content and purpose;
 - Improved discoverability and metadata catalogue navigation (particularly when metadata elements are used in search and filtering);
 - Increased trust on the NAP (clear and available information on, e.g., sources, temporal, coverage);
 - Increased comprehension of (the structure of) data availability when different NAPs make use of the same metadata structure and the visitor is consulting several NAPs separately.
- **Re-users:** Developers, ITS service providers, data aggregators, public transport operators, traffic management centers, traffic analytics companies:
 - Streamlined assessment of data suitability;
 - Faster evaluation and comparison between datasets;
 - Faster understanding on the technical characteristics of the dataset;
 - Clarity on conditions for access and usage and licensing details;
 - Facilitated communication with data providers;
 - Initial indication on the quality of the dataset (to note that more detailed information can be linked to the metadata element).
- **Content providers:**
 - Visibility of their datasets;
 - Boosting trust by providing well documented datasets;

- Reduced need for questions from developers and integrators of the data;
 - For cross-border data providers who are required to register datasets multiple times on different national NAPs, the burden of registering metadata in different formats on the same data can be reduced (and further on, by means of metadata harvesting between different national NAPs, the cross-border data provider might be asked to only register once the dataset, e.g. in the country of its main seat).
- **NAP operators:**
 - Completeness of the NAP associated with a higher maturity level;
 - Facilitated overview of the data offer, improved management and analytics;
 - Easier maintenance;
 - As datasets are better “understood” the number of requests for clarification by users is reduced;
 - Greater visibility of NAP: mobilityDCAT-AP → metadata endpoints → exposure to other transport EU platforms → datasets discoverable outside national portal → more traffic to the national portal → more recognition of the national portal.
- **Competent Authorities/National Bodies:** Organisations responsible for assessing the compliance of data/service providers with the Delegated Regulations and, in doing so, also fulfil certain stakeholder engagement tasks:
 - Improved oversight of NAP content;
 - Facilitated assessment of whether the datasets meet the requirements;
 - Automated assessment of metadata (machine-readable metadata);
 - Improved data accountability: identification of data providers;
 - Improved data traceability: versions, updates.
- **Member States:**
 - Better understanding of their mobility data landscape;
 - Improved decision making;
 - Transparency and accountability;
 - ITS reporting support.

3.3. Principles for metadata submission to the NAP

With all the advantages of metadata mentioned, it is important to also establish roles, responsibilities and specifications so that the integration in the NAPs is streamlined and facilitated.

The obligation to submit metadata associated to the datasets comes from multiple Delegated Regulations adopted under the ITS Directive, e.g., in the Delegated Regulation (EU) 2017/1926 (MMTIS), Article 3 National Access Points states: ‘Member States shall reach an agreement, in cooperation with relevant ITS stakeholders, on the metadata requirements. The data providers/holders shall ensure that they provide the metadata based on those requirements.’, or in Delegated Regulation (EU) 2022/670 (RTTI), Article 3 that reads: ‘Public and private data providers/holders shall ensure that they provide the metadata in order to allow data re-users to discover and use datasets via national access points.’

Member States are therefore responsible for establishing metadata requirements such as:

- Metadata standard to be used, in this case mobilityDCAT-AP;



- Metadata elements and their prescribed obligation level (e.g., mandatory, recommended, optional);
- The use of specific controlled vocabularies;
- Metadata quality (completeness, links check, validated...);
- Metadata submission method (manually, via forms, structured digital entry, via API...).

Data providers/holders are primarily responsible for providing metadata and ensuring that it is done in the most complete, consistent, accurate manner.

Regardless of the submission method used, the metadata provided should satisfy a small set of principles:

- it should be complete, covering at least the elements made mandatory by the national requirements;
- accurate, describing the dataset as it is published rather than as it was planned; consistent, using the prescribed controlled vocabularies so that records from different data providers/holders remain comparable;
- up-to-date, revised whenever the dataset, its distributions or its access conditions change;
- machine-readable, so that the record can be retrieved, validated and reused without manual intervention. Identifiers deserve particular attention, since persistent and unique identifiers for datasets, distributions and organisations are what allow records to be linked, deduplicated and harvested across NAPs.

Metadata can reach the NAP in several ways. The methods described below are not mutually exclusive and can be in practice combined within the same NAP, depending on the size and the technical maturity of each data holder/provider.

Manual metadata entry, in which the data holder types the record directly into the NAP interface, is the most flexible method and the one with the lowest entry barrier for occasional contributors. It is also the most error-prone and the most expensive to maintain, as values are re-typed for every dataset, free-text entries drift away from the agreed vocabularies, and updates depend entirely on the data holder remembering to make them. It remains appropriate for small metadata catalogues and for organisations that publish only a few datasets.

Structured entry (e.g., digital forms) constrains what can be submitted. Forms that expose the mandatory, recommended and optional elements defined in the national requirements, with selection lists bound to the prescribed controlled vocabularies, remove most of the ambiguity of free-text entry and allow a record to be validated at the moment it is created. This offers a good balance between the effort asked of data providers/holders and the consistency of the resulting metadata catalogue.

Automated extraction, in which the NAP derives metadata directly from the dataset or from the service endpoint, often feasible for part of a record but not for all of it. Technical and structural elements, such as the format and encoding, the standard or profile applied, the spatial and temporal coverage, the observed update frequency and the availability of the distribution itself, can often be derived from the resource, and structured exchange standards such as DATEX II, TN-ITS, NeTEx and SIRI carry enough information for this to be done reliably. Descriptive, legal and organisational elements, such as the purpose of the dataset, the responsible organisation and its contact point, licensing and access conditions, and any declared quality, cannot be inferred from the data and still must be supplied by the data holder. Automated extraction is therefore best understood as a means of pre-filling a record and of continuously checking that it still matches the published data, rather than as a replacement for submission.

Metadata harvesting moves a record between metadata catalogues instead of creating it. Where a data holder, or a regional or sectoral portal, already maintains a metadata catalogue that follows the same application profile, the NAP can collect those records and keep them synchronised, so that the metadata is maintained once and published in several places.

The same mechanism operating between NAPs is what would allow a cross-border data holder to register a dataset only once, as noted among the advantages for data providers earlier in this chapter. Harvesting assumes that the source metadata catalogue is publicly accessible, exposes a machine-readable serialisation and applies the same profile (or that a mapping is provided); where these conditions are met, it is the least burdensome method for data providers/holders and the most sustainable one for NAP operators.

Metadata quality and governance do not follow automatically from the submission method and need to be organised explicitly.

Validation is the first control point. A submitted record can be checked automatically against the application profile, verifying whether the mandatory elements are present, whether values come from the prescribed vocabularies, whether identifiers are well formed and whether the declared links resolve, with the result returned to the data holder before publication. Correcting a record at that moment is considerably cheaper than correcting a metadata catalogue afterwards.

Responsibilities should be explicit. The data holder submits the record and keeps it current; the NAP operator can validate it, publishes it and monitors that it remains resolvable; and the competent authority verifies that the resulting metadata catalogue meets the requirements set out in the ITS Directive and its Delegated Regulations.

To note that not all NAPs perform validation before publishing it. Alternatively, it can be published after a syntax check. The validation can then occur at a later stage by the NAP operator and/or the Competent Authorities/National Bodies. Quality information is in practice self-declared by the data holder/provider, so when it is published it should remain open to verification rather than just accepted at submission point.

Finally, metadata has a lifecycle. Records should be revised when the dataset, its distributions or its access conditions change, and datasets that are withdrawn should be marked as discontinued rather than silently removed, so that users and harvesting systems can tell a discontinued dataset from a temporary failure. Recording the date of the last modification, and the version of the application profile against which a record was created, makes both the maintenance effort and the age of the metadata catalogue visible.

Figure 3 presents a simplification of the “metadata lifecycle” described in this section.

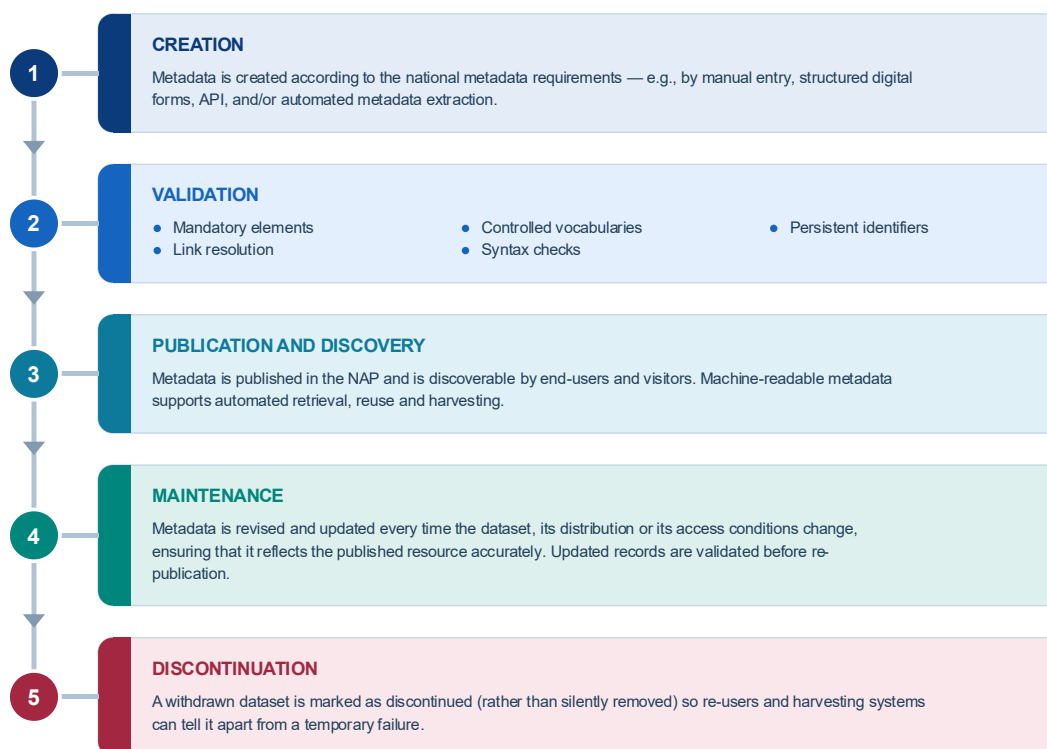


Figure 3. Simplified metadata lifecycle

3.4. Role of standardised APIs in metadata provision and retrieval

A metadata API is the interface at which two distinct roles meet and separating them clarifies what is expected of whom:

- Provision is what NAP does: it exposes its metadata catalogue at a stable, machine-readable endpoint and keeps it current, latest version.
- Retrieval is what a consumer (re-user, an application or another NAP) does: it reads that endpoint in a consistent and automated manner, to obtain the whole catalogue or a selected part of it.

Provision is a responsibility of the NAP operator, whereas retrieval is a capability offered to consumers. Where both work, discoverability improves markedly, as users, search engines and third-party tools can find the full data offer and query it for specific datasets instead of browsing a NAP manually.

What is exchanged and how it is exchanged are two separate layers, and they must not be confused. mobilityDCAT-AP is not an API; it is an application profile, which specifies which elements a metadata record carries, how they are named and which controlled vocabularies their values are drawn from. The API is the mechanism that delivers records described in that profile. Both layers need to be standardised for automated reuse to work. If an endpoint provides records in a country-specific or ad hoc format, every consumer still needs to create its own mapping. Likewise, a record that fully complies with mobilityDCAT-AP has limited value if it can only be accessed through a web page rather than a machine-readable endpoint.

This is why NAPs should adopt a standardised metadata specification from the outset, explicitly mobilityDCAT-AP.

On the provision side, the simplest form is a full export: the complete metadata catalogue serialised in a machine-readable format and published at a stable URL address, e.g., as the Belgian NAP does, accessible from <https://transportdata.be/catalog.rdf>. An export of this kind is not a demanding capability for a NAP operator to offer and keep running, and it is sufficient for harvesting and for any consumer prepared to process the whole catalogue. It is not, however, a query interface: selecting a subset, such as the datasets of one category, one region or one data holder, or only those changed since a given date, is left to the consumer, who has to retrieve everything first and filter it afterwards, for instance with a local SPARQL query.

A query API moves that selection from the consumer to the server, which then returns what was asked for. The two are complementary rather than alternatives, the export serving harvesters and bulk reuse, the query API serving interactive discovery and lightweight clients.

A full export need not arrive in a single response. Interestingly, the Belgian metadata catalogue is paged; one request returns 100 of its 192 datasets, and the rest is reached only by following a link to the next page. The paging is declared inside the returned file, as a few statements in the Hydra vocabulary giving the total number of items, the number of items per page and the address of the next page. These statements are not part of mobilityDCAT-AP, and nothing in the catalogue record points to them, so a consumer that starts from the catalogue and follows its dataset links reaches the end of the first page without any error or warning, having collected barely half of what the NAP publishes.

This is the distinction between the profile and the mechanism again, seen from the retrieval side; the profile prescribes what a record contains, but whether a consumer has obtained the whole metadata catalogue is settled by the retrieval contract. Where an export is paged, that should be stated in the documentation of the endpoint, and a harvester should be built to follow the paging rather than to assume a single complete file.

Where both layers are in place, metadata can be retrieved and processed automatically, without laborious manual work. This is what makes accurate data catalogues, connection to other national or EU-level platforms and the integration into mobility services possible in practice. It is also the precondition for the metadata harvesting described above and it works best where the source NAP provides a machine-readable endpoint and both sides apply the same application profile.

Therefore, a major conclusion that can be derived from this section is that metadata when accessible can be key to the assessment of data availability in the NAPs, allowing to go beyond a basic assessment of mere presence, enabling also to check the compliance of the offered content in for example formats used, or update frequency.

4. Data and metadata availability results

The European Union's efforts in the promotion of Intelligent Transport Systems early identified the need for the establishment of NAPs to centralise mobility related data. Such a requirement is set out in the ITS Directive and further detailed in the European Commission Action Plan [1,4].

In the present report, collecting information on the real situation, in terms of data availability in selected NAPs, was prioritised. For this purpose, a detailed collection of the categories, sub-categories and data types listed in the Delegated Regulations connected to the ITS Directive was made. The report focuses on the following Delegated Regulations and Regulation:

- Commission Delegated Regulation (EU) No 885/2013 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of information services for safe and secure parking places for trucks and commercial vehicles [5].



- Commission Delegated Regulation (EU) No 886/2013 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users [6].
- Commission Delegated Regulation (EU) 2017/1926 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of EU-wide Multimodal Travel Information Services [2].
- Commission Delegated Regulation (EU) 2022/670 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of EU-wide real-time traffic information services [7].
- Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure [8].

The NAPs selected to be assessed were directly connected to Active Partners of Task 5.1, streamlining the procedure of follow-up clarifications and enquiries. The NAPs of the following countries were considered for analysis: **Austria, Belgium, Cyprus, Czechia, France, Latvia, Norway, Slovenia, Spain and Sweden**. The links and types of the NAPs are listed in the next table (Table 2).

Table 2. List of selected NAPs, country, type and link

Country	Type	Link
Austria	Metadata directory	https://www.mobilitydata.gv.at/en
Belgium	Hybrid	https://transportdata.be/en/
Cyprus	Metadata directory	https://www.traffic4cyprus.org.cy/
Czechia	Metadata directory	https://registr.dopravniinfo.cz/en/
France*	Data platform	https://transport.data.gouv.fr/?locale=en
	Data platform	https://www.bison-fute.gouv.fr/
Latvia	Data platform	https://www.transportdata.gov.lv/en
Norway	Metadata directory	https://transportportal.no/
Slovenia	Data platform	https://nap.si/en
Spain**	Metadata directory	https://nap.dgt.es/
	Data platform	https://nap.transportes.gob.es/
Sweden	Metadata directory	https://trafficdata.se/
* France results encompass datasets available in 2 NAPs		
** Spain results encompass datasets available in 2 NAPs		

Although results collected in the case of France and Spain consider two NAPs, for textual simplification purposes only, analysis and considerations are written as France NAP and Spain NAP, except when it is important to clarify.

This deliverable presents a simplified analysis on data availability. It should be clear that for a complete assessment of data availability to take place, even the “automated inventories” approach, described previously, would need to be followed up with a verification of the data itself.

Verifying the data is not as simple as it may initially appear. Considering the “best case scenario”, where a dataset is made available on a NAP, accompanied by the proper metadata information, only when the data itself is analysed/checked, can the data be marked as available. This applies both in the case of metadata directories or data platforms.

In the first case, the link to the data needs to be followed and the dataset downloaded and compared against the metadata information. Also important to mention that not only the type/category of data is required to be made available, but the conditions under which they are provided, including the use



of harmonised standards, metadata availability, geographical coverage, accessibility, data quality, update mechanisms and reuse conditions are equally important.

In the case of data platforms, where the data is hosted by the NAP itself, the dataset or service endpoint can be retrieved directly from the NAP and compared with its metadata record. In both cases, a systematic verification method is required, combining the harvesting of the metadata catalogue with a sample-based check of the referenced datasets against the metadata declared for them, covering not only the presence of the data but also the conditions listed above.

Defining and testing such a method, building on the prototype for ITS reporting tool is foreseen in Subtask 5.1.3, and briefly introduced in Section 8.2 Next steps.

The results presented in this report are mainly based on voluntary reporting mechanisms. The simplified Excel table where respondents were asked to assess if the NAP offered data connected to the specific category/sub-category or data type listed, is presented in Appendix 1. The next table summarises the total number of categories considered per regulation (Table 3).

Table 3. Number of categories considered per regulation in the assessment

Regulation	Number of categories
MMTIS - Multimodal Travel Information Services	58
SSTP - Safe and Secure Truck Parking	14
SRTI - Safety-related Traffic Information	8
RTTI - Real-Time Traffic Information	47
AFIR - Alternative Fuels Infrastructure	44

Important to mention that a category is automatically marked in the Excel table with a ‘Yes’ if at least one sub-category within it is available (for categories structured hierarchically). The next figure exemplifies it. However, the analysis considered for such cases only the number of sub-categories (leaf categories) marked as available.

RTTI - Real-Time Traffic Information Categories	Available
1. Data on infrastructure - road network links and their physical attributes	Yes
(a) road network links and their physical attributes	Yes
(i) Geometry	Yes
(ii) Road width	No
(iii) Number of lanes	No
(iv) Gradients	No
(v) Junctions	No

Figure 4. Category marked as available based on the availability of associated sub-categories

The next sub-sections provide a detailed view of the results collected, accompanied by quantitative and qualitative analysis of the results.

4.1. Categories/types connected to the ITS Directive related regulations

The following results are based on the responses provided by the participating NAPs to the question: “Does the NAP provide datasets related to the following data categories?”

The results are presented graphically and organised according to the data categories, sub-categories and data types. The individual charts and radar chart showing the percentage of availability of



categories per regulation can be found in Appendix 2. Figure 5 and Figure 6 summarise the results for all the analysed NAPs.



