NAP Reference Architecture

This report defines one of the Views of the NAP Reference Architecture

10.02.2025

# NAP Motivation Layer

The Motivational Layer models the motivations, reasons for the necessity of the NAP, and the expectations to be fulfilled by its successful deployment and implementation.

Several stakeholders are depicted in the diagram, gathered around the NAP because they share a common vision. However, each stakeholder interacts with the NAP differently and has unique expectations. Together, they define the NAP as an ITS service, and this definition serves as the primary guideline for all other views in the architecture.

For this view we do **not distinguish** between **both NAP types**, Metadata Directory and Data Platform.



Figure: NAP Motivation Layer

## Selected terms and definitions

**Mobility data** Mobility data includes all data types that are directly related to a person or good movement via motorized or non-motorized, individual or public transport, or new transport modes. It includes general real-time and statistical information.

**Content Provider (Data Holder)** any stakeholder that is required by the delegated regulations to provide data/information or services to the Content Consumers via NAP. It includes the Data Holder term as it is defined in MMTIS and RTTI regulations. For more information see the explanation in the Content Provider role.

**Content Consumer (Data User)** any stakeholder that is specified by the delegated regulations explicitly as the user of the data/services made available by Content Providers via NAP. It includes the Data User term as it is specified in MMTIS and RTTI regulations. For more information see the explanation in the Content Consumer role.

**EA GUID** Enterprise Architect unique identifier, uniquely identifying the object within the model

**ITS Actor, Actor** part of an ITS value-added chain/network and is directly involved in value creation. It contributes to the added value of ITS benefits by using its ITS capabilities as part of its activities. It usually also represents the interests of ITS stakeholders who are not directly involved in the ITS value chain but have strong associated interests. The ITS end-user is also considered a special ITS actor.

**Stakeholder** is an organization or individual interested in the deployment, operation, or outcomes of ITS services. They can be directly or indirectly affected by the decisions made during the entire lifecycle of ITS Services. They are usually decision-makers such as politicians, high-level managers, and others e.g., the general public or user groups, who typically have little or no knowledge of systems design and implementation beyond what they have acquired as end users.

**ITS Vision** is the long-term objective and the aspirational goal for the future. The ITS Vision is shared by all ITS Stakeholders. It is a source of inspiration for the ITS Services and provides a clear goal to be adhered to by the ITS Services.

**ITS Mission Statement** is a short statement that highlights what is needed to be done by the ITS Stakeholders in the present to achieve the ITS Vision. It summarizes the purpose of the existence of the ITS Services and guides their use by the ITS Actors and/or the end users. It formulates a clearly structured, overarching policy objective of the defined ITS service deployment, considering the interests of stakeholders and end-users.

**Business Expectations** are what the ITS Stakeholders aim to achieve by the implementation/operation of the ITS Service. Business Expectations could be the political, economic, social, socio-economic, socio-political, operational, organisational, safety, and efficiency-related added values that are associated with an ITS service and are formulated as goals. These expectations are used together with the ITS Mission Statement to define the ITS Service

**ITS Service** is a formal description of an ITS service. It describes a value-added service provided by ITS actors to the end-users. The added value is created by combining technologies, organizations, processes, and people. The service can be delivered by a single actor or in cooperation with others, and it creates added value that may consist of individual benefits for end users, collective benefits for end-user groups or society, or a mixture of both. It describes the idea and functional elements of the ITS service as well as framework conditions.

**ITS Domain** is a concept that categorizes the diverse applications of ITS into specific fields of application. It applies sector-specific knowledge and additional architectural knowledge to ITS. The domain also defines the boundaries of the ITS system or service at the start of an ITS architecture project, distinguishing it from similar or adjacent systems or services.

**ITS Service Added Value** represents monetary and nonmonetary benefits that are gained by the implementation of the ITS Service. Each individual ITS Service Added Value outlines a particular, impact/benefit of implementing the ITS Service affecting one or more stakeholders.

## ITS Service Elements

In this chapter are definitions  **Vision** and **Mission** of **ITS Service** the former two lead to and of **ITS Domain** in which the ITS Service operates.

### Fulfilling National Access Point obligations according to ITS directive

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The National Access Point of a Member State has specific tasks related to the Delegated Regulations of the ITS Directive 2010/40/EU, which are requested by the European Commission.

The main task is to provide non-discriminatory central access information to data listed in Delegated Regulations.

