



Multimodal data re-use study

How multimodal NAP data is re-used and what use-cases it supports?

Napcore Multimodal Forum

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Today's menu

1. **Introduction**
2. **Questionnaire and Interviews**
3. **Analysis and findings**
4. **Key results and recommendations**

Introduction

Target of the study in short

This study aimed to evaluate the current frameworks for international National Access Point (NAP) data re-use to identify and analyse successful cross-border multimodal journey planning applications across the European Union.

One key target was identifying of technical and governance best practices, and a key actions for replicating regional/national successes through broader multi-country integrations. How to make data even more usable for European mobility community?

Methodology overview

- Online survey targeting mobility service providers, NAP data re-users.
- Survey development was based on iterative feedback from the NAPCORE working group.
- Analysis of survey results to identify patterns, challenges and promising practices.
- Selection of interview participants based on survey responses and relevant experience.
- Selection and interview focus were refined through the project feedback from the NAPCORE working group.
- Semi-structured interviews to deepen and contextualise survey findings.
- Interview results analysed using a common evaluation framework.
- Final synthesis refined through consolidated feedback across project rounds from the NAPCORE working group.

Questionnaire and interviews

Questionnaire implementation, Schedule, Participants

Questionnaire Implementation

- The survey was implemented with online webtools using and targeted multimodal mobility stakeholders across the European Union.
 - National Access Point cooperated within Napcore network
 - In total, 77 organisations/participants responded.
 - All responses were anonymized in the final dataset, except when participants voluntarily provided their contact details for the purpose of a possible follow-up interview.
 - The survey was executed: 11.12.2025-11.1.2026

General information about respondents

Are you familiar with National and/or Regional Access Points in your country?



Are you an active contributor to National and/or Regional NAPs?

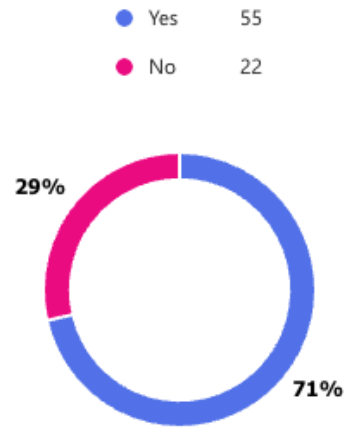


Are you providing data to the National Access Point?



- 77 Respondents / organisations
- 88% (68) knows about NAPs in their country
- 38% (29) are providing data to NAPs

Usage of different platforms



Are you using different platforms or data spaces besides NAPs?

- **71% (55 respondents) were using different platforms besides NAPs.**
- **Some mentioned platforms:**
 - DMI, Be-Mobile, Google, Here, MobilityDatabase, Own platform, directly from PTO's and mobility providers/Operators own dataspace, OpenStreetMap, Aerial Photography

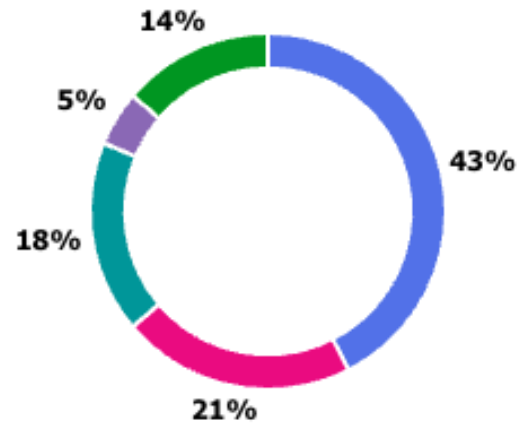
Analysis and findings

Analysis and findings in short

- In survey and interviews main target was to identify
 - Products and services using MMTIS NAP data
 - What kind of organizations are behind operations (public-private mix)
 - Service capabilities and data standards used
 - Scalability strengths and weaknesses and communicated reasons behind them
 - Other findings based on KPI framework (not part of this presentation)

Type of the product using NAP data

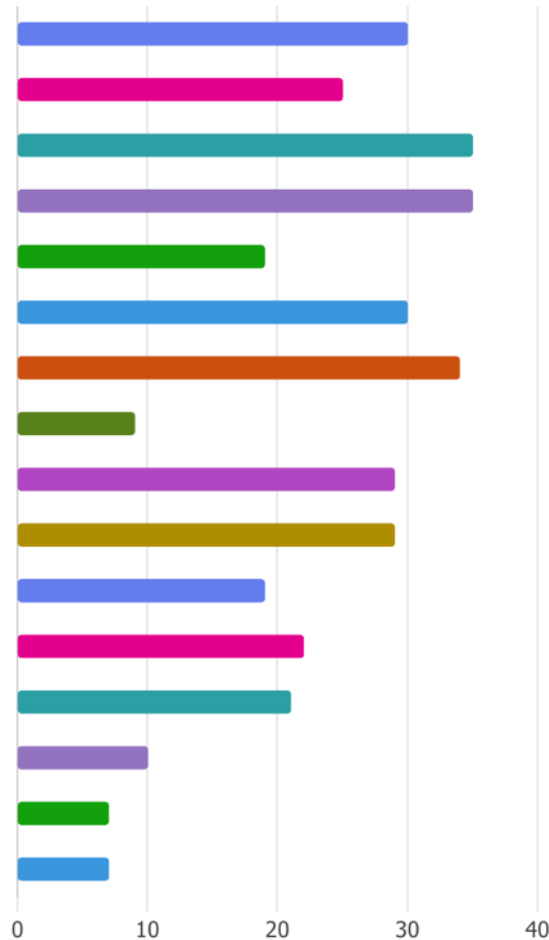
Route planner	34
Ticketing and payment	17
Travel search and payment	14
None of the above	4
Other	11