Figure 5. Data categories covered per regulation (% available)

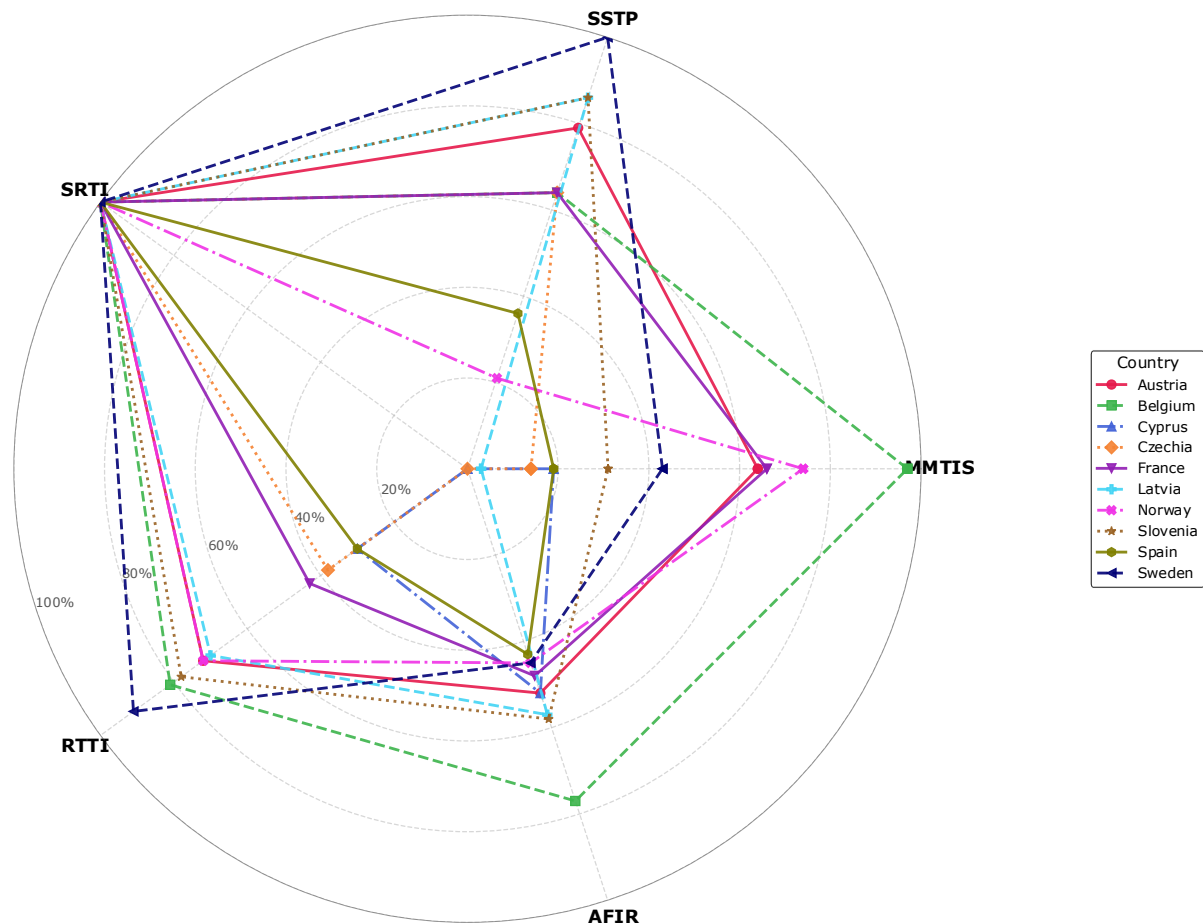


Figure 6. Radar chart of percentage of availability of categories per regulation for the selected NAPs

4.1.1. Multimodal Travel Information Services

From the previously presented Figure 5, one can conclude that MMTIS is the systemic “weak point”, ranging from 4% to 97% of data categories covered. This is not necessarily connected only with the number of categories (even though this regulation has the highest), as the regulation on multimodal travel information services is complex and broad in scope. Another worthy point to keep in mind is the exceptionally large and comprehensive range of operational purposes the regulation covers and is aimed to support.

MMTIS encompasses different modes and means of transport, covering public and private transportation services, data types (static, dynamic, observed and historical), spanning from basic location search and network topology information, timetables, transport operators and interchange data, to accessibility information, parking facilities, shared mobility services, ticketing and fare information, booking conditions, travel time estimation, environmental indicators, performance data, delays, cancellations, disruptions, real-time service status and vehicle occupancy information. It is one of the most comprehensive regulatory frameworks in scope.

The full availability of all categories listed is also highly dependent on the involvement and coordination of the wide range of stakeholders.

We also analysed if the Levels of Service (LoS) defined by the MMTIS Delegated Regulation had an influence on the availability. In Appendix 3 the individual figures detailing categories available per LoS per country are presented. Figure 7 presents the overlapped results for all countries, with each dot

representing the number of categories available, the bars illustrating the total absolute number of categories and the line marking the median, per LoS.

Graphically, a strong hypothesis is suggested: the higher the LoS, the lower the availability of the corresponding data categories. Comparing absolute counts is problematic and can be misleading, particularly because the levels contain different numbers of categories. However, the median value can give some strength to the premise as we can observe most NAPs contain datasets relating to LoS 1 (for Static, historic and observed travel and traffic data) and the median progressively declines for LoS 2, 3 and 4.

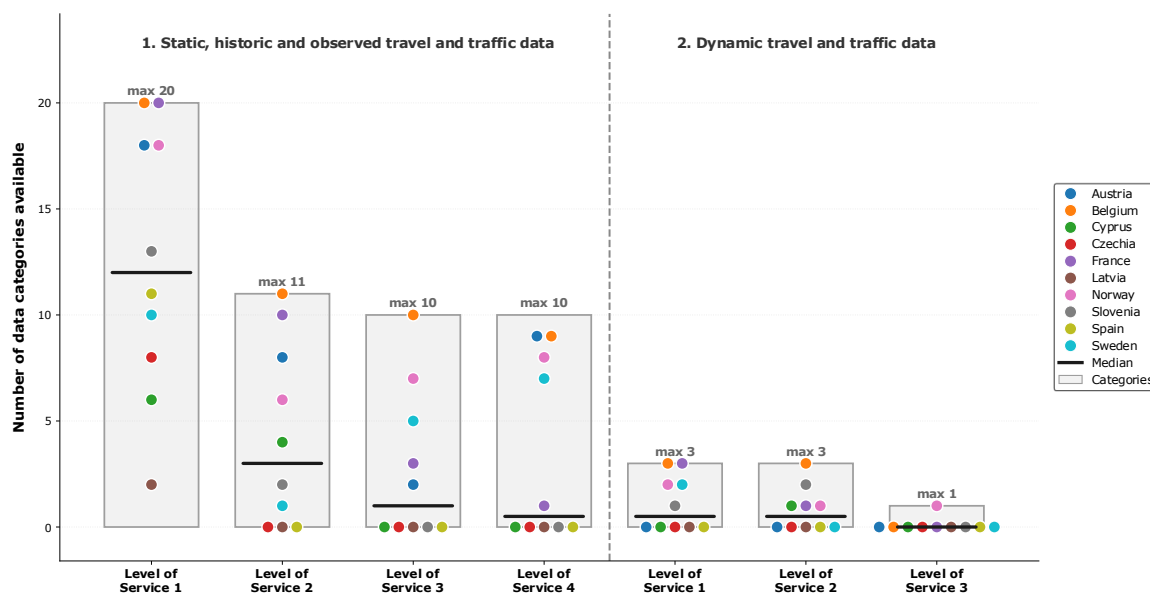


Figure 7. MMTIS data categories available by Level of Service

The interesting part is perhaps not the mathematics but the interpretation, and the progression of the MMTIS LoS can be connected to the increase of organisational complexity. When referring to static, historic and observed data, lower levels of service rely mostly on static and foundational data while higher levels increasingly require dynamic and operational data. The number of stakeholders involved in the provision of datasets connected to these categories also expands, as do the systems involved in the collection of the data itself.

Another observation can be made on the LoS 4 and its low median value registered. Most of the categories concern historical and observed travel and traffic data, which until recently continued to raise questions on how the data should be collected, shared (e.g., recommended standards) and for how long NAPs were required to make the correspondent datasets accessible. Latest standardisation developments as the CEN standard OpRa (Operational Raw Data and Statistics exchange), can be key into boosting the availability of such data in the NAPs.

It is also interesting to notice that the availability of higher LoS categories appears concentrated in a limited number of NAPs. This suggests that advanced MMTIS implementation is currently driven by a relatively small number of mature deployments rather than being widespread across participating Member States.

For dynamic travel and traffic data, the number of categories is simply too small to draw strong conclusions about the relationship between LoS and their availability.

Also, this simplified assessment does not go to the detail of analysing if all transport operators provide complete information, a distinction to keep in mind.

4.1.2. Safe and Secure Truck Parking

SSTP lists only 14 categories. Results indicate that SSTP is largely mature for static information but remains significantly less developed for real-time operational parking data (Figure 8). Unlike the other Delegated Regulations, SSTP is not primarily concerned with facilitating journey planning, traffic management or information services, but rather with improving the safety, security and operational efficiency of freight transport by ensuring that drivers have access to reliable information about parking facilities.

Static information is generally well represented, while dynamic parking availability information is generally not available. Only Spain and Sweden provide datasets connected to the availability of parking places in their NAPs. This is the one category that requires live occupancy sensing and can be considered the most useful to drivers, therefore deserving of attention and investment. Dynamic parking availability requires dedicated monitoring infrastructure, real-time data collection systems and communication interfaces. These requirements are considerably more demanding from both a technical and operational perspective.

Basic parking identification and location data are generally available, whereas information related to safety equipment, specialised services, operator details and pricing conditions exhibits greater variability between countries.

The limited availability of SSTP-related datasets in Cyprus can be explained by the fact that this Delegated Regulation is currently not applicable in the country.

		Austria	Belgium	Cyprus	Czechia	France	Latvia	Norway	Slovenia	Spain	Sweden
1. Static data	(a) Identification information of parking area (name and address of the truck parking area)	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
	(b) Location information of the entry point in the parking area (latitude/longitude)	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
	(c) Primary road identifier/direction, and primary road identifier2/direction if same parking accessible from two different roads	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
	(d) If needed, the indication of the Exit to be taken Distance from primary road (km or miles)	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
	(e) Total number of free parking places for trucks	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
	(f) Price and currency of parking places	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
2. Information on safety and equipment of the parking area	(a) Description of security, safety and service equipment of the parking including national classification if one is applied	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
	(b) Number of parking places for refrigerated goods vehicles	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
	(c) Information on specific equipment or services for specific goods vehicles and other	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
2.1 Contact information of the parking operator	(a) Name and surname of the parking operator	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
	(b) Telephone number of the parking operator	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
	(c) E-mail address of the parking operator	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
	(d) Consent of the operator to make his contact information public (Yes/No)	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available
3. Dynamic data on availability of parking places	(a) Data on whether a parking is: full, closed or number of free places which are available	Available	Available	Not available	Available	Available	Available	Available	Available	Available	Available

Available Not available

Figure 8. SSTP data category availability

Particularly for this regulation, improvements can reasonably be expected as sensing technologies become more accessible. “Data on whether a parking is: full, closed or number of free places which are available” is the only dynamic category listed and the one that directly supports and optimises time critical operational decision-making by drivers and fleet operators.

4.1.3. Safety-related Traffic Information

Datasets connected to the categories in the Safety-related Traffic Information Delegated Regulation are consistently and completely covered by all the NAPs except Cyprus. This reflects the relatively recent deployment of the Cyprus NAP, where the national road authority prioritised the



implementation of datasets associated with other regulatory requirements during the initial phases of development. The remaining SRTI datasets are currently being prepared and are expected to be published soon.

Aside from that case, complete coverage of all the categories was registered. Several factors contribute to this expected result. Firstly, road safety is of unquestionable importance and priority. Secondly, the regulation covers a reduced number of categories, which are unambiguous and sharply defined. Compared with other regulations, such as the MMTIS, the scope of SRTI is narrower and therefore simpler. Third, the listed categories (connected to the events: temporary slippery road; animal, people, obstacles, debris on the road; unprotected accident area; short-term road works; reduced visibility; wrong-way driver; unmanaged blockage of a road; exceptional weather conditions) are closely linked to the operational responsibilities of road authorities and traffic management centres, facilitating their integration in the NAPs catalogue.

The coverage of this type of information is therefore well-established and consolidated, as seen in the following figure.

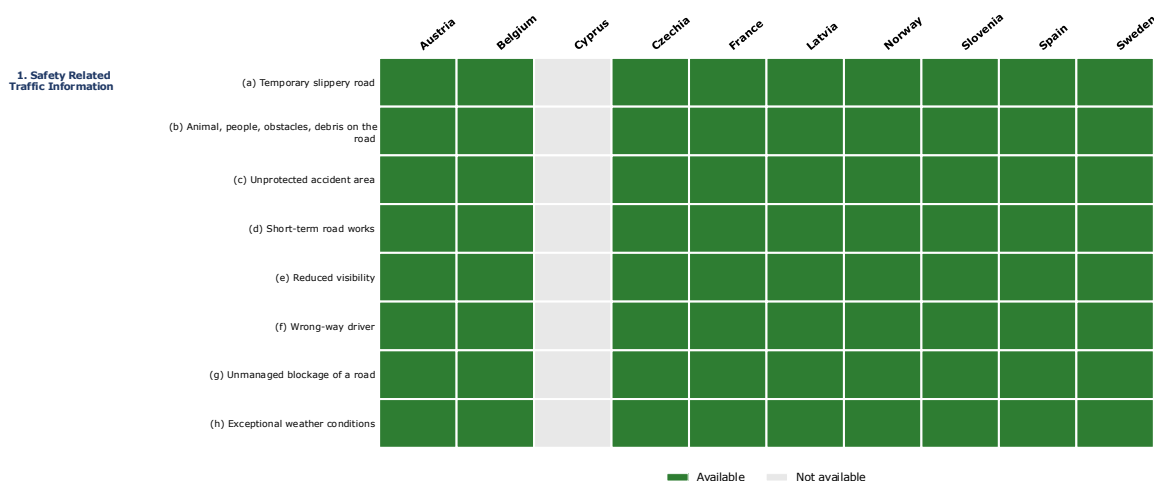


Figure 9. Availability of datasets connected to SRTI categories

An important note: Spain carried out a detailed self-assessment of its SRTI implementation against the regulation's event types: the DGT profile covers the required categories, with the exception that the `safetyRelatedMessage` attribute is not set to true in any record, and the specific `TrafficElement` types for roadblocked or carriageway-blocked conditions are not used, that use case instead being expressed through several other obstruction types. This kind of granular, self-initiated gap analysis is itself a practice worth encouraging elsewhere, since it is a manual counterpart to the automated compliance checking demonstrated for Belgium in Section 5.3.

4.1.4. Real-Time Traffic Information

RTTI represents a relatively mature regulatory domain within the European ITS ecosystem. The highest levels of availability are observed for datasets closely linked to the activities of road authorities and traffic management centres, operationally important for traffic management.

The next figure provides the mapping of the availability of datasets connected to RTTI categories.

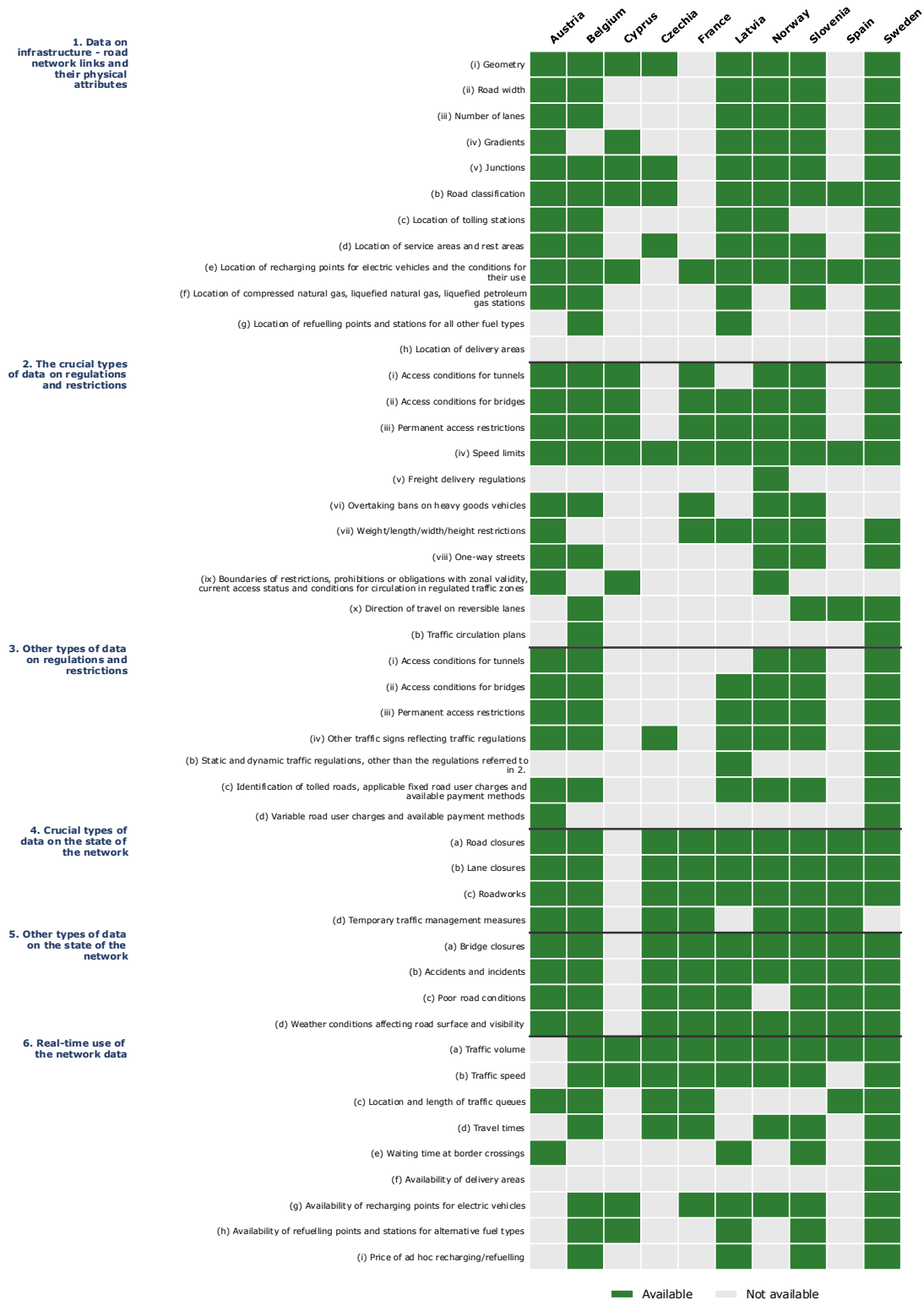


Figure 10. Availability of datasets connected to RTTI categories

The “best-performing” categories that have related datasets in the NAPs are as follows:

For 2. The crucial types of data on regulations and restrictions:

- Speed limits (10/10 NAPs)
- Permanent access restrictions (8/10 NAPs)

For 4. Crucial types of data on the state of the network:



- Road closures (9/10 NAPs)
- Lane closures (9/10 NAPs)
- Roadworks (9/10 NAPs)
- Temporary traffic management measures (7/10 NAPs)

For 5. Other types of data on the state of the network:

- Accidents and incidents (9/10 NAPs)
- Weather conditions affecting road surface and visibility (9/10 NAPs)

The universal availability of speed limit information across all assessed NAPs is likely explained by the fact that speed limits constitute a fundamental and well-standardised road network attribute that falls directly under the responsibility of road authorities. Speed limit data is relatively stable, widely maintained and operationally essential, facilitating its integration into National Access Points.

Furthermore, speed limits information supports navigation systems, route planning, traffic management, road safety applications and connected and automated driving services, making it a cornerstone dataset.

Lower availability is generally associated with categories requiring cooperation with other stakeholders or that contain operational information. This indicates that improvements may depend less on traffic management capabilities (as that information is successfully available in the NAPs) and more on strengthening data-sharing arrangements across the broader road transport ecosystem.

The “lowest performing” categories:

For 1. Data on infrastructure — road network links and their physical attributes:

- Location of delivery areas (1/10 NAPs)
- Location of refuelling points and stations for all other fuel types (3/10 NAPs)

For 2. The crucial types of data on regulations and restrictions:

- Freight delivery regulations (1/10 NAPs)
- Traffic circulation plans (2/10 NAPs)
- Boundaries of restrictions, prohibitions or obligations with zonal validity (3/10 NAPs)

For 3. Other types of data on regulations and restrictions:

- Static and dynamic traffic regulations, other than the regulations referred to in 2. (2/10 NAPs)
- Variable road user charges and available payment methods (2/10 NAPs)

For 6. Real-time use of the network data:

- Availability of delivery areas (1/10 NAPs)
- Waiting time at border crossings (4/10 NAPs)
- Price of ad hoc recharging/refuelling (4/10 NAPs)

The lowest readiness for datasets containing information on location of delivery areas and their availability can be explained by the management and governance of this type of information, which does not typically fall to national road authorities but to municipalities and local authorities. The same applies to freight delivery regulations, which only one NAP provides. This fragmentation in governance explains why such data is not yet systematically integrated into NAPs.

4.1.5. Alternative Fuels Infrastructure



As one of the most “recent” regulations, from September 2023, the inclusion of AFIR related data types in the assessment was based on the growing relevance of alternative fuels infrastructure data within the European mobility panorama, and an interest in how NAPs are already integrating datasets containing this information in their catalogue. Because of AFIR’s recent entry into force, countries are still deploying the physical infrastructures, systems and mechanisms for data collection processes, and analysing, collecting and establishing the network of relevant stakeholders.

The results indicate that most NAPs have started to make available the core charging infrastructure information, but the more advanced, operational data types remain absent.

Looking at Figure 11, which can be described as an availability heatmap, AFIR displays a very different pattern from the other regulations. Different than SRTI, where availability is complete and consistent, or MMTIS, where a few countries achieve very high coverage while others lag considerably, AFIR is characterised by relatively uniform but moderate levels of adoption.