* NAP features shall be language-independent (English + local language)
* NAP supports the discovery of metadata and data samples without user registration
* NAP supports data exchange based on standards
* NAP fosters EU-wide interoperable ITS services for travellers
* NAP makes standardized (in prescribed formats) data accessible
* NAP data content is extendable to all ITS Directive domains
* NAP does not infringe the rights of the data owner for the use of data but can support the exchange (e.g. by a standardized license, agreed terms and conditions, technical support with a machine-readable interface definition.)

### National Access Point mission statement

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National Access Points (NAPs) will be established across Europe, facilitating access, easy exchange, and reuse of transport-related data, thereby supporting the provision of EU-wide interoperable travel and traffic services to end users.

### Seamless EU-wide provision of data and services

*Date Modified: 12.01.2025 18:21:02, GUID: {BFC9524E-A1D0-415a-9CAA-50D01DACE293}*

To create a Single European Transport Area, underpinned by a digital layer that interlinks all elements of transport. This digital architecture, built on open and common standards and interfaces, will foster an efficient and secure data ecosystem.

### Traffic and traveller information

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**Transport Network**

European road and railroad, tram and underground and ferry transport networks and extensible to Public Transport and Interfaces of other modes e.g. air and waterways.

**ITS Service**

EU-wide ITS services coverage with seamless handover between different member states for easier and consistent ITS service building at neighbouring regions, states, and at the EU level.

**ITS Service Type**

static, dynamic data and information sets as well as services of public and private stakeholders including parking, safety-related traffic information, real-time traffic information, and multimodal travel information.

**Level of detail**

Organizational view of NAP stakeholders and their cooperation, including a functional definition of the ITS service at the meta-level and including their data content coverage/contribution in the defined ITS domain.

**Perspective**

Policy perspective, with contribution from public and private stakeholders in the service development and delivery.

**Focus**

Cooperation between roles and Information systems, interfaces, and standards to foster regular data exchange.

## Stakeholders

In this chapter is the definition of **Stakeholders** involved in the ITS Service.

### Competent Authority / National Body

*Date Modified: 12.01.2025 18:31:03, GUID: {60AC1314-7147-4d43-89C6-2CD3B26BDEBE}*

A National Body (NB) typically refers to an organization, institution, or entity that operates at a national level. These bodies are established by the government or recognized by authorities to oversee, manage, regulate, or represent various aspects of national affairs. In this context, the main task of an NB is to support the quality of mobility data and services through an assessment process.

In line with the legal framework of the ITS Directive 2010/40 amended by Directive (EU) 2023/2661 and related Delegated Regulations NB operates in the field of mobility. A NB is designated by a government and has to be impartial and independent from data providers and service providers.

### Content Consumer

*Date Modified: 12.01.2025 18:23:36, GUID: {77E9CEBA-B991-4860-A6D3-952CAD1B776E}*

Content consumers are national and international organizations using NAP-promoted data for added value services to their customers or parties using NAP-promoted data for enhancing their operational capabilities. Content Consumer includes the Data User term as it is specified in MMTIS and RTTI Regulations.

Content Consumers based on the perceived benefit could be grouped as follows:

* **Service providers:** These companies expect to utilize high-quality and verified information provided by NAP to provide traffic information services to its customers and update the road map information to make their journey more efficient.
* **Companies engaged in providing transport services and entities ensuring transport services:** These companies expect to utilize high-quality and verified information provided by NAP to ensure the availability of up-to-date information at transfer or multimodal public transport terminals as well as at parking areas along the network under ITS Directive. NAP data are intended by transport providers in the field of improving the organisational transport processes, managing access to the provided transport service through relevant information systems, and enhancing the overall attractiveness of services from the perspectives of passengers or drivers of freight vehicles - end users.
* **Vehicle manufacturers and their suppliers:** Infotainment, driving assistance systems, communication equipment, and cooperative ITS systems are now part of vehicle equipment. From the manufacturers' perspective, information services enhance the product's attractiveness to customers and fulfil specific operational needs (such as fleet management). Manufacturers and suppliers have a keen interest in both static and dynamic traffic information across the entire transportation system accessible via open data sources. Based on NAP data manufacturers can show the value of a vehicle to their customers because information, navigation, driving, reservation, or logistics systems can operate when receive proper NAP data.
* **Public Administration:** Public administration is the provider of public services, managing public affairs at both local and central levels, and ensuring matters in the public interest. These activities include the care for the development and operation of the transportation system, which is a key sector of the economy. NAP data can be used for planning the development of the road network or for optimizing the maintenance or reconstruction of individual sections of this network.
* **Scientific and Research institutions:** They are primarily established to create professional expertise, address research tasks, and acquire knowledge. The transport system, management models, and transport process organisation are natural interests of these institutions, as is the creation and development of European-wide information services related to transport and mobility. These organisations are interested in utilizing all provided NAP data, both for studies and analytical background on the transportation system in general, as well as for the verification of functionality and assessment of the transport system quality.
* **End Users:** The drivers and travellers (natural persons) that receive traffic or travel information via a third party. The end users are not direct users of NAP, but they are the primary beneficiaries.