- Almost all the products were route planners (34/40 of the products)
- Many of the services included additionally functionality for
 - Ticketing and payment (17 respondents).
 - Travel search and payment (14 respondents)

Travel modes included

Walking	30
Cycling	25
Train long distance	35
Train commuter	35
Maritime including Ferries	19
Bus (coach)	30
Bus (commuter)	34
Air/Aviation	9
Tram	29
Metro	29
Trolleybus	19
Shared modes (city bikes, e-scooter, shared cars)	22
Transport on demand	21
Taxi	10
Car rentals	7
Other	7

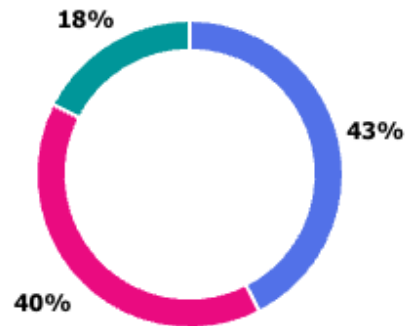


- Most services included long distance and commuter trains, 35 of the 40 services.
- Most of the services included additionally
 - Bus-commuter (34 respondents).
 - Bus-coach (30 respondents)
 - Walking (30 respondents)
 - Tram (29 respondents)
 - Metro (29 respondents)

Organization model and funding

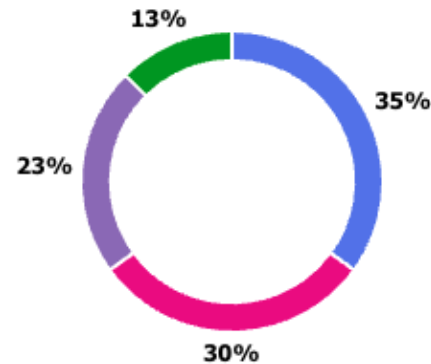
Is your organization public or private?

Public	17
Private	16
Other	7



Operational and commercial model

Commercial	14
Public funding	12
Grant	0
Mixed (public and private funding)	9
Other	5



- The organisation of the multimodal service was almost as often private (16) as public (17).
- The funding was also almost as often public funding (12) than commercial (14).

The capabilities of the services

- Most of the services were reported to contain multimodal route planning – no surprises there: Fully: 82,5% of the services, Partially: 7,5% of the services, from total of 40 services.
- The next most often mentioned capabilities:
 - Purchasing local public transportation tickets: Fully: 35% of the services, partially: 10% of the services
 - Booking and reservation of local public transportation tickets: Fully: 30% of the services, partially: 15% of the services
 - Purchasing tickets to multimodal route at once: Fully 25% of the services, partially 17,5% of the services

● Fully ● Partially ● Not at all ● Not applicable

Multimodal route planning (a journey that combines different transport modes — e.g., train + bus + bike)

Purchasing tickets to Multimodal route at once

Booking and reservation of tickets across country borders

Purchasing tickets across country borders

Booking and reservation of tickets across municipality/state borders (within operating country)

Purchasing tickets across municipality/state borders (within operating country)

Booking and reservation of local public transport tickets

Purchasing local public transport tickets

Booking and reservation of micromobility services (e.g., e-scooters, e-bikes)