Lowest-performing AFIR data types, with very low availability (0–3 NAPs):

For (a) Static data for publicly accessible recharging and refuelling infrastructure:

- Additional information about payment providers accepted (2/10 NAPs)
- Contract-based (subscription) payment option (2/10 NAPs)

For (b) Further static data for publicly accessible recharging infrastructure:

- Mobility service providers offering contract-based recharging (0/10 NAPs)
- Plug-and-charge (0/10 NAPs)
- Smart recharging services (0/10 NAPs)
- Electricity supplied is 100% renewable (2/10 NAPs)

For (c) Further static data for publicly accessible hydrogen refuelling infrastructure:

- Hydrogen state (2/10 NAPs)
- Hydrogen pressure (3/10 NAPs)
- Daily cumulative capacity (1/10 NAPs)
- Hydrogen supplied is 100% renewable (2/10 NAPs)

For (d) Further static data for publicly accessible refuelling infrastructure for liquified methane:

1. Liquified methane supplied is 100% renewable (1/10 NAPs)
2. Further static data for publicly accessible refuelling infrastructure for alternative fuels

For (g) Further static data for publicly accessible refuelling infrastructure for alternative fuels:

3. Limited amount of hydrogen available (1/10 NAPs)

The weakest AFIR data types are connected not so much to the identification, location or description of charging infrastructure as to advanced characteristics of the stations (e.g., charging capabilities as plug-and-charge or smart recharging), commercial information, and to dynamic operational data. Dynamic data types mostly depend on the coordination of a broad stakeholder group, which when inefficient contributes to the lack of availability of that type of data.

AFIR data originates from infrastructure operators, charging point operators, refuelling station operators, energy providers and mobility service providers, requiring also live connections to operational systems, which increases the difficulty on its availability. However, its importance can be viewed as paramount if we consider the operational use of it by drivers. While the absence of some

data types may prove to be an inconvenience for users, the absence of others severely reduces the use of the services.

Important to state that the AFIR-related datasets are not yet available in the Czech NAP because the Road and Motorway Directorate (ŘSD) is still finalizing a unified AFIR data integration and publication framework, which has been delayed. In the meantime, AFIR data exist only in fragmented form across other national portals, mainly under the Ministry of Industry and Trade's reporting system.



Figure 11. Availability of datasets connected to AFIR data types

4.2. Summary about data availability results

To draw more useful conclusions from the results when considering all regulations, Cyprus replies for SRTI and SSTP are not considered in this section, nor are Czechia's replies related to AFIR. The justification for the non-availability or even non-applicability of the regulation is provided in the correspondent sections Safe and Secure Truck Parking, Safety-related Traffic Information and Alternative Fuels Infrastructure. The ten NAPs assessed here are the active Task 5.1 partners rather than a random or complete sample of EU Member States, so the figures below describe this group and should not be read as representative of NAPs generally.

The mean and median for the results are examined below, allowing not only to compare how available are datasets connected to the regulations in the NAPs but also how evenly is this availability distributed.

Mean value corresponds to the average availability and the median value corresponds to the middle value when replies are ordered from lowest to highest. The analysis benefit from considering both, particularly for assessing the gap between them and drawing conclusions on the harmonisation between NAPs.

When the mean value is above the median, it can indicate that a strong performer NAP is lifting an otherwise weaker result. This is clearest for MMTIS: dropping any single NAP from the sample leaves the mean above the median in every case. For SSTP and AFIR the same reading is less safe, since their mean-median gaps are smaller than one category and change sign if a single NAP is set aside.

Median above mean, as in the case of RTTI: 71% vs 61%, indicates the opposite, i.e., most NAPs do reasonably well, with a small group of "lower performers" lowering the value.

With a mean value of 43% and median value of 37%, MMTIS presents a considerable gap, $43 - 37 = 6$ pp. A direct conclusion would be to state that for our sample, the typical NAP among the ten assessed covers only 37% of the data categories listed. Given the relevance of the regulation and its intended purpose of ensuring that the relevant mobility data are available, 37% is an extremely low and far from ideal value. Moreover, it is probably one of the most "unfair" results, considering that countries are actively engaged at several levels to fulfil MMTIS requirements and the effort is not yet reflected, when analysing the presence of datasets on the NAPs.

Furthermore, as stated, the presented availability assessment is simplified. If other requirements were added to the analysis (data formats, standards, metadata provision, data quality, accessibility, geographical coverage, timeliness and interoperability) the number of positive answers for available and compliant datasets would inevitably be lower. Such conclusion extends to the remaining regulations considered.

An important remark is that MMTIS is one of the most "ambitious" regulations, aimed to make data related to the entire mobility ecosystem accessible, operational and interoperable.

SSTP shows a smaller gap between mean and median than MMTIS, at 67% and 64% respectively. Although not all categories are covered by datasets available in the NAPs, the typical NAP already offers 64% of them.

SRTI results are 100% for both mean and median values, indicating that datasets connected to all categories mentioned are available in all the studied NAPs. For no other regulation these results are achieved.

RTTI is the only regulation when we see the mean value lower than median. Six of ten NAPs reach or exceed 70%, and Sweden reaches 91%. The average is pulled down by Cyprus and Spain at 30%, Czechia at 38% and France at 43%.

AFIR's mean and median are almost identical (53% and 52%), confirming a clustered distribution, more evenly distributed across participating NAPs.

A cross-regulation reading suggests that scope, meaning the number of categories a regulation defines, is among the stronger predictors of coverage, though not sufficient on its own to explain it. SRTI defines eight categories and reaches the highest availability of any regulation, while MMTIS defines fifty-eight and records the lowest mean coverage, at 43%.

A dispersion chart, presented in Figure 12, allows us to focus not on how many categories are available but on how consistent is implementation across the NAPs for each of the regulations. Table 4 lists the mean, median and interquartile range underlying this comparison. For small data sets without outliers, the range provides a quick, interpretable measure of spread.

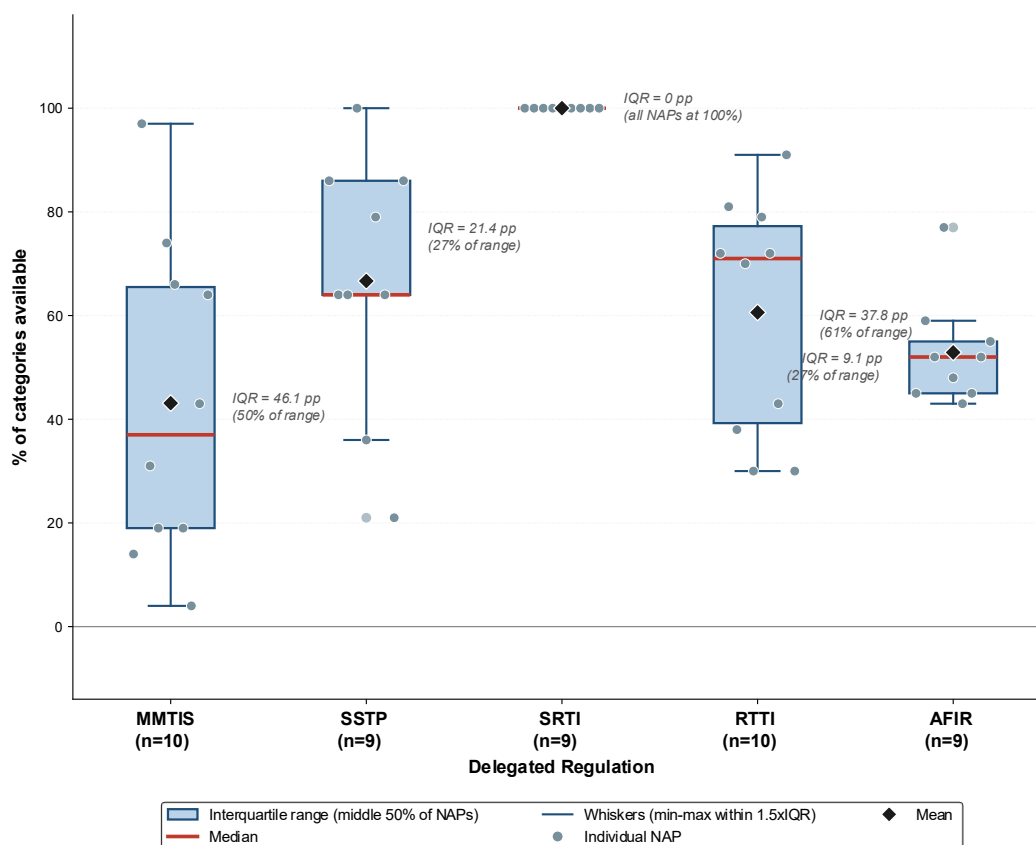


Figure 12. Dispersion of categories available per regulation

The most fragile is MMTIS, with a 93-percentage point (pp) gap, 3.6% to 96.6%, and the lowest floor of all regulations. An analysis of the interquartile range (IQR) shows where the "normal" 50% of countries sit, excluding extremes. A large IQR indicates that central values are widely spread, while a small IQR indicates that central values are tightly clustered.

MMTIS has an IQR of 46 pp, representing 50% of the total range, meaning the scatter is not driven by the extremes and that the remaining NAPs are also dispersed. This suggests that MMTIS "varies" considerably between NAPs. While some NAPs have already integrated substantial parts of the MMTIS categories in their offer, others remain at an early stage. The differences likely reflect variable levels

of multimodal transport data integration, public transport digitalisation and onboarding of transport operators rather than differences in NAP maturity alone.

SSTP has an IQR of 21 pp, representing 27% of the total range. This suggests that most NAPs cluster relatively close together, with fragmentation driven primarily by two extremes.

SRTI presents an IQR of 0.00 pp and no observable implementation variability, as all NAPs reported all categories included. The absence of variability indicates complete harmonisation.

RTTI has an IQR of 38 pp, representing 61% of the total range. This indicates that variation is not caused by extreme performers but is distributed across the central group of NAPs as well.

AFIR has an IQR of 9 pp, representing 27% of the total range. This indicates that most countries cluster within a relatively narrow band of implementation levels. The limited dispersion suggests that AFIR faces a common implementation challenge across NAPs rather than significant differences between countries.

The observed variability varies across regulations. MMTIS and RTTI show strong heterogeneity between NAPs, while SSTP and particularly AFIR exhibit a much stronger degree of convergence. SRTI stands apart as a fully harmonised domain.

Table 4. Analysis of mean and median and interquartile range

	Mean and median	Interquartile range (IQR)
MMTIS	High performers pulling the average up	Broad dispersion across NAPs
SSTP	Relatively balanced	Variability is driven by a few outliers
SRTI	Perfect alignment	No observable variation across NAPs
RTTI	Low performers pulling the average down	Broadly dispersed
AFIR	Symmetric distribution	NAPs cluster around similar number of categories available

However, as pointed out before, domain maturity, the nature of the categories (e.g., dynamic data, observed data, historical data) and the dependency on multiple stakeholders can possibly contribute to lower availability.

Let us consider how accurate is to state that dynamic/real-time data can be a major factor, and observe Figure 13, where the grey bars represent the average percentage of categories of static nature available with the indication of the average number/total number of categories indicated below, and the red bars have the same meaning for dynamic/real-time categories.

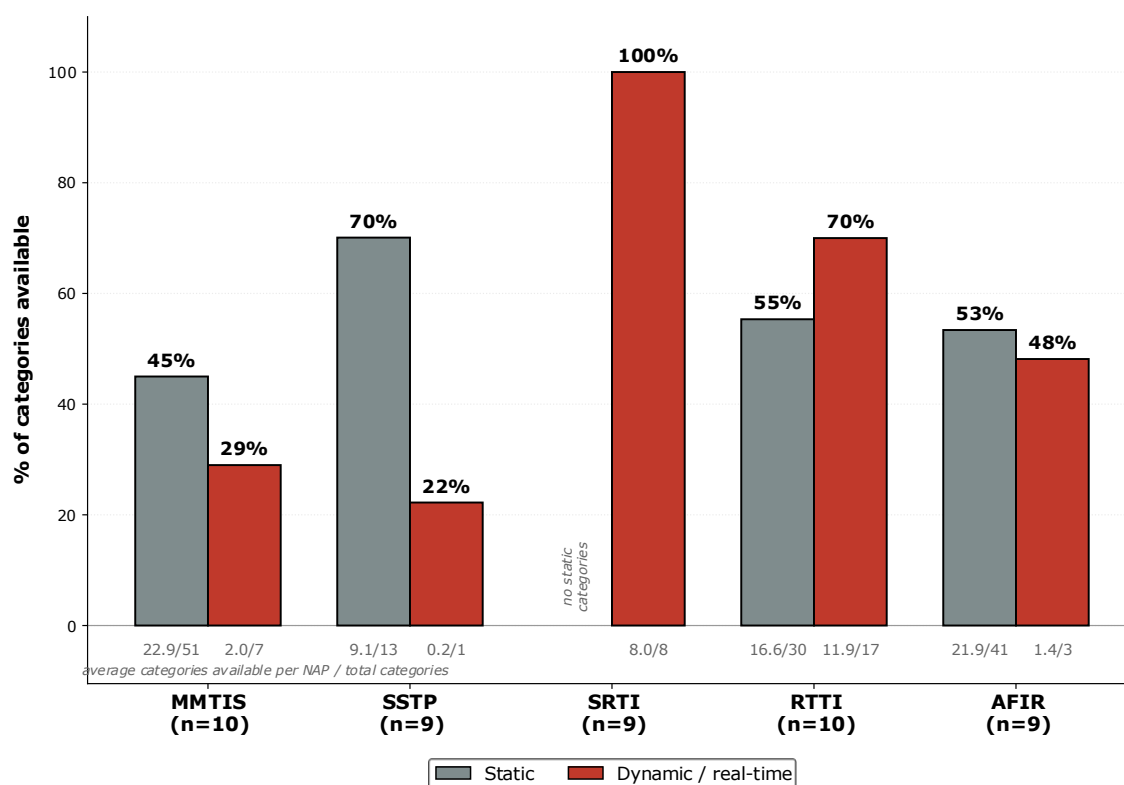


Figure 13. Static vs dynamic, percentage of categories available

When each of the five regulations is given equal weight, dynamic categories average $(29+22+100+70+48)/5 = 53.8\%$ against $(45+70+0+55+53)/5 = 44.6\%$ for static.

This observation remains valid even after accounting for the substantial differences in scope by calculating a category-weighted average, where each regulation is weighted according to its number of assessed categories (ranging from 8 categories for SRTI to 58 for MMTIS), with for dynamic **65.5%** vs 51.4% for static.

Note: Category weighted average (%) = $\Sigma (\text{Regulation average} \times \text{Number of Categories}) / \Sigma (\text{Total Categories})$

Both comparisons should be read with one limitation. SRTI defines no static categories at all, and that absent value enters the equal-weighted static average as a zero, which depresses it. Excluding SRTI from both groups reverses the ordering: static rises to 55.8% and dynamic falls to 42.3%. The category-weighted figures are less exposed to this, since they weight by the number of categories rather than by regulation, but SRTI still contributes eight of the thirty-six dynamic categories and all of them are available. What can be concluded is therefore narrower than either figure suggests on its own: the evidence does not support the expectation that dynamic categories are systematically less available, nor, once SRTI is set aside, does it support the reverse. Whether a category is static or dynamic is not on its own a reliable predictor of its availability in the NAPs.

Worthy to analyse then, for each regulation, which are the critical outliers, i.e., categories that are underrepresented. Figure 14 lists the MMTIS categories that are less available in the NAPs.

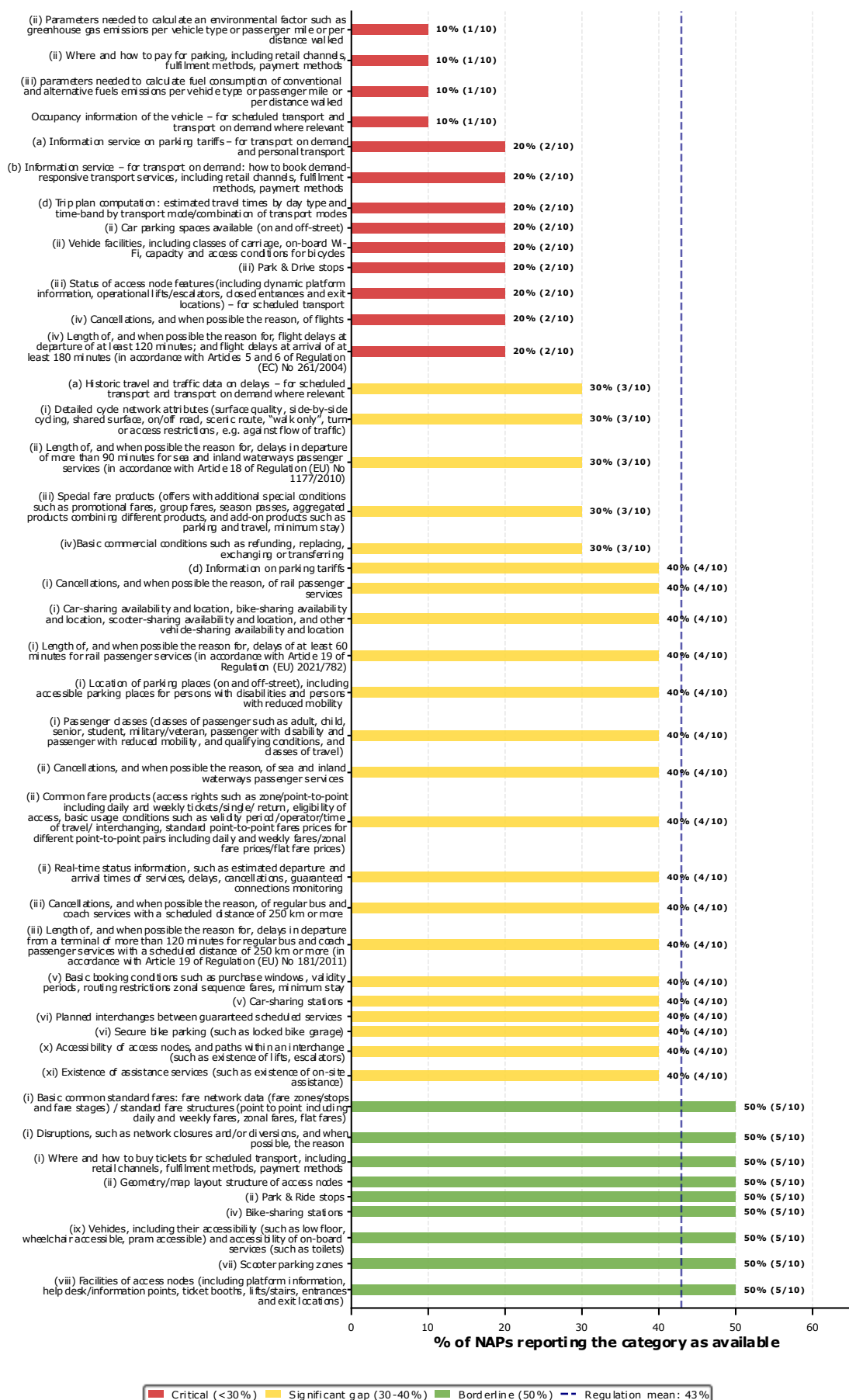


Figure 14. Category gap analysis, critical outliers for MMTIS

Due to the extensive number of categories, we can focus the analysis on the categories labelled as “critical” (Figure 15), i.e., those that only 1 or 2 NAPs confirmed coverage, and retrieve some possible causes for the lack of availability.