### Content Provider

*Date Modified: 12.01.2025 18:23:45, GUID: {4D7E0B7A-7D34-400b-AE00-68E04F93B7BA}*

Content Providers are national and international organizations, data holders, data, and service providers who are required by the Delegated Regulations of the ITS Directive to make data and/or service accessible via the National Access Point. Content Provider includes the Data Holder term as it is specified in MMTIS and RTTI Regulations.

According to the obligation to the Delegated Regulations Content providers are represented by:

* **Public and private road operators, service providers, and broadcasters** dedicated to traffic information [886/2013 (SRTI)]
* **public and private service providers, parking operators**, **and road operators** [887/2013 (SSTP)]
* **road authorities, road operators, digital map producers, and public or private service providers, where** ‘service provider’ means any **public or private provider of a real-time traffic information service**, excluding a mere conveyer of information, to users and end-users [2022/670 (RTTI)]
* **transport authorities, passenger transport operators, infrastructure managers, transport-on-demand service providers, and travel information service providers**. [2017/1926 (MMTIS)]

### European Commission

*Date Modified: 12.01.2025 18:03:57, GUID: {26DD1383-1637-4356-B2EF-7671DCA5C5BC}*

The European Commission (EC) is part of the executive branch of the European Union (EU) responsible for proposing new European legislation, implementing the decisions of the European Parliament and the Council of the EU, and managing EU policies and budget.

### Member State

*Date Modified: 12.01.2025 18:04:12, GUID: {2DC22194-A127-42ba-9AEA-E8CBDD2EC795}*

A Member State of the European Union is a sovereign country that is a member of the European Union (EU), a political and economic union. There are 27 member states as of 2023. These states are party to the EU’s founding treaties and are subject to the rights and obligations of membership, including access to the EU single market. They have agreed to share their sovereignty through the institutions of the EU in certain aspects of government.

### NAP Operator

*Date Modified: 12.01.2025 18:04:28, GUID: {4B4D9772-CCE6-459c-B5E0-80E3C5C32674}*

A NAP is a mechanism set up by Member States to facilitate access, exchange, and reuse of transport-related data. The NAP Operator ensures that these points function efficiently and effectively, maintaining the robustness and resilience of the transport data infrastructure.

## Business Expectations

In this chapter are definitions of Stakeholders of Business Expectations of the ITS Service.

### Access to the content providers and their services

*Date Modified: 09.04.2024 15:10:53, GUID: {BEEC92A0-2D8F-4223-80CC-93C134836DD3}*

The National Body expects better and easier access to the content providers and their services (with their description and (observed) qualitative parameters) as they are being promoted through NAP, instead of finding and reaching out to the content consumer separately.

### Better data visibility and usability

*Date Modified: 12.01.2025 18:07:51, GUID: {A74A1B0F-B29F-4ef3-B785-89BF9BED3ACC}*

Content Providers expect to fulfil obligations stipulated by the ITS Directive and related Delegated Regulations and as side effects increase the visibility of their data by publishing them (or respective metadata) at the NAP and increase the usability of their data by adopting EU-wide recommended standards and profiles.

### Better mobility services for citizens

*Date Modified: 12.01.2025 18:08:05, GUID: {B1BC2597-7347-4c5e-AD8F-54DD1CD5430C}*

Member State is the main protagonist in creating and implementing European Policy through the European Parliament and legislature development process. It has similar expectations to the European Commission e.g. more efficient transport and fewer accidents. It also has expectations targeted to increased use of governmental data as well as data from private parties. Better cross-border traffic management and increased MS cooperation.

### Clear set of requirements

*Date Modified: 12.01.2025 18:08:25, GUID: {C5BF4F37-E65D-4998-BC18-CF0C0F8F8AF9}*

The NAP Operator is the main facilitator of the data and service exchange between provider and consumer. They expect an easy / defined operational and legislative environment laid out by Member States.

### Easy access to harmonized services

*Date Modified: 12.01.2025 18:09:07, GUID: {BC8FFFD0-5AB4-49dc-B949-BEB69CF1D447}*

The Content Consumer expects all mobility data or services accessible online at one place (NAP), uniformly described, accessible to all, and with content aligned by recommended standards and/or relevant profiles.

### EU-wide coverage and harmonized delivery of ITS services

*Date Modified: 12.01.2025 18:09:23, GUID: {40E6AD55-91B5-46d0-97FB-DAD263613E62}*

The European Commission is the main policy facilitator, it proposes and implements legislation. The EC expectations are stipulated within the EU mobility strategy documents and are ultimately focused, regardless of age, health, and gender, on reducing the environmental impact of European transport and reducing fatalities and accidents on European roads through the facilitation of easy-to-access-EU-wide harmonized traffic and travel data exchange. The European Commission establishes a common framework for EU harmonisation legislation for placing services on the market at the EU level to ensure that EU-wide ITS information service is provided following the EU specifications.

## ITS Added Value

In this chapter are definitions of **ITS Service Added Values** i.e. benefit of implementing the ITS Service affecting one or more stakeholders.

### Better cross border cooperation

*Date Modified: 12.01.2025 18:25:51, GUID: {1DCCB4B5-41EA-443b-999D-B9DECF471654}*

By sharing data with neighbouring countries, state planning services could increase the level of cooperation across borders. Enhance cooperation between public and private stakeholders in ITS.

### Better defined operational environment

*Date Modified: 18.06.2024 22:53:55, GUID: {FA246A00-5F05-4b78-B8B6-0C34D4F4BFDF}*

By introducing a legal and operational framework by the Member State when implementing the ITS Directive the nominated NAP Operator gets a clear set of requirements and obligations and practices to operate NAP as set up by the legal framework.

### Better oversight on the ITS Directive implementation

*Date Modified: 12.01.2025 18:26:11, GUID: {A714C199-95DF-45f6-8CD4-8777446E0378}*

By establishing one NAP, per member state, concentrating mobility data from all obligated content producers (see Content Provider stakeholder) the EC has easier access to evaluating how are stipulations of the delegated regulations being fulfilled in the member states and MS has an easier way to report about these obligations to the EC.

### Better service/data applicability

*Date Modified: 12.01.2025 18:26:20, GUID: {5621BC53-FB7E-4897-8C7E-760AC4A9C63A}*

By aligning to required formats and data specifications, the data or services get better usability by content consumers.

### Companies engaged in providing transport services and entities ensuring transport services benefit

*Date Modified: 12.01.2025 18:26:44, GUID: {86E4D6B0-ED82-4d90-BD37-D74AC3549849}*

Companies engaged in providing transport services and entities ensuring transport services benefit. Public transport dispatchers from traffic controller stations can better manage the PT fleet operations and ensure guaranteed transfers at terminals due to NAP up-to-date data/information about incidents and congestions that are currently causing delays of public transport vehicles. In this context, NAP information makes public transport more attractive and reliable. Also, truck dispatchers could better manage and organise freight transport based on information received from the NAP, in particular limitations for commercial vehicles on roads, bridges, and in tunnels.

### Easier access to content providers

*Date Modified: 12.01.2025 18:27:07, GUID: {507180A7-8EFB-4d7b-8902-37863826AB81}*

By having all relevant data and services listed at NAP including the contact information of the data and services providers, the National Body can easily select the data to evaluate and reach out to their owner/provider.

### Easier validation process

*Date Modified: 12.01.2025 18:27:17, GUID: {3D099575-489C-439e-B206-917BBA99E1AF}*

By having all information about the data and services of the content providers at NAP the National Body can perform compliance assessment easier.

### Enhanced findability of data and services

*Date Modified: 12.01.2025 18:27:29, GUID: {9846A13E-FF81-4e4c-A66A-6CA78395412E}*

By having all mobility data provided via the NAP the content consumers (Service providers) may use them to increase the value of their services to increase road safety and travel efficiency. Easier and more regular data exchange (e.g. ID verification of content providers once). Distribution of high-quality traffic data to a larger share of travellers.

### European Commission benefit

*Date Modified: 12.01.2025 18:28:02, GUID: {33CF1689-E6E9-4f50-8304-65272C5064B3}*

European Commission benefit. NAP data can be used to identify specific problems in transport networks and to propose EU-wide policy solutions, notably to define needs for major project spending, e.g. relevance and eligibility.