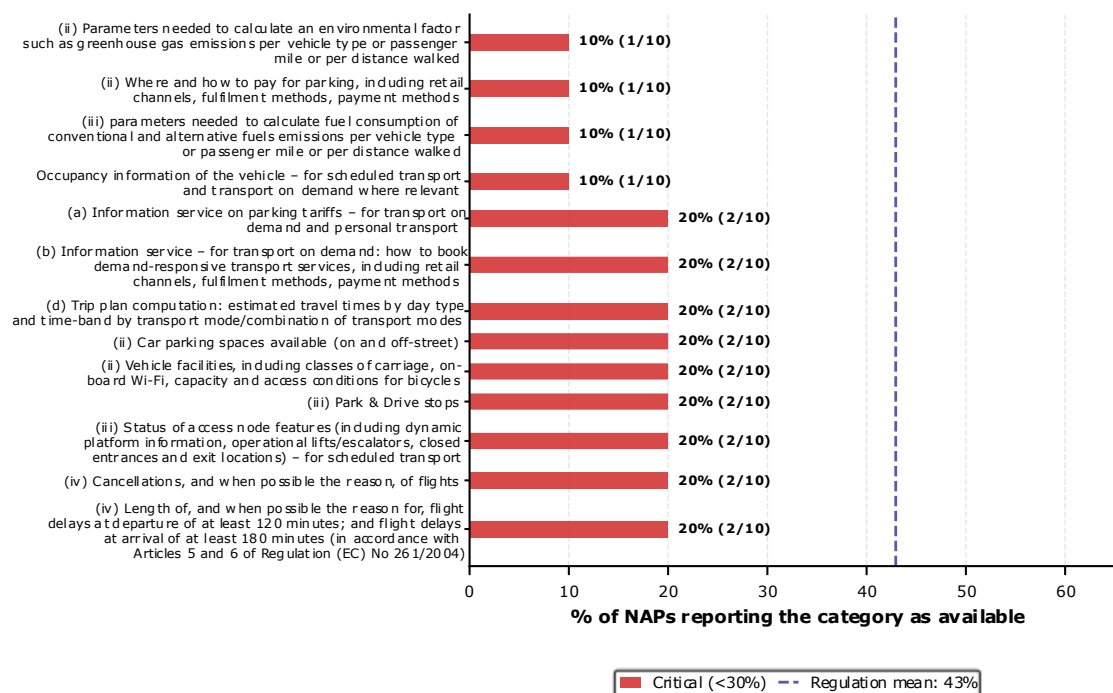


Figure 15. MMTIS critical categories

13 of the 58 categories are available in fewer than 30 % of the 10 assessed NAPs. None of the categories are listed under of Level of Service 1.

Probable causes:

- Stakeholder/Sectorial integration:** 9 of the 13 categories depend on stakeholders outside the traditional road and public transport data ecosystem, including parking operators, demand-responsive transport operators and airports.
- Derived data:** environmental factors, fuel-consumption parameters and estimated travel times require modelling and calculation before being published on NAPs.
- Advanced service information:** Several categories relate to operational services, booking systems, occupancy levels, facility status and pricing information, which require mature digital services and data-sharing arrangements.

For SSTP, only 2 categories fall below the 50% threshold of the assessed NAPs. Both describe **operational information**, which requires stakeholder integration. Category (f) introduces pricing information (**commercial/business dimension**) that can be considered sensitive and create further barriers to publication (Figure 16).

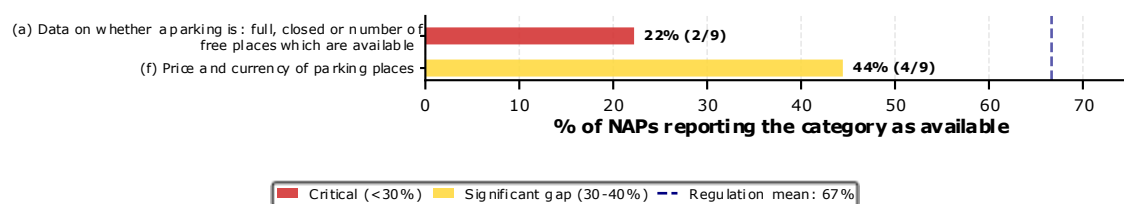


Figure 16. Category gap analysis, critical outliers for SSTP

For RTTI, 17 of the 47 categories display low availability (Figure 17). If we focus mainly on those with availability reported only in 1 or 2 NAPs, we can identify the following barriers:

- Municipal ownership and stakeholder dependency:** some categories, e.g., availability of delivery areas, location of delivery areas, freight delivery regulations and traffic circulation plans, are usually managed at a municipal level, therefore dependent on cooperation with local authorities and the existence of mechanisms to streamline the aggregation of these data for publication on the NAPs.
- Digitalisation maturity and lack of the underlying digital dataset:** Traffic circulation plans can be lacking in harmonisation due to different interpretation of the inherent definitions and requirements across Europe. Combined with the need to digitise these plans, to then be published correctly in the NAPs may be causing the low score for this category.
- Operational information:** Variable road user charges and available payment methods are typically managed by concessionaires and tolling operators.
-

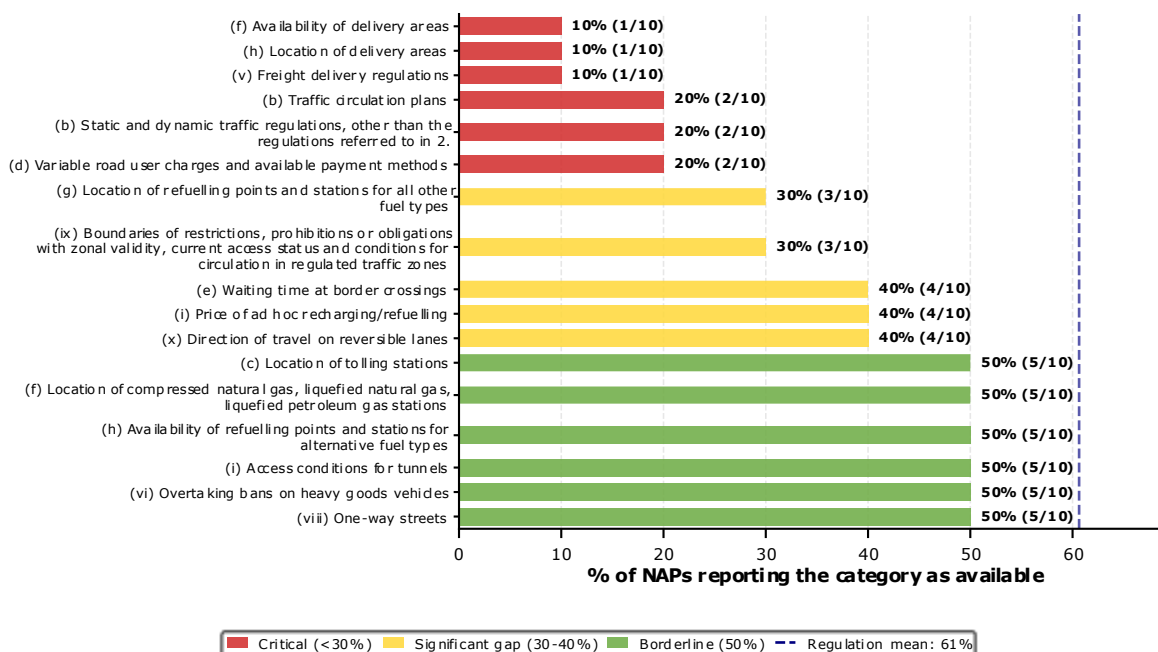


Figure 17. Category gap analysis, critical outliers for RTTI

The lowest-performing RTTI categories (similarly to MMTIS) can be mapped to information outside the traditional responsibilities of road authorities and traffic management centres. Limited availability can then be more connected to **stakeholder integration**, **local governance structures** and the need to incorporate commercial or logistics-related information into NAPs.

For AFIR 19 of the 44 categories can be considered gaps. AFIR presents a different scenario, as the weakest categories are connected to advanced infrastructure operational attributes (Figure 18). Possible causes:

1. **Maturity of the infrastructure:** For some specific types of infrastructure, related to hydrogen and liquefied methane refuelling, the low availability of the infrastructure itself may cause the lack of data.
2. Emerging advanced services as smart recharging services or plug and charge are still growing, therefore it might be again the case of **service deployment maturity** influencing the low availability connected to these categories.
3. **Extended, detailed and derived information:** Categories such as renewable energy origin, associated user services, and accessibility-related information are not usually part of the core charging or refuelling infrastructure register. Their publication therefore requires additional collection, verification and maintenance efforts, which may explain their lower availability.
4. **Commercial and pricing information:** Categories related to pricing, payment and subscription payment options are very operator-specific and may then be less systematically shared through NAPs than technical infrastructure attributes.

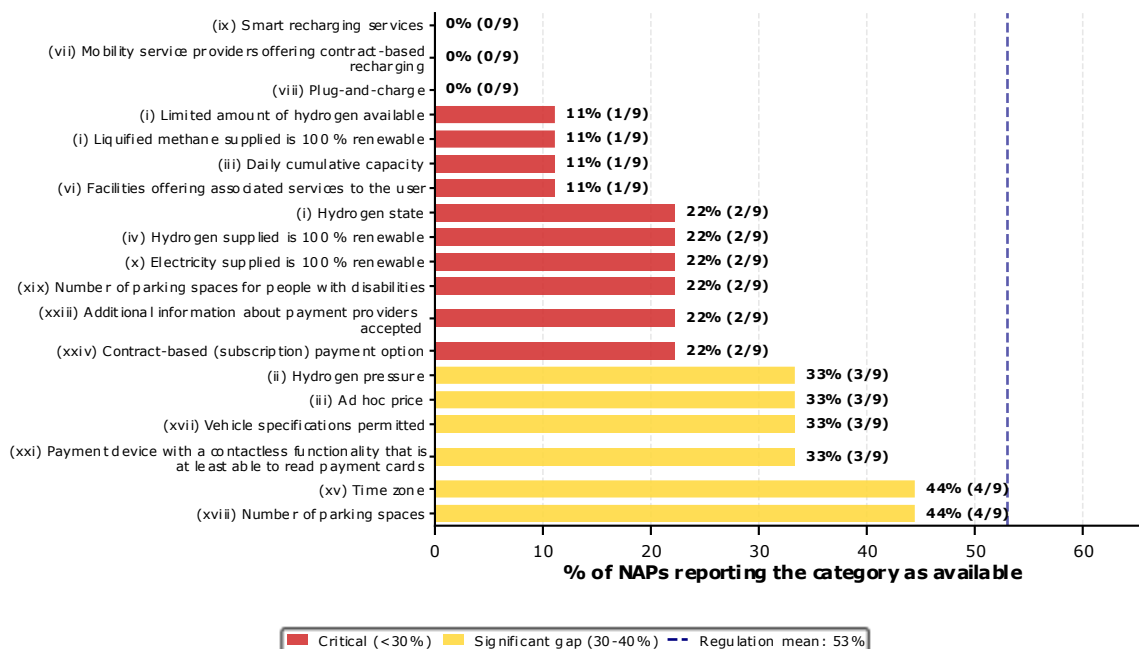


Figure 18. Category gap analysis, critical outliers for AFIR

From this more detailed analysis of the least available categories, for all regulations, the following recurring challenges can be identified:

- Stakeholder integration
- Governance fragmentation
- Operational information
- Commercial and pricing information
- Digitalisation maturity
- Derived information
- Service maturity
- Infrastructure maturity

Based on the 82 categories available in 50% or fewer than the assessed NAPs and the recurring challenges identified, a graph mapping the implementation effort and the impact on availability can be observed in Figure 19. No challenge was mapped in the low effort zone due to the number of stakeholders involved. The implementation effort was based on expert judgement.

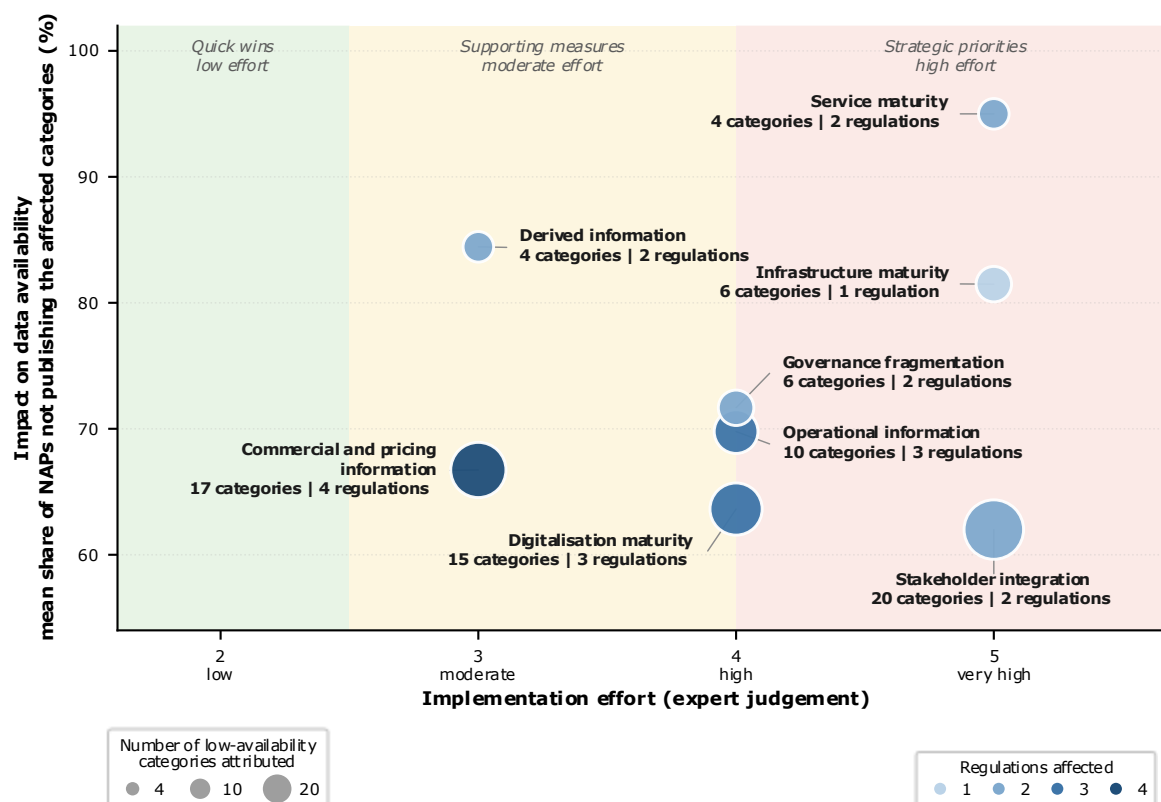


Figure 19. Implementation effort and the expected impact on data availability

The analysis also assisted in the identification of measures to improve data availability, detailed in Section 7 Actionable recommendations for Member States.

4.3. Metadata availability

Every NAP in the sample publishes metadata, but the six metadata questions of the Task 5.1 questionnaire show that publishing it and making it retrievable are two different things. The answers are reproduced in full in Figure 20, and condensed into a single score per NAP in the following section.

These are the operators' own answers, taken from the returned questionnaires; WG5.1 compiled and scored them but did not re-verify each one against the live catalogues. That distinction matters for how the figures are read, and Chapter 5 examines it directly: for Belgium, the one NAP whose published catalogue is assessed in detail, five of the six answers are confirmed by the catalogue and the sixth, on completeness, is partly confirmed. The answers are therefore treated here as reliable but not independently audited.

	Is metadata available?	Complete & consistently applied?	Which metadata standard is used?	Can users export the catalogue?	Catalogue publicly accessible?	API for accessing metadata?
Austria	Yes	Yes	mobilityDCAT-AP	Yes	Yes	Yes
Belgium	Yes	Yes	mobilityDCAT-AP	Yes	Yes	Yes
Cyprus	Yes	Partially	mobilityDCAT-AP	No	No	No
Czechia	Yes	Yes	National/Custom	No	No	No
France — Bison Futé	Yes	Yes	No formal specification	No	No	No
France — Transport.data.gouv.fr	Yes	Partially	No formal specification	Partially	Yes	Yes
Latvia	Yes	Yes	mobilityDCAT-AP	Yes	Yes	Yes
Norway	Yes	No	DCAT-AP	No	No	not answered
Slovenia	Yes	Yes	mobilityDCAT-AP	No	Yes	No
Spain	Yes	Yes	National/Custom	Yes	No	No
Sweden	Yes	Yes	mobilityDCAT-AP	No	No	No

■ Yes
 ■ Partially
 ■ No
 ■ Not answered

Figure 20. NAP metadata practice, reported answers by question

The pattern is consistent. Metadata is available at every one of the eleven entries, and eight describe it as complete and consistently applied. Seven use a profile from the DCAT family, six of them mobilityDCAT-AP itself; two use a national or custom specification and two report no formal specification at all.

Access is where the answers diverge: four NAPs allow the catalogue to be exported and one partly, five make it publicly accessible, and four offer an API. The same Member State can answer differently for different services, as the two French endpoints do on four of the five scored questions, agreeing only on the standard. Describing data well is now common practice; exposing those descriptions so that another system can fetch them is not.

4.4. Metadata maturity index

The metadata maturity index condenses the answers in Figure 20 into a single score per NAP, so that progress can be compared across countries. It follows the logic of the Quality dimension of the European Commission's Open Data Maturity assessment [11], which likewise scores compliance with DCAT-AP and its controlled vocabularies, the completeness of dataset descriptions, and the availability of an API, and likewise expresses the result as a percentage of the maximum. The index applies that logic to the mobility domain, substituting mobilityDCAT-AP for the generic profile.

Two limits follow from this and should be read with the scores. The index is not comparable with a country's Open Data Maturity score: it is built from five questions rather than that assessment's full instrument, and it describes a NAP rather than the national open data portal, which in most Member States is a different service. It also stops at what the questionnaire observes about published metadata; the organisational dimensions of maturity, governance, stewardship, and whether metadata quality is monitored systematically, which would require additional enquiry with NAP operators.

The questionnaire puts six metadata questions to each NAP. The first, whether metadata is available at all, is excluded: every NAP in the sample answered Yes, so it separates nobody and would raise all scores equally. The remaining five are scored as set out in Table 5.

Table 5. Scoring of the five metadata questions behind the maturity index

Question	Scoring
Is the metadata complete and consistently applied?	Yes 1.0 Partially 0.5 No 0.0
Which metadata standard is used?	mobilityDCAT-AP 1.0 DCAT-AP 0.5 National or custom 0.25 No formal specification 0.0
Can users export the metadata catalogue?	Yes 1.0 Partially 0.5 No 0.0
Is the metadata catalogue publicly accessible?	Yes 1.0 No 0.0
Does the NAP provide an API for accessing metadata?	Yes 1.0 No 0.0

The five scores carry equal weight. The index is their mean, expressed as a percentage of the maximum, so a NAP answering Yes throughout scores 100%. A question left unanswered is excluded from both the sum and the divisor rather than counted as zero, which is why Norway is scored over four questions instead of five. France is counted twice, as Bison Futé and as Transport.data.gouv.fr, because it reported two separate metadata endpoints; the remaining Member States each returned one. The underlying answers are self-reported by the NAP operators; the weighting and the resulting index are WG5.1's, not theirs. The results are shown in Table 6.

Table 6. Metadata maturity index ranked by NAP

NAP	Index
Austria	100%
Belgium	100%
Latvia	100%
France — Transport.data.gouv.fr	60%
Slovenia	60%
Spain	45%
Sweden	40%
Cyprus	30%
Czechia	25%
France — Bison Futé	20%
Norway	12%*

* Norway is scored over four questions; the API question was left unanswered.

The mean across the eleven entries is 54% of the maximum, ranging from 100% for Austria, Belgium and Latvia to 12% for Norway. A single country can occupy both ends of that range: the two French endpoints score 60% and 20%, which is evidence that maturity attaches to the metadata endpoint rather than to the Member State.

Where NAPs lose points is consistent across the sample. Completeness scores highest, at 82% on average, and standard adoption reaches 64%, with six of the eleven entries already using mobilityDCAT-AP itself. The lower half of the index is entirely about reach; whether the catalogue can be exported (41%), whether it is publicly accessible (45%), and whether an API is offered (40%). The

pattern is that most NAPs have described their data adequately and to a recognised profile, but fewer have made those descriptions retrievable by machine. Norway, the lowest scorer, is the clearest case: it has adopted a real standard in DCAT-AP, yet answered No to completeness, export and public accessibility alike, so only the partial credit for the standard remains.

5. Metadata based assessment

5.1. Automated versus manual reporting

The preceding chapters assess data and metadata availability from what NAP operators report about themselves. Chapter 2 describes three ways of collecting that report: voluntary reporting mechanisms, surveys and stakeholder engagement, and automated inventories. The first two depend on a person answering a form. The third reads the metadata catalogue that the NAP already publishes. This chapter examines what changes when the third is used in place of the first two.

The two approaches differ in the kind of statement they produce. A questionnaire records claims. For each of the 171 data categories drawn from the annexes of the Delegated Regulations the operator states Yes or No. That set is fixed and identical for every NAP questionnaire. A metadata catalogue records evidence instead, a body of dataset descriptions, each of which can be followed to a URL and checked.

The two approaches are specific. A questionnaire answer cannot be verified, and it may record intent, or (operators) memory, rather than what is published. A metadata catalogue cannot be wrong about what it contains, but a category that is genuinely available and not described in it stays invisible to an automated reading. How much of the manual report the automated one can carry therefore depends on how completely the catalogue is attributed and how far the controlled vocabulary reaches, and both of those are improving.