### Harmonized data for service provision

*Date Modified: 12.01.2025 18:28:18, GUID: {1A6AC210-FB97-4548-B8D1-D93EF2E51CCB}*

By fulfilling the obligations of the ITS Directive, the data and services shared via NAP are provided concerning a set of standards which makes it easier to integrate them into pan-European service. Better quality of ITS services for end users.

### Increased traveller comfort

*Date Modified: 12.01.2025 18:28:49, GUID: {5AED7075-81E8-4e4e-91D5-681CC60018C1}*

By having all modes of mobility data provided via the NAP, the multimodal service provider could provide better services to travellers, advising them of better, more convenient, travel options (accessibility and time) and thus increasing their comfort.

### Increased use of public data

*Date Modified: 12.01.2025 18:28:35, GUID: {33A07100-D868-4036-9001-3C4FA1ADB6F3}*

By having all relevant public mobility data listed at NAP and in a harmonized format, the data gets more value. It is easier to access and use by service providers in the end user-oriented services. Generating higher reuse of data created by public authorities. Enhance cooperation between public and private stakeholders in ITS.

### Insight into Best Practices

*Date Modified: 12.01.2025 18:29:24, GUID: {3160147A-9326-4fcf-8BF8-E5F0772B3EAF}*

By observing other data published at NAP, the content provider could analyse features of best practices to adopt them in their data. Also, the potential of content consumer feedback creates an opportunity to better the data. Regular quality management of ITS services and data content feedback procedures. Enhance experience with data exchange and improve the awareness of data value in the traffic domain.

### Lower negative traffic and travel externalities

*Date Modified: 12.01.2025 18:29:41, GUID: {719542A2-5B93-42f9-A7C5-207B4876615F}*

By making public and private data available via NAP and by increasing their visibility, the service provider could provide services based on more information, ultimately providing a better service to customers. This better service could result in a reduction of accidents, shorter travel time, and lower emissions.

More public and private stakeholders are involved in many EU MS with regular data exchange between them and used for creating high-quality ITS services. Enhanced road safety, traffic efficiency and reduced environmental impacts of transport by the extension to more public and private stakeholders in the distribution of traffic information and related ITS Services.

### Member State benefit

*Date Modified: 12.01.2025 18:29:53, GUID: {9C963A11-3E8E-4700-AC7F-66252C040E4A}*

Member State benefit. NAP data bring a wide range of information, resources, and decision-making approaches that lead to better outcomes. These data enable to perform analyses and predict the development of traffic. NAP data are also appropriate for transport organization planning and development of conceptual changes.

### Public (end users) benefit

*Date Modified: 12.01.2025 18:30:07, GUID: {8B9E0978-ED80-4621-B380-2B393ED06A32}*

Public (end users) benefit. Due to the availability and timely delivery of appropriate and technically harmonized static or dynamic NAP information/data users can have an insight into the current traffic situation or travel conditions and/or can use such information while driving or travelling, without being burdened with redundant information.

### Public Administration benefit

*Date Modified: 12.01.2025 18:30:23, GUID: {C0A4499B-2CA7-43e7-924C-EEBB0497229F}*

Public Administration benefit. Data from NAP may be used and more efficiently interconnected with other public administration information systems. These data are made available to other parties both from the public and the private sector, which strengthens the development of new services with added value.

### Scientific and Research institutions benefit

*Date Modified: 12.01.2025 18:30:39, GUID: {7E611DF3-9DDE-40bf-A855-BB079D9FBD73}*

Scientific and Research institutions benefit. Access to NAP data enables scientific and research teams to develop models of the traffic flow behaviour, assessment (based on historical data) of impacts of individual restrictions and their combinations on the level of provided services in the transport network, furthermore, prediction of traffic development, planning the transport of people and goods. These teams can produce a policy and scenario by estimating the impact of a transport policy scenario or a change in forecasting assumptions.

### Vehicle manufacturers and their suppliers benefit

*Date Modified: 12.01.2025 18:30:54, GUID: {D098ACC2-0448-4546-95D2-0A86426CF025}*

Vehicle manufacturers and their suppliers benefit. Concerning the competition in the automobile market vehicle/equipment manufacturers can offer their customers new advanced applications and systems using NAP data, which brings considerable added value to the producers and in particular consumers.

## Specifications & Requirements

In this chapter are definitions of Specifications and potential requirements affecting the implementation of the ITS Service.