5.2. mobilityDCAT-AP based automated metadata assessment

An automated assessment reads a single input, the NAP's metadata catalogue, serialised according to mobilityDCAT-AP and retrieved from a published endpoint. Retrieval is not always a single request.

A catalogue may be paged, in which case the paging is declared inside the returned file and must be followed, as Section 3.4 describes. A consumer that stops at the first response only partially assesses the catalogue.

The assessment then must bridge two vocabularies. The 171 data categories are phrased in the language of the Delegated Regulation annexes, while the metadata catalogue describes datasets using the mobilityDCAT-AP data content category vocabulary.

The comparison here uses version 1.1.1, the Mobility Theme concept scheme, which defines 19 data content categories and 102 sub-categories. Establishing a category from the catalogue therefore requires a vocabulary term of matching meaning. That comparison is a property of the specification rather than of any individual NAP, and it is made once against the vocabulary as published. To note, that NAPCORE's task 4.4 is now enlarging the controlled vocabularies to better represent the data categories listed in regulations. This improvement will be key for quality of data availability results.

Each category then falls into one of three states. There is an exact match with a metadata dataset, meaning the vocabulary has a term for the category and a dataset in the metadata catalogue carries it. There is a match in the vocabulary that no metadata dataset uses. Or there is no match in the

vocabulary at all, and the catalogue describes the data at its own granularity, through a broader term or through none.

The state of a category depends only on the vocabulary and on the catalogue. What the operator answered for it, or whether they answered at all, has no bearing on the result. An automated assessment is therefore not a check of the questionnaire against itself, and it can be produced for a NAP that never returned one.

5.3. Use case: Belgian NAP

Belgium is examined here because it supplied both a completed Task 5.1 questionnaire and a publicly retrievable mobilityDCAT-AP catalogue, which allows the two instruments to be compared on the same NAP. Both were taken as they stand on 31 July 2026, and neither was corrected for the purpose. The metadata catalogue holds 192 datasets and 218 distributions from 73 distinct organisations and needed two requests to be retrieved in full. Table 7 sets out the six metadata questions and what the catalogue shows for each.

Table 7. The metadata questions of the Task 5.1 questionnaire, answered from the Belgian metadata catalogue

Questionnaire question	Answer	What the metadata catalogue shows
Is metadata available?	Yes	Confirmed; 192 dataset records retrieved
Is the metadata complete and consistently applied to all the datasets?	Yes	Partly confirmed; see the consistency checks below
Which metadata standard is used?	mobilityDCAT-AP	Confirmed; mobilityDCAT-AP terms in use throughout
Can users export the metadata catalogue?	Yes	Confirmed, but the export is paged, as noted in Section 3.4
Is the metadata catalogue publicly accessible?	Yes	Confirmed; retrieved without authentication
Does the NAP provide an API for accessing metadata?	Yes	Confirmed; a paged HTTP endpoint

The header fields follow from the same file. The NAP link is the catalogue's own homepage, and the hybrid type Belgium reports is confirmed by where the distributions point: 66 of the 251 access and download URLs resolve to the NAP itself and 185 to external hosts. For this part of the assessment the catalogue does not merely reproduce the questionnaire. It improves on it, because each answer arrives with its evidence attached.

Applying the three states to the 171 data categories gives the result in Table 8.

Table 8. Data categories of the Task 5.1 questionnaire, by what the Belgian mobilityDCAT-AP catalogue can establish

Regulation	Categories	Exact match with BE metadata dataset	No BE metadata dataset uses it	No match in vocabulary
MMTIS	58	28	11	19
SSTP	14	0	1	13
SRTI	8	1	1	6
RTTI	47	6	35	6
AFIR	44	1	0	43
Total	171	36 (21 %)	48 (28 %)	87 (51 %)

In aggregate, 21 % of the categories present in the Delegated Regulations have an exact match with a Belgian metadata of minimum one dataset, 28% correspond to a vocabulary term that exists but that no dataset is tagged with, and the remaining 51 % have no match in the vocabulary at all. The distribution is very uneven between regulations, and the two shortfalls have entirely different causes.

The middle state repays a closer look, and it is easiest to see in a single category. RTTI asks whether the NAP provides road width, and Belgium answered Yes. mobilityDCAT-AP has an exact term for it, “road-width”, sitting below the superclass term “static road network data”. No dataset in the Belgian catalogue carries the term road-width, yet thirteen carry the parent. One of them is the National Geographic Institute’s Top10Vector, a national topographic dataset that the data provider confirmed contains road widths and says nothing finer than “static road network data”. The data is there. The metadata catalogue cannot say so.

The questionnaire asks:

```
RTTI, row 8
1. Data on infrastructure, road network links and their physical attributes
  (a) road network links and their physical attributes
    (ii) Road width cell J8 = "Yes"
```

The vocabulary has a term for it:

```
https://w3id.org/mobilitydcat-ap/mobility-theme/road-width
skos:prefLabel "Road width"
skos:broader .../mobility-theme/static-road-network-data
```

No dataset carries that term. One of the thirteen carrying the parent reads:

```
<dcat:Dataset rdf:about="https://transportdata.be/dataset/1207569b-...">
  <dct:title>Topographic vector data Belgium -Top10Vector</dct:title>
  <dct:publisher>NGI - IGN</dct:publisher>
  <mobilitydcatap:mobilityTheme
    rdf:resource=".../mobility-theme/static-road-network-data"/>
  <dcatap:applicableLegislation>MMTIS</dcatap:applicableLegislation>
</dcat:Dataset>
```

The legislation declared for a dataset is not what establishes the category. The match is made on the data content category, and the two are tagged independently. Top10Vector is declared under MMTIS, whose Annex also asks for the road network, while road width is asked for by RTTI. Of the thirteen Belgian datasets that carry the road network category, eight are declared under MMTIS and six under RTTI, one of them under both. An assessment keyed on the declared legislation rather than on the data content category would therefore miss most of them, which is the same effect seen for AFIR later in this section. Table 9 lists the thirteen datasets.

Table 9. The thirteen Belgian datasets carrying the static road network data category, and the legislation each declares

Dataset	Publisher	Declared under
Belgian road network - Top10Vector	NGI - IGN	MMTIS
Brussels Street Axes	Brussels Mobilité - Mobiliteit - Mobility	MMTIS
Brussels mobility data	Brussels Mobilité - Mobiliteit - Mobility	MMTIS
Geodata_stadantwerpen	Stad Antwerpen	MMTIS
TopoMapView	NGI - IGN	MMTIS
Topographic vector data Belgium - Top10Vector	NGI - IGN	MMTIS
Wegenregister	Agentschap Wegen en Verkeer	MMTIS

Dataset	Publisher	Declared under
Mobilidata	Agentschap Wegen en Verkeer	MMTIS, RTTI, SRTI, SSTP
Points marquants du réseau routier régional	Service public de Wallonie Mobilité et Infrastructures	RTTI
Réseau routier géré par la Région wallonne	Service public de Wallonie Mobilité et Infrastructures	RTTI
TomTom Map API	TomTom Global Content B.V.	RTTI
Traffic Events (Touring Mobilis)	Be-Mobile	RTTI
Ouvrages d'art de la Région wallonne	Service public de Wallonie Mobilité et Infrastructures	RTTI

The same holds for the five sibling categories, geometry, gradients, junctions, number of lanes and road classification, which together are most of what RTTI asks about the road network. All six sub-terms of static road network data are unused in the catalogue, as are all seven for static traffic signs and regulations, all nine for the dynamic ones and all four for tolling. The specification is not the constraint here. Tagging a dataset at the level of the category is enough for it to be found and reused. A part of the explanation lies in the update process of the metadata, as the creation and updating of the terms (controlled vocabularies) in mobilityDCAT-AP was done incrementally, and requires propagation on the NAPs. After making the new terms technically available on the NAP, further time is required to contact the data publisher to adapt and/or refine the terms used in the metadata.

The distribution across all five regulations is shown category by category in Figure 21, which lays out the 171 categories in the order of the assessment form.

Belgium — what the mobilityDCAT-AP catalogue can establish, category by category

All 171 leaf data categories of the Task 5.1 questionnaire. Catalogue: 192 datasets retrieved 31 July 2026 · vocabulary: Mobility Theme v1.1.1

Exact match with BE metadata dataset · 36 No BE metadata dataset uses it · 48 No match in vocabulary · 87

MMTIS — Multimodal Travel Information

58 leaf categories · 28 exact matches

✓28 · 111 · #19

- (i) Addresses (building number, street name, postcode)
- (ii) Topographic places (city, town, village, suburb, administrative unit)
- (iii) Points of interest (related to transport information) to which people may wish to...
- (b) Trip plans: operational calendar, mapping day types to calendar dates
- (i) Identified access nodes
- (ii) Geometry/map layout structure of access nodes
- (i) Connection where interchanges may be made
- (ii) Default transfer times at interchanges
- (iii) Network topology and routes/lines (topology)
- (iv) Transport operators
- (v) Timetables
- (vi) Planned interchanges between guaranteed scheduled services
- (vii) Hours of operation
- (viii) Facilities of access nodes (including platform information, help desk/informatio...
- (ix) Vehicles, including their accessibility (such as low floor, wheelchair accessible...
- (x) Accessibility of access nodes, and paths within an interchange (such as existence o...
- (xi) Existence of assistance services (such as existence of on-site assistance)
- (i) Road network (including segregated lanes for bus/taxi)
- (ii) Cycle network (cycle tracks, cycle lanes, bus-and-cycle lanes, on-road shared with...
- (iii) Pedestrian network and accessibility facilities
- (i) Location of parking places (on and off-street), including accessible parking places...
- (ii) Park & Ride stops
- (iii) Park & Drive stops
- (iv) Bike-sharing stations
- (v) Car-sharing stations
- (vi) Secure bike parking (such as locked bike garage)
- (vii) Scooter parking zones
- (i) Where and how to buy tickets for scheduled transport, including retail channels, fu...
- (ii) Where and how to pay for parking, including retail channels, fulfilment methods, p...
- (i) Basic common standard fares: fare network data (fare zones/stops and fare stages) /...
- (ii) Vehicle facilities, including classes of carriage, on-board Wi-Fi, capacity and ac...
- (i) Passenger classes (classes of passenger such as adult, child, senior, student, mil...
- (ii) Common fare products (access rights such as zone/point-to-point including daily an...
- (iii) Special fare products (offers with additional special conditions such as promotio...
- (iv) Basic commercial conditions such as refunding, replacing, exchanging or transferring
- (v) Basic booking conditions such as purchase windows validity periods, routing restr...
- (b) Information service – for transport on demand: how to book demand-responsive transp...
- (i) Detailed cycle network attributes (surface quality, side-by-side cycling, shared su...
- (ii) Parameters needed to calculate an environmental factor such as greenhouse gas emis...
- (iii) Parameters needed to calculate an environmental factor such as greenhouse gas emi...
- (i) Trip plan computation: estimated travel times by day type and time-band by transpor...
- (a) Historic travel and traffic data on delays – for scheduled transport and transport ...
- (i) Length of, and when possible the reason for, delays of at least 60 minutes for rail...
- (ii) Length of, and when possible the reason for, delays in departure of more than 90 m...
- (iii) Length of, and when possible the reason for, delays in departure from a terminal ...
- (iv) Length of, and when possible the reason for, flight delays at departure of at leas...
- (i) Cancellations, and when possible the reason, of rail passenger services
- (ii) Cancellations, and when possible the reason, of sea and inland waterways passenger...
- (iii) Cancellations, and when possible the reason, of regular bus and coach services wi...
- (iv) Cancellations, and when possible the reason, of flights
- (d) Information on parking tariffs
- (i) Disruptions, such as network closures and/or diversions, and when possible, the rea...
- (ii) Real-time status information such as estimated departure and arrival times of ser...
- (iii) Status of access node features (including dynamic platform information, operation...
- (a) Information service on parking tariffs – for transport on demand and personal trans...
- (i) Car-sharing availability and location, bike-sharing availability and location, scoo...
- (ii) Car parking spaces available (on and off-street)
- (d) Occupancy information of the vehicle – for scheduled transport and transport on demand ...

SSTP — Safe and Secure Truck Parking

14 leaf categories · 0 exact matches

11 · #13

- (a) Identification information of parking area (name and address of the truck parking a...
- (b) Location information of the entry point in the parking area (latitude/longitude)
- (c) Primary road identifier1/direction, and primary road identifier2/direction if same...
- (d) If needed, the indication of the Exit to be taken / Distance from primary road (km) ...
- (e) Total number of free parking places for trucks
- (f) Price and currency of parking places
- (a) Description of security, safety and service equipment of the parking including nati...
- (b) Number of parking places for refrigerated goods vehicles
- (c) Information on specific equipment or services for specific goods vehicles and other
- (a) Name and surname of the parking operator
- (b) Telephone number of the parking operator
- (c) E-mail address of the parking operator
- (d) Consent of the operator to make his contact information public (Yes/No)
- (a) Data on whether a parking is: full, closed or number of free places which are avail...

SRTI — Safety-related Traffic Information

8 leaf categories · 1 exact match

✓1 · 11 · #6

- (a) Temporary slippery road
- (b) Animal, people, obstacles, debris on the road
- (c) Unprotected accident area
- (d) Short-term road works
- (e) Reduced visibility
- (f) Wrong-way driver
- (g) Unmanaged blockage of a road
- (h) Exceptional weather conditions

RTTI — Real-Time Traffic Information

47 leaf categories · 6 exact matches

✓6 · 135 · #6

- (i) Geometry
- (ii) Road width
- (iii) Number of lanes
- (iv) Gradients
- (v) Junctions
- (b) Road classification
- (c) Location of tolling stations
- (d) Location of service areas and rest areas
- (e) Location of recharging points for electric vehicles and the conditions for their use
- (f) Location of compressed natural gas, liquefied natural gas, liquefied petroleum gas ...
- (g) Location of refuelling points and stations for all other fuel types
- (h) Location of delivery areas
- (i) Access conditions for tunnels
- (ii) Access conditions for bridges
- (iii) Permanent access restrictions
- (iv) Speed limits
- (v) Freight delivery regulations
- (vi) Overtaking bans on heavy goods vehicles
- (vii) Weight/length/width/height restrictions
- (viii) One-way streets
- (ix) Boundaries of restrictions, prohibitions or obligations with zonal validity, cure...
- (x) Direction of travel on reversible lanes
- (b) Traffic circulation plans
- (i) Access conditions for tunnels
- (ii) Access conditions for bridges
- (iii) Permanent access restrictions
- (iv) Other traffic signs reflecting traffic regulations
- (a) Static and dynamic traffic regulations, other than the regulations referred to in 2...
- (c) Identification of tolled roads, applicable fixed road user charges and available pa...
- (d) Variable road user charges and available payment methods
- (a) Road closures
- (b) Lane closures
- (c) Roadworks
- (d) Temporary traffic management measures
- (a) Bridge closures
- (b) Accidents and incidents
- (c) Poor road conditions
- (d) Weather conditions affecting road surface and visibility
- (e) Traffic volume
- (f) Traffic speed
- (g) Location and length of traffic queues
- (h) Travel times
- (i) Waiting time at border crossings
- (j) Availability of delivery areas
- (k) Availability of recharging points for electric vehicles
- (l) Availability of refuelling points and stations for alternative fuel types
- (i) Price of ad hoc recharging/refuelling

AFIR — Alternative Fuels Infrastructure

44 leaf categories · 1 exact match

✓1 · #43

- (i) Legal name of the recharging or refuelling point operator or owner
- (ii) Commercial name of the recharging or refuelling point operator or owner
- (iii) Number of recharging or refuelling points
- (iv) Service support
- (v) Helpdesk telephone
- (vi) Facilities offering associated services to the user
- (vii) Global navigation satellite system (GNSS) geographic location information
- (viii) Additional geographic location information
- (ix) Country
- (x) Region
- (xi) City or town
- (xii) Postal code
- (xiii) Address name
- (xiv) Opening time
- (xv) Time zone
- (xvi) Vehicle-type compatibility
- (xvii) Vehicle specifications permitted
- (xviii) Number of parking spaces
- (xix) Number of parking spaces for people with disabilities
- (xx) Payment device with bank card reader
- (xvi) Payment device with a contactless functionality that is at least able to read pay...
- (xii) Other ad hoc payment option
- (xiii) Additional information about payment providers accepted
- (xiv) Contract-based (subscription) payment option
- (i) Recharging point ID code (connector)
- (ii) Number of connectors
- (iii) Type of connector (plug)
- (iv) Type of current
- (v) Recharging station maximum power
- (vi) Recharging point maximum power
- (vii) Mobility service providers offering contract-based recharging
- (viii) Plug-and-charge
- (ix) Smart recharging services
- (x) Electricity supplied is 100 % renewable
- (i) Hydrogen state
- (ii) Hydrogen pressure
- (iii) Daily cumulative capacity
- (iv) Hydrogen supplied is 100 % renewable
- (i) Liquefied methane supplied is 100 % renewable
- (i) Type of connector (dispenser)
- (i) Operational status
- (i) Availability
- (ii) Ad hoc price
- (i) Limited amount of hydrogen available

Green is an exact match with a BE metadata dataset — what an automated inventory answers today (36 of 171, 21%).

Amber needs no change to the specification, only that a BE metadata dataset uses a term the vocabulary already provides. Red is where the vocabulary has no match, describing the data at its own granularity — not in itself a deficit

Figure 21. Belgium: what the mobilityDCAT-AP catalogue can establish for each data category, by Delegated Regulation



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Figure 21 shows the two shortfalls as blocks of colour. RTTI is almost entirely orange. That is a gap in tagging practice, and guidance and validation at submission would close it, without touching the specification.

AFIR is almost entirely red. There, 43 of its 44 categories have no match in the vocabulary and 35 have no related term at all, so no amount of care in tagging would help, and only an extension of the vocabulary will, which the mobilityDCAT-AP work already has in hand. A category that the vocabulary does not carry is not a critical error of either the vocabulary or the catalogue, since the catalogue organises data with the purpose of discovery and reuse rather than to mirror the categories present in the annexes of the Delegated Regulations. Across all five regulations, 48 of the 135 categories that cannot currently be answered at their own granularity need no change to the specification at all.

The assessment can be repeated at any time rather than read once. The code developed for the purpose takes a metadata catalogue, by URL or as files, follows the paging where present, and writes the result into a copy of the Task 5.1 form. An exact match becomes Yes, a match the metadata catalogue does not use becomes No, and a category with no match is left blank. For Belgium the automated form holds 36 Yes and 48 No against the operator's 145 Yes and 26 No. The two agree on 42 categories and never contradict one another in the opposite direction, so there is no category the catalogue claims and the operator denies. This observation is a further argument that NAP operators, with their detailed knowledge of the published datasets' contents, can provide more detailed and more up-to-date information than what is provided by data publishers in the metadata. This further advocates to a survey that can indeed be prepared through automation (based on mobilityDCAT-AP), but that requires validation by a NAP representative before final submission.

The metadata catalogue can also audit the answers rather than only reproduce them. Belgium answered Yes to whether its metadata is complete and consistently applied. Every dataset does carry a title, a description, a publisher, a contact point, spatial and temporal coverage, an update frequency, a modification date, a data content category and at least one distribution. Against that, the format element is absent from all 218 distributions, the licence element from 88 of them, and a quarter of the datasets are tagged only as "other".

One apparent contradiction deserves care. No dataset in the metadata catalogue is marked as falling under AFIR, although the questionnaire reports 34 of the 44 AFIR categories as available. This is not evidence that the data is missing, since 14 datasets carry charging or filling station categories and are tagged as MMTIS or RTTI instead. The discrepancy is one of classification rather than of availability, but only a machine-readable catalogue makes it visible, and an assessment keyed on the applicable legislation alone would report Belgian AFIR coverage as zero.

The tagging shows the same pattern as the road network. All fourteen datasets that carry a charging or filling station category are declared under MMTIS or RTTI, nine and five respectively, and none under AFIR. Two of them name AFIR in their own titles, one citing Article 20 of the regulation directly. The declared legislation is not what the assessment matches on here either, and an assessment that used it would report Belgian AFIR coverage as zero while the datasets sit in the metadata catalogue under another heading. Once again this can be explained by the recent inclusion of AFIR in the controlled vocabularies of mobilityDCAT-AP being finalised¹. Table 10 lists the fourteen datasets.

¹ The NAP representatives of Belgium confirmed that this is further due to that fact that while the Belgian NAP transportdata.be currently allows for the registration of AFIR-related datasets, an official enlargement of the scope of the NAP for the AFIR DR is pending. Once officially launched, the datasets will be tagged with "AFIR".



Table 10. The fourteen Belgian datasets carrying a charging or filling station category, and the legislation each declares

Dataset	Publisher	Declared under	Category carried
Brussels mobility data	Brussels Mobilité - Mobiliteit - Mobility	MMTIS	Filling and charging stations
CNG/LNG stations	Gas.be	MMTIS	Filling and charging stations
Data Stad Gent	Stad Gent	MMTIS	Filling and charging stations
EVCI - Electric Vehicle Charging Infrastructure	Gireve	MMTIS	Filling and charging stations
Geodata_stadantwerpen	Stad Antwerpen	MMTIS	Filling and charging stations
Hydrogen Refueling Stations	h2mobility	MMTIS	Filling and charging stations
Hydrogen Refuelling Stations	Clean Hydrogen Joint Undertaking	MMTIS	Filling and charging stations
Overzicht laadpunten	Eco-Movement	MMTIS	Filling and charging stations
indigo-open-data-evcharging	Group INDIGO	MMTIS	Filling and charging stations; location and conditions of charging points
EnergyVision Public Charging Network (AFIR / OCPI 2.2.1)	EnergyVision	RTTI	Availability of charging points; filling and charging stations; location and conditions of charging points
Public charging infrastructure static dataset selected CPOs, as required by Article 20 of the AFIR regulation.	Eco-Movement	RTTI	Filling and charging stations; location and conditions of charging points
Public_charging_infrastructure_monta	Monta	RTTI	Availability of charging points; filling and charging stations; location and conditions of charging points
Road Public Charging Network	Road	RTTI	Availability of charging points; filling and charging stations; location and conditions of charging points
Tesla-API	Tesla Belgium BV	RTTI	Availability of charging points; filling and charging stations; location and conditions of charging points

The metadata catalogue also answers questions the questionnaire never asks, simplified as it is. It states which exchange standards are in use, with DATEX II on 25 distributions, GBFS on 14, NeTEx on 7 and GTFS on 6. It names the 73 publishers, shows how the data is reached, and records how often it changes, from 20 datasets updated every minute to 102 declared irregular. Obtaining all of it costs one request and a parsing script, demonstrating the utility of mobilityDCAT-AP as an endpoint.

5.4. Findings and conclusion

For the Belgian case the metadata catalogue in mobilityDCAT-AP format replaces the metadata part of the questionnaire outright and about a fifth of the data availability part. It also adds evidence on publishers, standards, protocols, update frequencies and coverage that the questionnaire does not collect. The remaining gap is not a permanent property of the method. It has two causes and both are



closing. Today 51 % of the categories have no match in the vocabulary, which successive releases of mobilityDCAT-AP are expected to reduce. A further 28 % have a match that no dataset uses. As catalogues become more completely attributed and the controlled vocabularies more complete, a fully automated assessment of data availability comes within reach. What will stay outside it is not availability at all. Governance, funding, helpdesk provision and operator intent are organisational questions that no metadata catalogue sets out to describe, and they will continue to need a survey or an interview.

The metadata catalogue should be the primary source for everything it can evidence, because it is verifiable, timestamped and repeatable at negligible cost, and the questionnaire should be reduced to what the metadata catalogue cannot (yet) answer, then reduced again at each release of the vocabulary. On the evidence of this case that already removes the whole metadata section and about a fifth of the data availability grid from the form NAP operators are asked to complete, and it replaces self-assessment with measurement wherever a NAP publishes a conformant catalogue. The direction of progress is towards a form that asks only what a metadata catalogue cannot.

6. Best features of NAPs

In this section some remarks on NAPs and their current practices are reported. These connect to the overall operational models, metadata practices, details about the data itself, development plans and features that respondents identified as working well.

6.1. Austria

Austria's NAP (<https://www.mobilitydata.gv.at/en/>), a metadata directory, is being redeveloped into a new platform that is being benchmarked against NAPCORE's KPI framework and national expectations.

The success of the Austrian NAP can be connected to the close relationship between NAP operator and the Competent Authority/National Body. It was also reported that the short response time to data providers/holders is one key factor in the improvement of overall operations and quality of the catalogue.

When asked to leave a more general comment or note, the respondent deemed the registration of data providers in the platform of high importance.

Aside from full adoption of mobilityDCAT-AP, publicly accessible metadata catalogue, with metadata export functionality and API-based access to metadata, the Austrian NAP is based on strong institutional cooperation and responsive user support.

A direct review of the NAPs shows a live usage dashboard reporting 106 datasets, 32 data providers and over 11 million cumulative search requests, alongside a curated "quick search" panel (road network, freight and tolling, traffic restrictions, traffic data, parking and charging) that exposes the catalogue by topic alongside the free-text search, evidence of both sustained use and a discoverability feature aimed at first-time visitors.

Austria directly provides a direct email contact in their platform to the Competent Authority/National Body (accompanied by the responsibilities and role they encompass) facilitating direct communication and supporting data/service providers further.

6.2. Belgium

The Belgian NAP (<https://transportdata.be/en/>) is mainly a metadata directory, generally not hosting the data itself. This implies that data re-users must access the data via the data provider. However, the



NAP offers data storage functionalities for smaller companies (e.g. one-man taxi firms or independent fuel providers) that do not have the technical means to store data online on their own. As such, the NAP can be considered a 'hybrid' platform. Development though remains focused on the metadata directory functionalities.

As discussed in the report, the controlled vocabularies of mobilityDCAT-AP are not yet adapted for AFIR, therefore there will be an effort to integrate the additions being finalised within Task 4.4 Metadata specification.

The mobilityDCAT-AP 1.1.0 specification structures properties into three tiers: mandatory (required for basic compliance), recommended (strongly encouraged for production use), and optional (specialised use cases). Table 11 shows the compliance of the BE NAP with the different properties for the different classes (catalogue, dataset and distribution level), adopted from [12].

Table 11. Overview of mobilityDCAT-AP compliance by property

Catalogue	Class	Mandatory (%)	Recommended (%)	Optional (%)
BE	Catalogue	100.0	100.0	25.0
	Dataset	100.0	44.4	26.7
	Distribution	100.0	33.3	0.0

Noteworthy that respondent highlighted the importance for the NAP to using EU-wide controlled vocabularies rather than national variants, which denotes attention to the inherent interoperability advantages.

A direct review of Belgium platform confirms this guidance-first approach in practice, transportdata.be runs on the open-source CKAN platform with a publicly documented API and source code and pairs the catalogue with a tutorial video and separate onboarding pages for data providers and data re-users, rather than leaving either group to work out the submission process unassisted.

6.3. Cyprus

Cyprus has not yet implemented the mobilityDCAT-AP schema in full, currently using only its catalogue-level elements, but has scheduled full adoption as part of the TISGRADE project. This roadmap, together with the NAP's comparatively recent deployment, explains why SRTI coverage is still being completed rather than absent by policy choice.

A direct review of the platform (<https://www.traffic4cyprus.org.cy/>), shows the interactive map is one of several linked services rather than a standalone feature: CyNAP also connects to TN-ITS Cyprus, for exchanging changes to static road attributes, and to the GNOSIS and FixCyprus platforms, extending the NAP's role beyond a self-contained catalogue.

6.4. Czechia

The Czech NAP (<https://registr.dopravniinfo.cz/en/>) emphasizes dataset quality and usability by requiring comprehensive dataset documentation, schemas, and examples. This significantly improves the ability of users and developers to understand and reuse published data.

Its main strengths include:

- Mandatory provision of schemas and examples.
- Detailed documentation for every dataset.
- Bilingual metadata and descriptions (Czech and English).



- Strong focus on data usability and accessibility.

Although Czechia currently uses a national metadata model derived from the EU EIP SA46 Coordinated Metadata Catalogue (CMC), plans for the new NAP (realisation in 2027-2028) indicate continued modernisation efforts.

A direct review confirms the metadata directory type, which operates as a subscription broker: the site itself states that it holds only metadata, and that data must be reached by subscribing to each provider's own distribution interface, with the registry limited to sources, providers and subscription instructions.

6.5. France

A direct review of [Transport.data.gouv.fr](https://transport.data.gouv.fr/?locale=en) (<https://transport.data.gouv.fr/?locale=en>) highlights uncommon developer-facing characteristics: together with the catalogue it offers a public GTFS/data quality validator, a GTFS comparison tool, a SIRI query generator, an accessibility-data tool, a public statistics page and a service-status page, and an openly published codebase.

Reported coverage stood at 352 of 1,156 territories, 76% of the population, for scheduled public transit.

Bison Futé (<https://www.bison-fute.gouv.fr/>), by contrast, is primarily a public-facing traveller-information site, real-time conditions, journey forecasts, its long-running “Bison Futé calendar” of peak travel days, with a comparatively small “data access” section for subscriptions.

Platforms can be therefore considered different in focus, not just in metadata practice.

6.6. Latvia

Latvia's platform (<https://www.transportdata.gov.lv/en>) serves as NAP for both real-time traffic and multimodal travel information and separately operates an ID Registration Organisation (IDRO) service that issues unique identifiers, in the format LV-xxx, to charging-point operators and mobility service providers under AFIR. It also publishes EU external border-crossing waiting-time data using the DATEX II v3 standard, a category few other assessed NAPs report.

Several particularly noteworthy features distinguish the Latvian approach:

Multiple data exchange mechanisms, allowing users to access data either through REST services for file-based exchanges or through MQTT for real-time data streaming and continuous data flows.

- Comprehensive traffic information visualisation, with a dedicated traffic map displaying almost all events occurring on the national road network, significantly improving the usability and accessibility of real-time traffic information.
- Secure and automated access management, using automatically generated API keys to facilitate controlled and secure data exchange.
- Pre-publication data validation services, enabling data publishers to validate their data services before publication, thereby improving overall data quality and reducing errors.
- Built-in reporting and analytics tools, providing:
 - Download statistics for data consumers.
 - Usage and download reports for data publishers, enabling them to monitor the uptake and impact of their datasets.

Latvia's NAP records full marks across all five scored metadata questions: metadata is available, complete and consistently applied across all datasets, mobilityDCAT-AP adoption and catalogue is both publicly accessible and exportable.

6.7. Norway

Norway's NAP, a metadata directory reached at transportportal.no, is published as a filtered subset of Norway's general national open-data catalogue <https://data.norge.no/nb>, rather than as a standalone transport portal.

Data providers/holders describe their dataset once, in the general catalogue, and that same description serves both the general portal and the NAP; work undertaken to support additional metadata standards on the NAP, mobilityDCAT-AP, also benefits the general catalogue's support for the High-Value Datasets profile, HVD-DCAT-AP.

A direct review confirms the catalogue is searchable in both Norwegian and English, and its documentation states a preference for free, low-friction reuse: licence terms, where used, are expected to impose “as few restrictions on reuse as possible”.

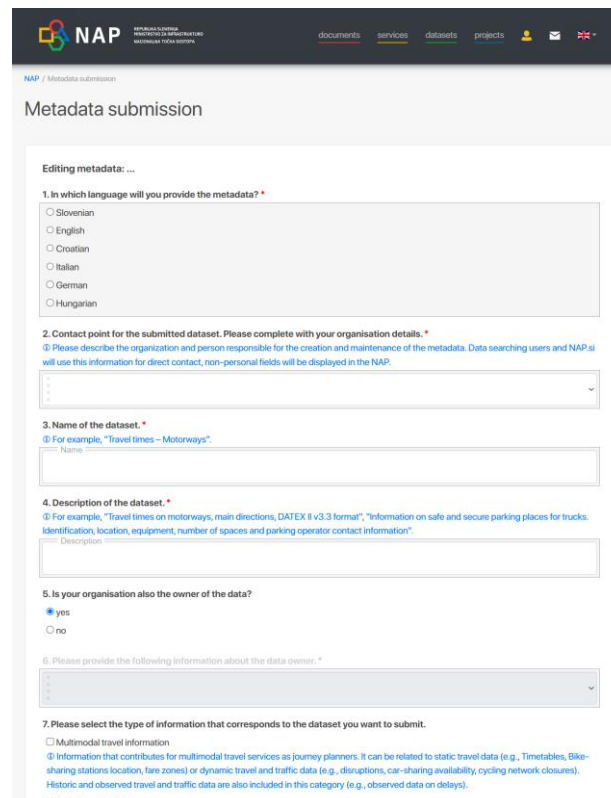
The underlying data catalogue's profile is itself a national extension, DCAT-AP-NO, compatible with the EU-wide DCAT-AP referenced in this report.

6.8. Slovenia

The Slovenian NAP (<https://nap.si/en>) combines characteristics of a data platform with close operational links to the National Traffic Management Centre. This integration enables direct collaboration with data providers and facilitates the publication of traffic, mobility, and infrastructure data.

Noteworthy features include:

- Close cooperation with data providers/holders.
- Links to SiMO.si for multimodal route planning and PROMET.SI for real-time traffic conditions easily accessible from the NAP.
- Digital workflows for metadata submission, aligned with mobilityDCAT-AP, part of this process is the metadata submission form that facilitates the completion of information about the dataset guiding the data provider/user (Figure 22).



The screenshot shows the 'Metadata submission' form on the NAP portal. The form is titled 'Editing metadata: ...' and contains several sections:

- 1. In which language will you provide the metadata? ***: A radio button selection for Slovenian, English, Croatian, Italian, German, and Hungarian.
- 2. Contact point for the submitted dataset. Please complete with your organisation details. ***: A text input field with a note: 'Please describe the organization and person responsible for the creation and maintenance of the metadata. Data searching users and NAP.si will use this information for direct contact, non-personal fields will be displayed in the NAP.'
- 3. Name of the dataset. ***: A text input field with a note: 'For example, "Travel times - Motorways".'
- 4. Description of the dataset. ***: A text input field with a note: 'For example, "Travel times on motorways, main directions, DATEX II v3.3 format", "Information on safe and secure parking places for trucks. Identification, location, equipment, number of spaces and parking operator contact information".'
- 5. Is your organisation also the owner of the data?**: Radio buttons for 'yes' (selected) and 'no'.
- 6. Please provide the following information about the data owner. ***: A text input field.
- 7. Please select the type of information that corresponds to the dataset you want to submit.**: Radio buttons for 'Multimodal travel information' (selected), 'Information that contributes for multimodal travel services as journey planners. It can be related to static travel data (e.g., Timetables, Bike-sharing stations location, fare zones) or dynamic travel and traffic data (e.g., disruptions, car-sharing availability, cycling network closures). Historic and observed travel and traffic data are also included in this category (e.g., observed data on delays).', and 'Real-Time Traffic information'.

Figure 22. Metadata submission form

NAP developments are now being focused on the full adoption of mobilityDCAT-AP, in particular on the exportation of the catalogue from the portal and on the related API.

6.9. Spain

Spain reports through two NAPs, nap.dgt.es (<https://nap.dgt.es/>) and nap.transportes.gob.es (<https://nap.transportes.gob.es/>), jointly assessed in this report as Spain NAP. A direct review of both platforms in August 2026 adds two points. [Nap.dgt.es](https://nap.dgt.es/), built on CKAN, aggregates 38 datasets from ten organisations spanning national (DGT), regional (Servicio Catalán de Tráfico, Dirección de Tráfico del Gobierno Vasco), municipal (Ayuntamiento de Madrid, Diputación de Valencia) and private (HERE, TomTom) data holders under a single catalogue, a working example of the stakeholder-integration challenge discussed being managed. [Nap.transportes.gob.es](https://nap.transportes.gob.es/) reports coverage of all 52 provinces and autonomous cities, 94.93% of the population, for scheduled transport.

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6.10. Sweden

The Swedish NAP (<https://trafficdata.se/>) benefits from the comprehensive coverage and maintenance of data within the National Road Database (NVDB), which serves as a highly reliable source of road-related information.



Sweden's NAP (trafficdata.se), a metadata directory, builds its road-network coverage on NVDB, the National Road Database, which is an example of a NAP inheriting completeness and quality from an authoritative national register rather than having to establish it independently.

Trafficdata.se pairs its catalogue with dedicated, bilingual (Swedish/English) user manuals covering both how to publish and how to access data, another good example of user guidelines that contributes to the NAPs good operation.

6.11. Denmark

A last-minute addition to the deliverable refers to the Danish NAP, accessible from: <https://du-portal-ui.dataudveksler.app.vd.dk/>.

The Danish NAP provides a noteworthy example of how metadata governance can be part of the data publication process, the assignment of both a data owner and a data manager for each dataset, establishing clear responsibilities for metadata maintenance and accountability.

Furthermore, the platform includes an automated metadata quality assurance process, whereby data managers receive periodic email reminders (currently after 150 days) requesting them to review and update metadata descriptions. Such automated governance mechanisms help maintain metadata quality over time and reduce the risk of outdated catalogue information.

The Danish NAP also highlights the importance of user-friendly metadata registration tools, facilitating metadata creation and reducing the administrative burden for data publishers.

7. Actionable recommendations for Member States

Task 5.1 focuses generally on supporting Member States. Therefore, in this section we collected actionable recommendations that can be considered priority for improving data and metadata availability.

Even though targeted mainly to NAP operators, within Task 8.2 – NAP Support Center, a workshop on NAP Operations (February 2026), additionally prompted the inclusion of this section in D5.1.1. The workshop objective was to identify and prioritise the most urgent topics requiring support. The highest-ranked priorities are closely related to improving data and metadata availability. Figure 23 summarises the topics with most votes. The number next to each box indicates the topics with most votes.

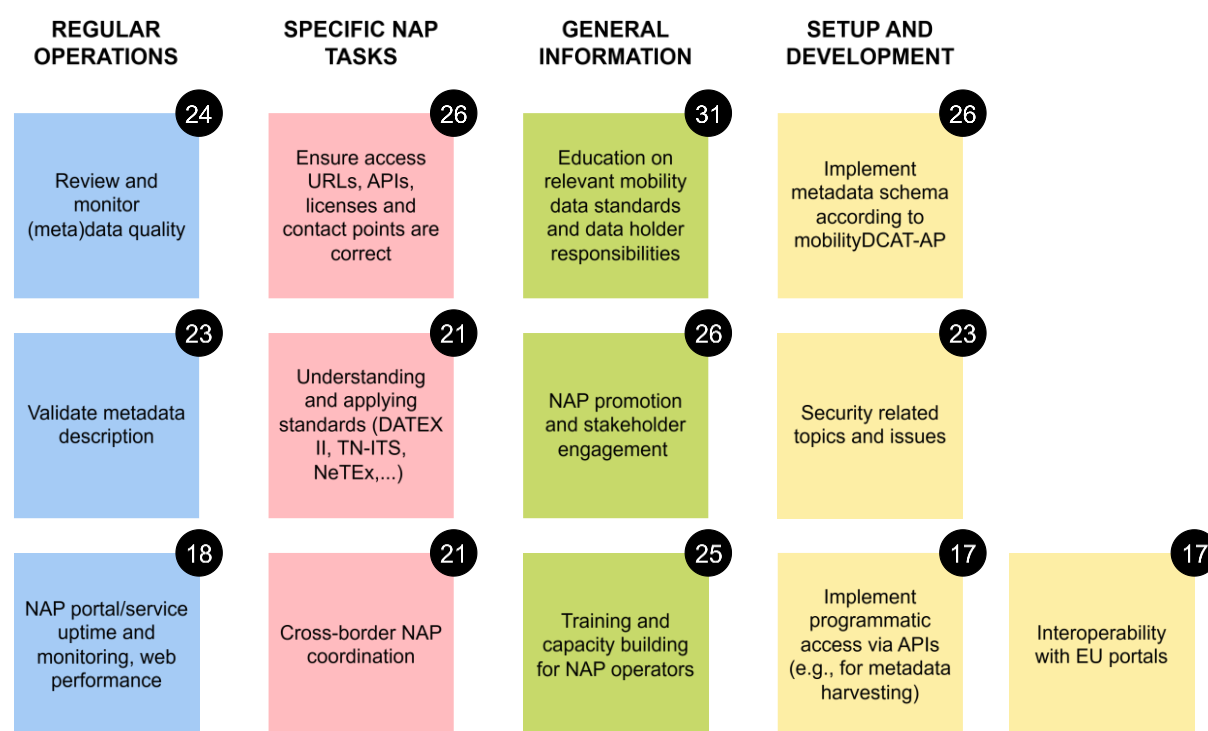


Figure 23: Prioritisation of topics concerning NAP operations.

Although these topics mostly reflect operational needs, they are revealing of systemic structural gaps where direct support from Member States intervention is needed and can influence positively through governance and policy, funding, legislation, procurement, or coordination. Combined with previous findings in this report, the following actions are proposed:

Governance and policy

- National transposition of Directive (EU) 2023/2661 of the European Parliament and of the Council of 22 November 2023 amending Directive 2010/40/EU on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport.
- Publish national guidance clarifying reporting obligations, technical requirements and implementation practices, reducing ambiguity and repeated clarification requests. This may be structured in national regulations connected to the transposition of the ITS Directive.
- Plan the long-term evolution of the NAP as a strategic component of national digital infrastructure, sequencing requirements in line with infrastructure, operational and technological developments.
- Establish and empower Competent Authorities/National Bodies to efficiently carry out the compliance assessment process, and consider assigning extended responsibilities as needed, e.g., dispute resolution between data providers/holders and data re-users.
- Ensure public authorities and regulated data holders outside the traditional road-authority responsibility, e.g., municipalities, parking and tolling concessionaires, demand-responsive transport and charge-point operators, actively publish and maintain data through the NAP.

Resources and capacity building

- Lead national communication and stakeholder engagement to raise awareness and secure participation across the wider data-holder ecosystem.
- Build national capacity through regular training for NAP operators and data providers/holders.
- Ensure stable funding and staffing for NAP operations, monitoring and maintenance.

Standards, quality and interoperability

- Ensure the application of the requirements set out in the Delegated Regulations (note that the Delegated Regulations connected to the ITS Directive do not require national transposition and apply directly)
- Support cross-border coordination through Ministry-level participation in initiatives such as NAPCORE.
- Mandate open, standard licensing terms that impose as few restrictions on reuse as possible, consistent with the Open Data Directive (EU) 2019/1024 [13] and the access-and-reuse conditions already set out in the Delegated Regulations.

Actionable recommendations directly connected to the improvement of data availability:

- Guarantee provision of the data covered by the ITS Directive and Delegated Regulations, ensuring that the data providers/holders are identified and made aware of their responsibilities.
- Require the implementation of harmonised technical standards aligned with those recommended in the Delegated Regulations, e.g., NeTeX, SIRI, TN-ITS, DATEX II, all are explicitly mentioned in the Delegated Regulations due to their suitability and quality.
- Monitor national data coverage to identify gaps in data availability and prioritise corrective actions where required datasets are missing or incomplete.
- Fund and support NAP automation, validation services, APIs and assessment tools that reduce the workload of data providers/holders and improve data quality and availability on the NAPs.
- Ensure participation of all relevant data providers/holders, including, e.g., municipalities, parking operators, tolling concessionaires, charge-point operators, shared mobility providers, and demand-responsive transport operators.
- Provide targeted support to smaller organisations that may lack the technical or organisational capacity to comply with data-sharing obligations.
- Encourage publication beyond minimum regulatory requirements, promoting datasets that provide additional value for transport services and users.
- Promote machine-readable and API-based access to datasets to improve usability and reuse.
- Ensure continuity and maintenance of published datasets, including regular updates and operational monitoring.
- Support investment in the real-time monitoring and sensing infrastructure required in order to generate operational data at the source.
- Regarding categories which are commercially sensitive (for example, tolling, variable road user charges and subscription-based recharging), specific guidance should be published, setting out what has to be included in the Delegated Regulations and explaining how it is possible to protect legitimate commercial interests within that obligation.

Actionable recommendations directly connected to the improvement of metadata availability:

- Require mobilityDCAT-AP for metadata, it is the undisputable best choice for NAPs focused on the transportation/mobility domain.
- Establish metadata quality monitoring and validation processes to improve completeness, consistency, and accuracy.
- Ensure metadata are publicly accessible and machine-readable, including support for metadata APIs and harvesting services.
- Require complete metadata descriptions, including, e.g., access URLs, contact points, licences, geographical coverage, and update frequencies.

- Promote the adoption of harmonised controlled vocabularies and reference data to improve interoperability across Member States.
- Support automated metadata harvesting and reporting mechanisms to reduce reporting burdens and improve consistency.
- Provide guidance and training on metadata creation and maintenance for data providers/holders and NAP operators.

8. Conclusions

This section brings together the key findings and recommendations set out in the preceding sections. Section 8.1 summarises the key findings of the assessment, together with the limitations that should be kept in mind when interpreting them. Section 8.2 outlines the next steps planned to extend and consolidate this work.

Across all surveyed NAPs, several recurring success factors emerged:

- Strong cooperation with national authorities and data providers.
- Comprehensive documentation, schemas, and examples for datasets.
- Integration with national open-data infrastructures to reduce duplication of effort.
- User-friendly discovery tools, such as interactive maps and search functionalities.
- Adoption of mobilityDCAT-AP.
- Digital metadata submission workflows that simplify participation by data providers.
- Provision of metadata APIs to support automated access and interoperability.
- Public metadata catalogues that improve dataset discoverability.
- Support mechanisms for smaller organisations that may lack technical capabilities.
- Continuous improvement programmes and future-proofing efforts.

8.1. Summary of key findings

The present assessment evaluates only the availability of datasets associated with the categories defined in the regulations connected to the ITS Directive. Since compliance with additional requirements concerning standards, metadata, accessibility, geographical coverage, interoperability and data quality was not assessed, the results should not be interpreted as compliance levels. Inclusion of these requirements would inevitably reduce, or at best maintain, the number of categories considered fully compliant. Therefore, we can regard the results as an upper-bound estimate.

The least-available categories across all five regulations point to challenges related to stakeholder integration, governance fragmentation, operational information, commercial and pricing information, digitalisation maturity, derived information, service maturity, infrastructure maturity, none mapped into the low-implementation-effort zone.

Availability of metadata alone does not always imply that the underlying data itself is described in sufficient detail. Some records point only to a URL and general description rather than to a fully specified distribution. Metadata information should be prioritised, as well as its correctness and completeness.

Every NAP in the sample publishes metadata and completeness is 82% on average, but on average only 41% make it retrievable. This should be prioritised.

Although the automated inventory based on metadata did not retrieve ideal results, it remains the most suitable basis for a complete assessment for several reasons:



- It enables verifiable, on-demand repeatable availability assessments.
- Promotes transparency and comparability amongst NAPs.
- Scalable for assessing NAPs with a large number of datasets.
- It expands beyond “simple” availability, allowing the retrieval of all the other elements that can be used as base for a first level compliance assessment (e.g., which standards are being used, what is the coverage of the data, how often is it being updated, which transport modes it refers to).
- Automated inventories can facilitate audits, needed to identify gaps and prioritise future developments.
- The quality of the assessment is expected to improve significantly with the upcoming release of mobilityDCAT-AP v3.0.0. For example, the extension of controlled vocabularies will enhance the qualitative aspects of the assessment.

National authorities play a central role in enabling and ensuring that NAPs excel in the fulfilment of their role to improve mobility data discoverability, accessibility, and reusability, supporting both national and cross-border ITS services.

8.2. Next steps

This report establishes a useful overview of the panorama of NAPs (through the selected sample) that draws attention to future challenges connected to the main objective of Task 5.1.

The more detailed study on metadata practices is specifically valuable as metadata can be seen as a major enabler for automated and accurate reporting practices. This relates directly to the next deliverable D5.1.2 Metadata-assisted reporting guidelines, where the main objectives are listed as follows:

- Support Member States with reporting obligations
- Establish a metadata-driven foundation to support DG MOVE reporting
- Define the processes required for the development of the ITS reporting tool

Early findings confirm that the automated assessment of data availability on NAPs can be significantly facilitated with standardised and machine-readable metadata. At the same time, the analysis highlights the importance of improving metadata completeness, consistency, and accessibility across NAPs to enable reliable reporting workflows and support future automation efforts, key for streamlining automated reporting.

9. References

- [1] Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02010L0040-20231220>.
- [2] Commission Delegated Regulation (EU) 2017/1926 amended by Delegated Regulation 2024/490 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of EU-wide multimodal travel information services, available at http://data.europa.eu/eli/reg_del/2024/490/oj.
- [3] Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act), available at <http://data.europa.eu/eli/reg/2023/2854/oj>.
- [4] ITS Directive and Action Plan, European Commission, available at https://transport.ec.europa.eu/transport-themes/smart-mobility/road/its-directive-and-action-plan_en.
- [5] Commission Delegated Regulation (EU) No 885/2013 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of information services for safe and secure parking places for trucks and commercial vehicles, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013R0885>.
- [6] Commission Delegated Regulation (EU) No 886/2013 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013R0886>.
- [7] Commission Delegated Regulation (EU) 2022/670 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of EU-wide real-time traffic information services, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R0670>.
- [8] Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure, available at <https://eur-lex.europa.eu/eli/reg/2023/1804/oj>.
- [9] W3C. (2024). Data Catalog Vocabulary (DCAT) – Version 3. W3C Recommendation, available from: <https://www.w3.org/TR/vocab-dcat-3/>.
- [10]. Interoperable Europe – SEMIC Support Centre. (n.d.). Application Profiles: What are they and how to model and reuse them properly? A look through DCAT-AP, available at <https://interoperable-europe.ec.europa.eu/collection/semic-support-centre/application-profiles-what-are-they-and-how-model-and-reuse-them-properly-look-through-dcat-ap>.
- [11]. European Commission, data.europa.eu. Open Data Maturity Report 2025, available at <https://data.europa.eu/en/open-data-maturity/2025>
- [12] Vandekeybus, N., Beernaerts, J., Dierick, M., & Hoang, T. K. M. (2026). mobilityDCAT-AP in practice: Compliance analysis of European NAPs and the Belgian reference implementation [Conference paper]. European ITS Congress (2026, April 27-29), Istanbul, Turkey.



[13] Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information, available at <https://eur-lex.europa.eu/eli/dir/2019/1024/oj/eng/>



Appendix 1 - Excel data and metadata assessment form

NAP LINK	TYPE OF NAP
	Metadata Directory Data Platform Hybrid

DATA AVAILABILITY	
MMTIS - Multimodal Travel Information Services	
Categories	Available
1. Static, historic and observed travel and traffic data	
1.1 Level of service1	No
(a) Location search (origin/destination)	No
(i) Addresses (building number, street name, postcode)	
(ii) Topographic places (city, town, village, suburb, administrative unit)	
(iii) Points of interest (related to transport information) to which people may wish to travel	
(b) Trip plans: operational calendar, mapping day types to calendar dates	
(c) Location search (access nodes) – for scheduled transport and transport on demand where relevant	No
(i) Identified access nodes	
(ii) Geometry/map layout structure of access nodes	
(d) Trip plan computation – for scheduled transport and transport on demand where relevant	No
(i) Connection where interchanges may be made	
(ii) Default transfer times at interchanges	
(iii) Network topology and routes/lines (topology)	
(iv) Transport operators	
(v) Timetables	
(vi) Planned interchanges between guaranteed scheduled services	
(vii) Hours of operation	
(viii) Facilities of access nodes (including platform information, help desk/information points, ticket booths, lifts/stairs, entrances and exit locations)	
(ix) Vehicles, including their accessibility (such as low floor, wheelchair accessible, pram accessible) and accessibility of on-board services (such as toilets)	
(x) Accessibility of access nodes, and paths within an interchange (such as existence of lifts, escalators)	
(xi) Existence of assistance services (such as existence of on-site assistance)	
(e) Trip plan computation	No
(i) Road network (including segregated lanes for bus/taxi)	
(ii) Cycle network (cycle tracks, cycle lanes, bus-and-cycle lanes, on-road shared with vehicles, on-path shared with pedestrians)	
(iii) Pedestrian network and accessibility facilities	
1.2 Level of service 2	No
(a) Location search – for transport on demand and personal transport	No
(i) Location of parking places (on and off-street), including accessible parking places for persons with disabilities and persons with reduced mobility	
(ii) Park & Ride stops	
(iii) Park & Drive stops	
(iv) Bike-sharing stations	
(v) Car-sharing stations	
(vi) Secure bike parking (such as locked bike garage)	
(vii) Scooter parking zones	
(b) Information service	No
(i) Where and how to buy tickets for scheduled transport, including retail channels, fulfilment methods, payment methods	
(ii) Where and how to pay for parking, including retail channels, fulfilment methods, payment methods	
(c) Auxiliary information – for scheduled transport and transport on demand where relevant	No
(i) Basic common standard fares: fare network data (fare zones/stops and fare stages) / standard fare structures (point to point including daily and weekly fares, zonal fares, flat fares)	
(ii) Vehicle facilities, including classes of carriage, on-board Wi-Fi, capacity and access conditions for bicycles	



1.3 Level of service 3	No
(a) Detailed common standard and special fare query – for scheduled transport and transport on demand where relevant	No
(i) Passenger classes (classes of passenger such as adult, child, senior, student, military/veteran, passenger with disability and passenger with reduced mobility, and qualifying conditions, and classes of travel)	
(ii) Common fare products (access rights such as zone/point-to-point including daily and weekly tickets/single/ return, eligibility of access, basic usage conditions such as validity period/operator/time of travel/ interchanging, standard point-to-point fares prices for different point-to-point pairs including daily and weekly fares/zonal fare prices/flat fare prices)	
(iii) Special fare products (offers with additional special conditions such as promotional fares, group fares, season passes, aggregated products combining different products, and add-on products such as parking and travel, minimum stay)	
(iv) Basic commercial conditions such as refunding, replacing, exchanging or transferring	
(v) Basic booking conditions such as purchase windows, validity periods, routing restrictions zonal sequence fares, minimum stay	
(b) Information service – for transport on demand: how to book demand-responsive transport services, including retail channels, fulfilment methods, payment methods	
(c) Trip plans	No
(i) Detailed cycle network attributes (surface quality, side-by-side cycling, shared surface, on/off road, scenic route, “walk only”, turn or access restrictions, e.g. against flow of traffic)	
(ii) Parameters needed to calculate an environmental factor such as greenhouse gas emissions per vehicle type or passenger mile or per distance walked	
(iii) parameters needed to calculate fuel consumption of conventional and alternative fuels emissions per vehicle type or passenger mile or per distance walked	
(d) Trip plan computation: estimated travel times by day type and time-band by transport mode/combination of transport modes	
1.4 Level of service 4	No
(a) Historic travel and traffic data on delays – for scheduled transport and transport on demand where relevant	
(b) Observed data on delays and passing time – for scheduled transport	No
(i) Length of, and when possible the reason for, delays of at least 60 minutes for rail passenger services (in accordance with Article 19 of Regulation (EU) 2021/782)	
(ii) Length of, and when possible the reason for, delays in departure of more than 90 minutes for sea and inland waterways passenger services (in accordance with Article 18 of Regulation (EU) No 1177/2010)	
(iii) Length of, and when possible the reason for, delays in departure from a terminal of more than 120 minutes for regular bus and coach passenger services with a scheduled distance of 250 km or more (in accordance with Article 19 of Regulation (EU) No 181/2011)	
(iv) Length of, and when possible the reason for, flight delays at departure of at least 120 minutes; and flight delays at arrival of at least 180 minutes (in accordance with Articles 5 and 6 of Regulation (EC) No 261/2004)	
(c) Observed data on cancellations – for scheduled transport	No
(i) Cancellations, and when possible the reason, of rail passenger services	
(ii) Cancellations, and when possible the reason, of sea and inland waterways passenger services	
(iii) Cancellations, and when possible the reason, of regular bus and coach services with a scheduled distance of 250 km or more	
(iv) Cancellations, and when possible the reason, of flights	
(d) Information on parking tariffs	
2. Dynamic travel and traffic data	
2.1 Level of service 1	No
Passing times, trip plans and auxiliary information	No
(i) Disruptions, such as network closures and/or diversions, and when possible, the reason	
(ii) Real-time status information, such as estimated departure and arrival times of services, delays, cancellations, guaranteed connections monitoring	
(iii) Status of access node features (including dynamic platform information, operational lifts/escalators, closed entrances and exit locations) – for scheduled transport	
2.2 Level of service 2	No
(a) Information service on parking tariffs – for transport on demand and personal transport	
(b) Availability check and location – for transport on demand and personal transport where relevant	No
(i) Car-sharing availability and location, bike-sharing availability and location, scooter-sharing availability and location, and other vehicle-sharing availability and location	
(ii) Car parking spaces available (on and off-street)	
2.3 Level of service 3	No
Occupancy information of the vehicle – for scheduled transport and transport on demand where relevant	



DATA AVAILABILITY SSTP - Safe and Secure Truck Parking Categories	Available
1. Static data	No
(a) Identification information of parking area (name and address of the truck parking area)	
(b) Location information of the entry point in the parking area (latitude/longitude)	
(c) Primary road identifier1/direction, and primary road identifier2/direction if same parking accessible from two different roads	
(d) If needed, the indication of the Exit to be taken / Distance from primary road (km or miles)	
(e) Total number of free parking places for trucks	
(f) Price and currency of parking places	
2. Information on safety and equipment of the parking area	No
(a) Description of security, safety and service equipment of the parking including national classification if one is applied	
(b) Number of parking places for refrigerated goods vehicles	
(c) Information on specific equipment or services for specific goods vehicles and other	
2.1 Contact information of the parking operator	No
(a) Name and surname of the parking operator	
(b) Telephone number of the parking operator	
(c) E-mail address of the parking operator	
(d) Consent of the operator to make his contact information public (Yes/No)	
3. Dynamic data on availability of parking places	No
(a) Data on whether a parking is: full, closed or number of free places which are available	

DATA AVAILABILITY SRTI - Safety-related Traffic Information Categories	Available
1. Safety Related Traffic Information	No
(a) Temporary slippery road	
(b) Animal, people, obstacles, debris on the road	
(c) Unprotected accident area	
(d) Short-term road works	
(e) Reduced visibility	
(f) Wrong-way driver	
(g) Unmanaged blockage of a road	
(h) Exceptional weather conditions	

DATA AVAILABILITY RTTI - Real-Time Traffic Information Categories	Available
1. Data on infrastructure - road network links and their physical attributes	No
(a) road network links and their physical attributes	No
(i) Geometry	
(ii) Road width	
(iii) Number of lanes	
(iv) Gradients	
(v) Junctions	
(b) Road classification	
(c) Location of tolling stations	
(d) Location of service areas and rest areas	
(e) Location of recharging points for electric vehicles and the conditions for their use	
(f) Location of compressed natural gas, liquefied natural gas, liquefied petroleum gas stations	
(g) Location of refuelling points and stations for all other fuel types	
(h) Location of delivery areas	
2. The crucial types of data on regulations and restrictions	No
(a) Static and dynamic traffic regulations, where applicable:	No
(i) Access conditions for tunnels	
(ii) Access conditions for bridges	
(iii) Permanent access restrictions	



(iv) Speed limits	
(v) Freight delivery regulations	
(vi) Overtaking bans on heavy goods vehicles	
(vii) Weight/length/width/height restrictions	
(viii) One-way streets	
(ix) Boundaries of restrictions, prohibitions or obligations with zonal validity, current access status and conditions for circulation in regulated traffic zones	
(x) Direction of travel on reversible lanes	
(b) Traffic circulation plans	
3. Other types of data on regulations and restrictions	No
(a) Location and identification of traffic signs reflecting traffic regulations and identifying dangers	No
(i) Access conditions for tunnels	
(ii) Access conditions for bridges	
(iii) Permanent access restrictions	
(iv) Other traffic signs reflecting traffic regulations	
(b) Static and dynamic traffic regulations, other than the regulations referred to in 2.	
(c) Identification of tolled roads, applicable fixed road user charges and available payment methods	
(d) Variable road user charges and available payment methods	
4. Crucial types of data on the state of the network	No
(a) Road closures	
(b) Lane closures	
(c) Roadworks	
(d) Temporary traffic management measures	
5. Other types of data on the state of the network	No
(a) Bridge closures	
(b) Accidents and incidents	
(c) Poor road conditions	
(d) Weather conditions affecting road surface and visibility	
6. Real-time use of the network data	No
(a) Traffic volume	
(b) Traffic speed	
(c) Location and length of traffic queues	
(d) Travel times	
(e) Waiting time at border crossings	
(f) Availability of delivery areas	
(g) Availability of recharging points for electric vehicles	
(h) Availability of refuelling points and stations for alternative fuel types	
(i) Price of ad hoc recharging/refuelling	

DATA AVAILABILITY	
AFIR - Alternative Fuels Infrastructure	
Data types	Available
(a) Static data for publicly accessible recharging and refuelling infrastructure for alternative fuels operated by them:	No
(i) Legal name of the recharging or refuelling point operator or owner	
(ii) Commercial name of the recharging or refuelling point operator or owner	
(iii) Number of recharging or refuelling points	
(iv) Service support	
(v) Helpdesk telephone	
(vi) Facilities offering associated services to the user	
(vii) Global navigation satellite system (GNSS) geographic location information	
(viii) Additional geographic location information	
(ix) Country	
(x) Region	
(xi) City or town	
(xii) Postal code	
(xiii) Address name	
(xiv) Opening time	
(xv) Time zone	
(xvi) Vehicle-type compatibility	



(xvii) Vehicle specifications permitted	
(xviii) Number of parking spaces	
(xix) Number of parking spaces for people with disabilities	
(xx) Payment device with bank card reader	
(xxi) Payment device with a contactless functionality that is at least able to read payment cards	
(xii) Other ad hoc payment option	
(xxiii) Additional information about payment providers accepted	
(xxiv) Contract-based (subscription) payment option	
(b) Further static data for publicly accessible recharging infrastructure operated by them:	No
(i) Recharging point ID code (connector)	
(ii) Number of connectors	
(iii) Type of connector (plug)	
(iv) Type of current	
(v) Recharging station maximum power	
(vi) Recharging point maximum power	
(vii) Mobility service providers offering contract-based recharging	
(viii) Plug-and-charge	
(ix) Smart recharging services	
(x) Electricity supplied is 100 % renewable	
(c) Further static data for publicly accessible hydrogen refuelling infrastructure operated by them:	No
(i) Hydrogen state	
(ii) Hydrogen pressure	
(iii) Daily cumulative capacity	
(iv) Hydrogen supplied is 100 % renewable	
(d) Further static data for publicly accessible refuelling infrastructure for liquefied methane:	No
(i) Liquefied methane supplied is 100 % renewable	
(e) Further static data for publicly accessible refuelling infrastructure for alternative fuels operated by them:	No
(i) Type of connector (dispenser)	
(f) Dynamic data for publicly accessible recharging and refuelling infrastructure for alternative fuels operated by them:	No
(i) Operational status	
(ii) Availability	
(iii) Ad hoc price	
(g) Further static data for publicly accessible refuelling infrastructure for alternative fuels operated by them:	No
(i) Limited amount of hydrogen available	

METADATA AVAILABILITY

Is metadata available?

Is the metadata complete and consistently applied to all the datasets?

Which metadata standard is used?

Can users export the metadata catalogue?

Is the metadata catalogue publicly accessible?

Does the NAP provide an API for accessing metadata?

COMMENTS (OPTIONAL)

Please use this cell to share some more insights about your NAP, particularly related to data and metadata availability.

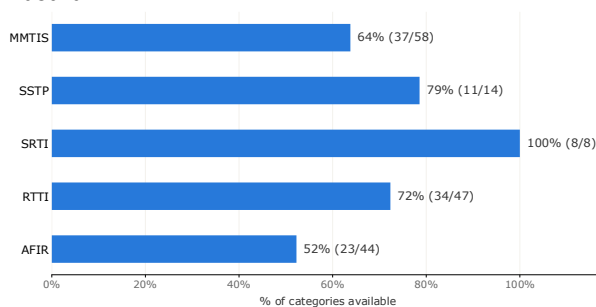
What is the best feature of "your" NAP?

Please use this cell to share some thoughts on what you think is the best feature of your NAP.

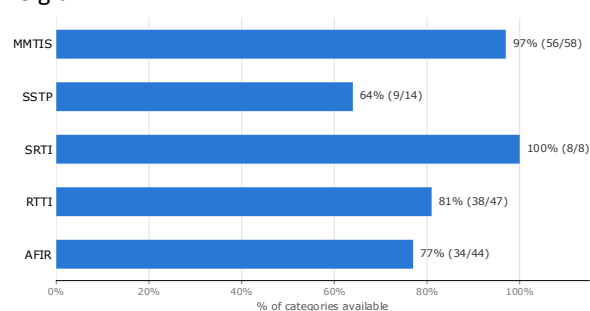


Appendix 2 - Data categories available, charts by country

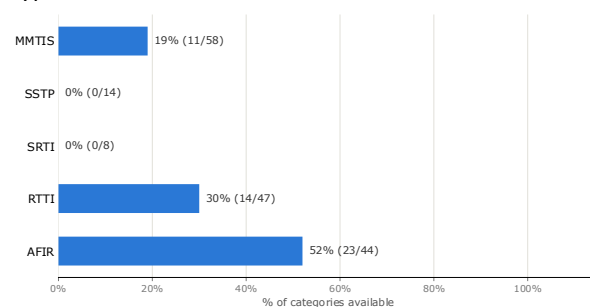
Austria



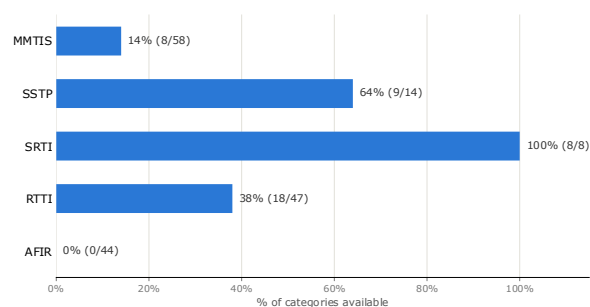
Belgium



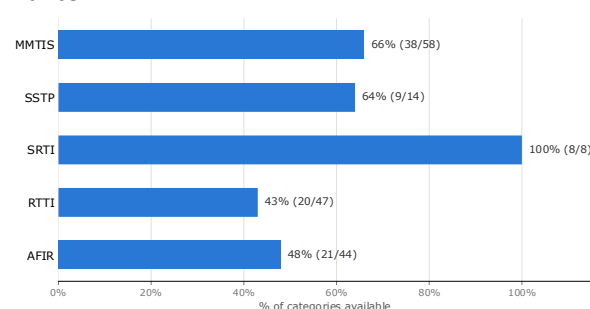
Cyprus



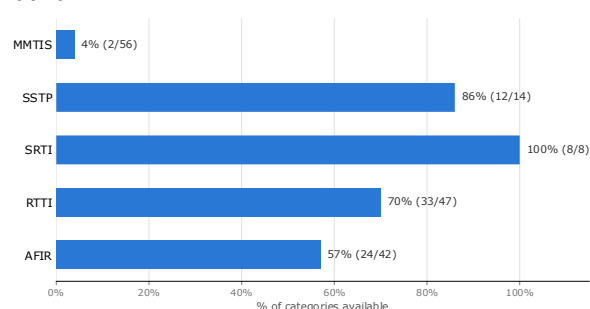
Czechia



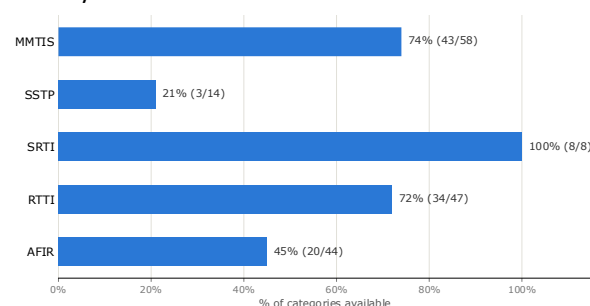
France



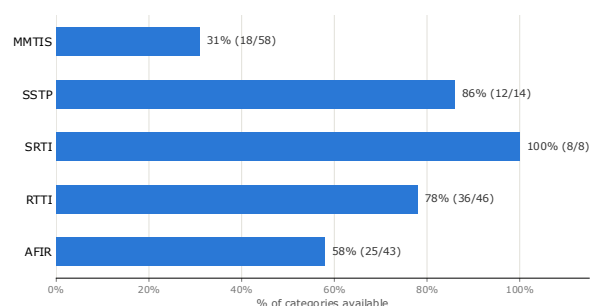
Latvia



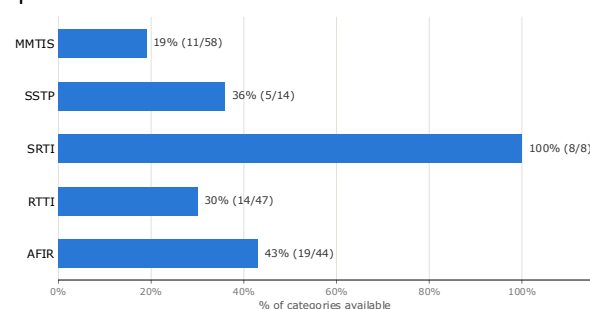
Norway



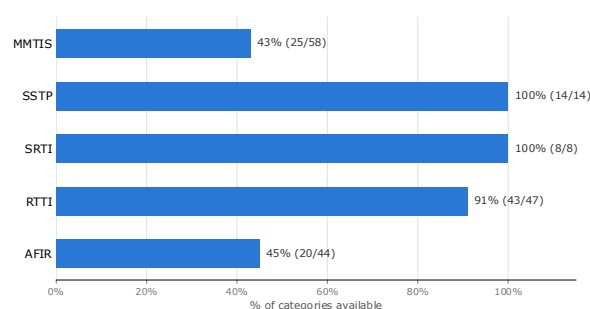
Slovenia

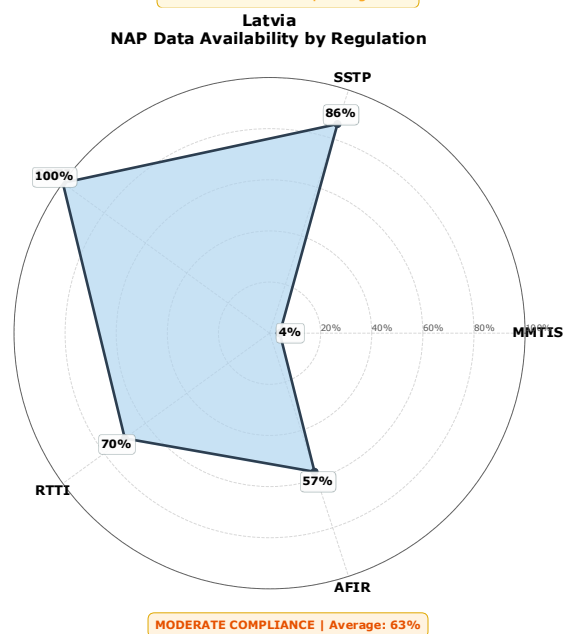
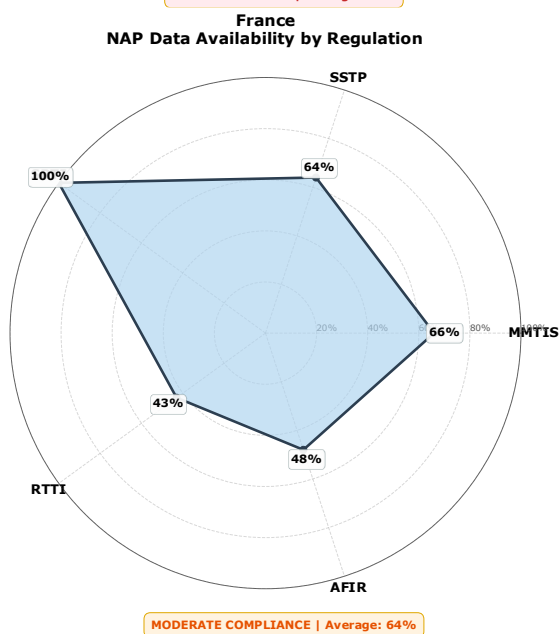
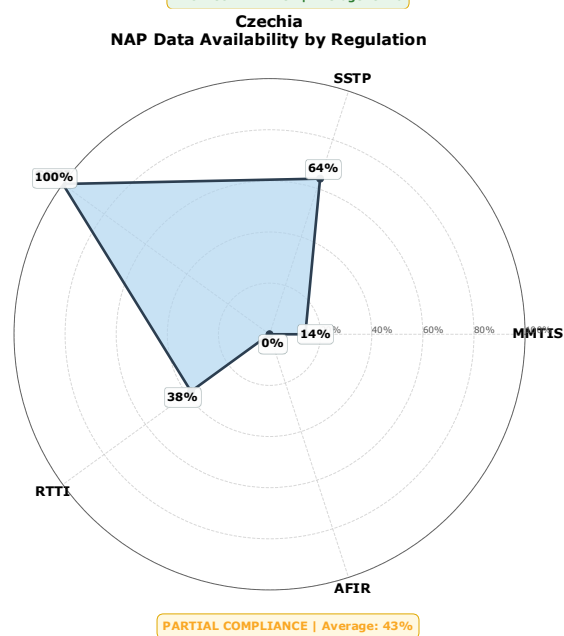
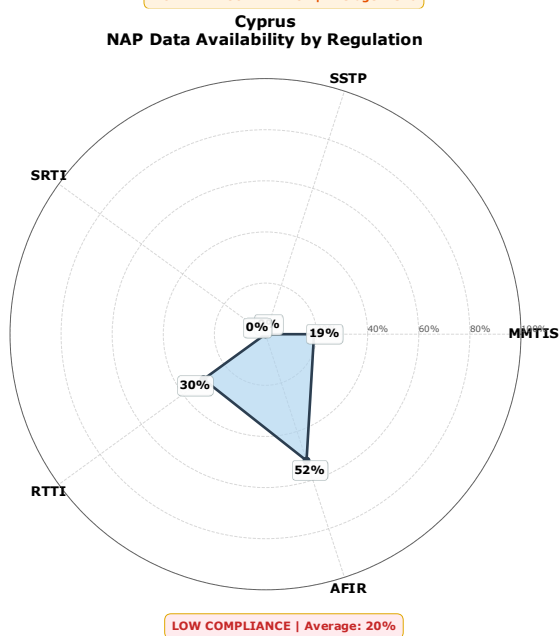
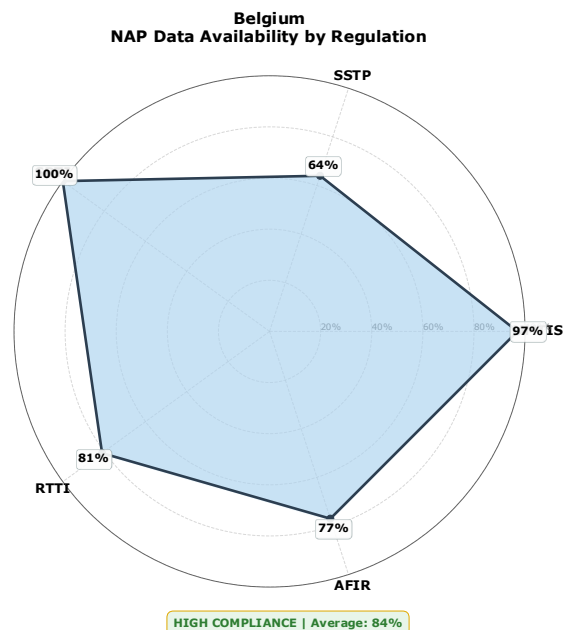
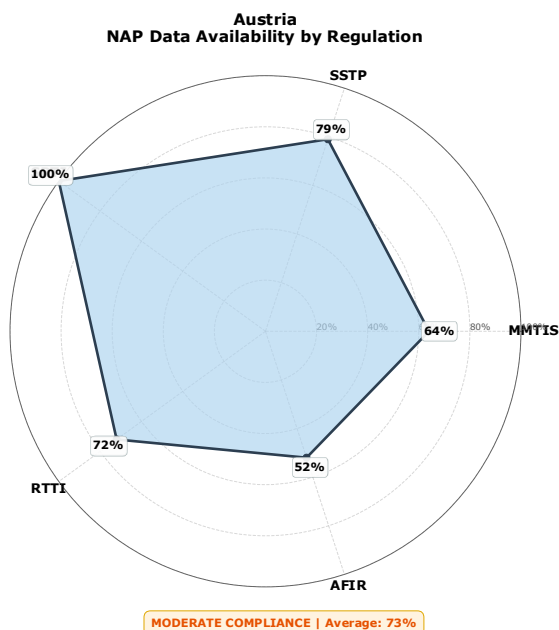


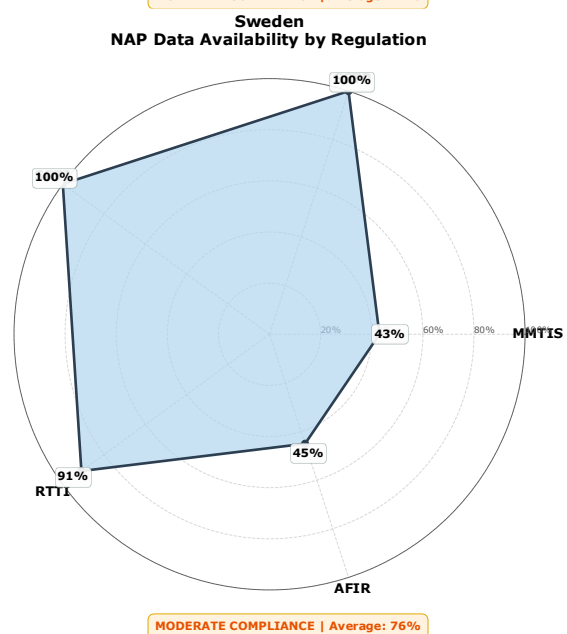
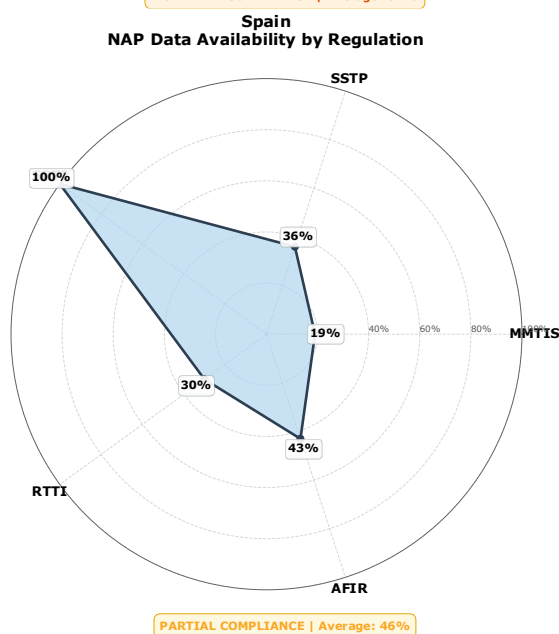
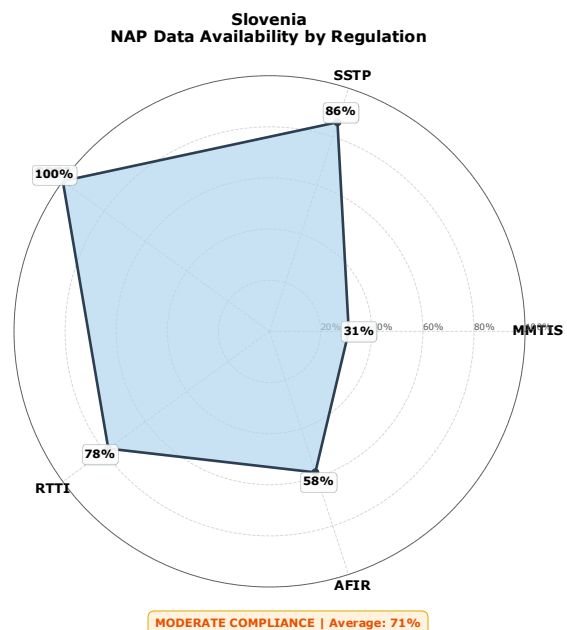
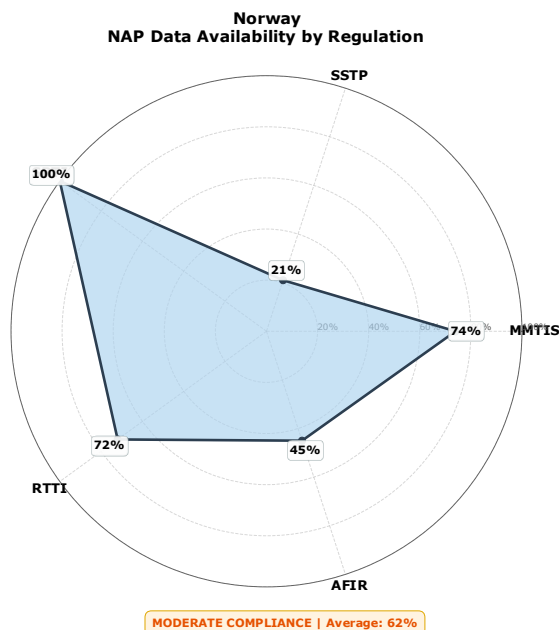
Spain



Sweden







Note: In the Figures above compliance must be understood in relation to the availability reported in relation to the question “Does the NAP provide datasets related to the following data categories?”, retrieved from the Delegated Regulations and the AFIR Regulation.

Appendix 3 - Data categories available, MMTIS, per Level of Service