Purchasing micromobility services

Booking and reservation of long-distance transportation

Purchasing long-distance transportation

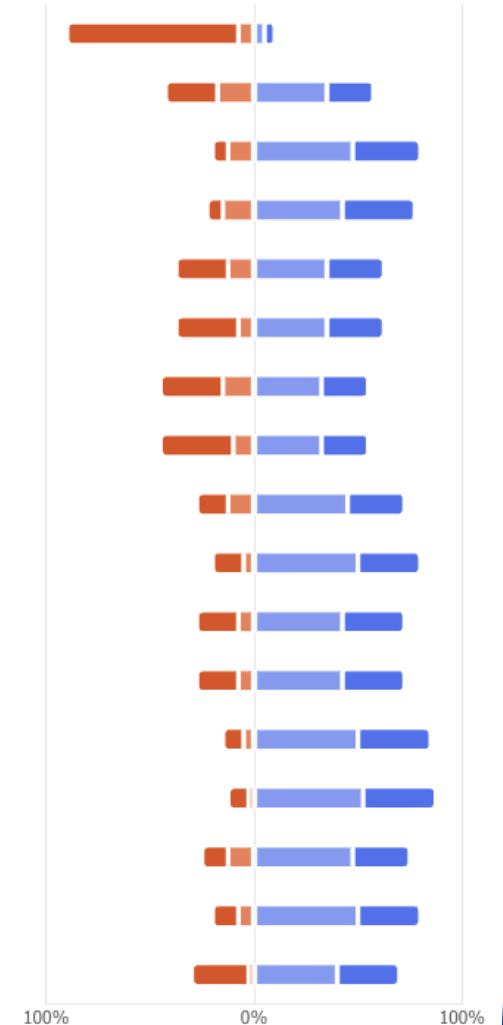
Booking and reservation of taxis

Purchasing taxi services

Booking and reservation of demand responsive transport (DTR)

Purchasing demand responsive transport (DTR)

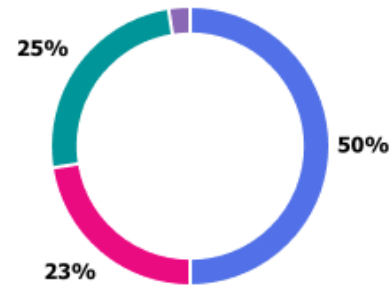
Ticket inspection and validation



Most of the service owners plan to extend multimodal cross-border capabilities

Do you have plans to extend multimodal cross-border capabilities in your service in the near future?

● Yes, activities are in our backlog	20
● Yes, at some point	9
● Not in the near future	10
● I don't know	1

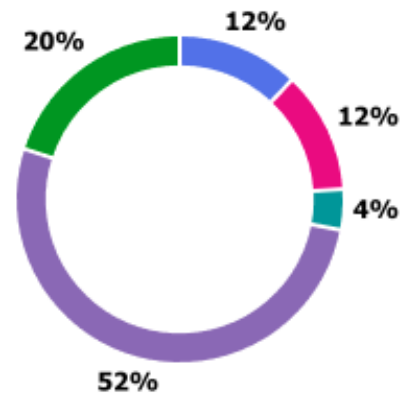


- 50% had activities in their backlog and 23% plan to extend the capabilities at some point.

Booking and payment APIs

Which booking and payment API's your service utilizes?

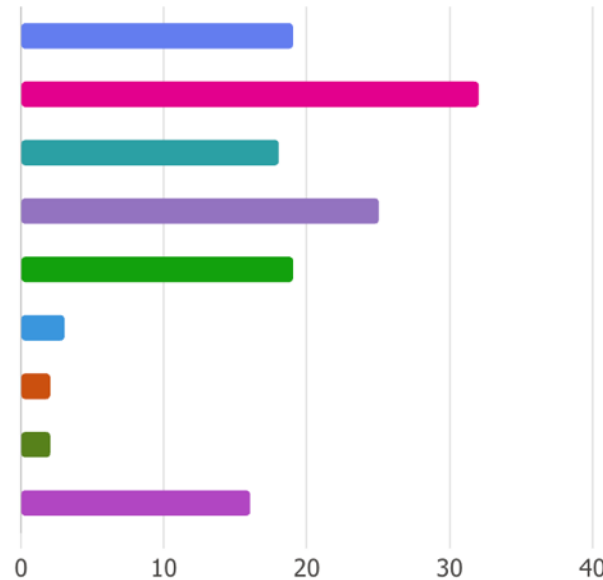
OSDM	6
TOMP-API	6
BoB	2
None	26
Other	10



- Almost half of the service owners reported to use some booking and payment API's (48%), most common were OSDM and TOMP-API (both 12%).

The data standards in use

● NeTEx	19
● GTFS	32
● SIRI	18
● GTFS RT	25
● GBFS	19
● MDS	3
● GOFS	2
● None	2
● Other	16

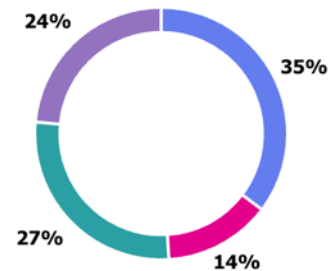


- Most used data standards are:
- GTFS (32 respondents)
- GTFS RT (25 respondents)
- NeTEx and GBFS (19 respondents to both)
- SIRI (18 respondents)

Open-source products

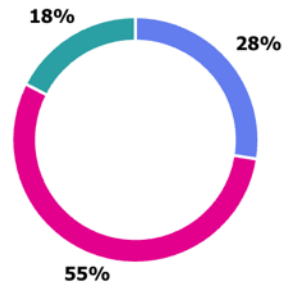
Which of the following or similar travel open-source products does your service utilize?

● OTP	18
● OJP	7
● None	14
● Other	12



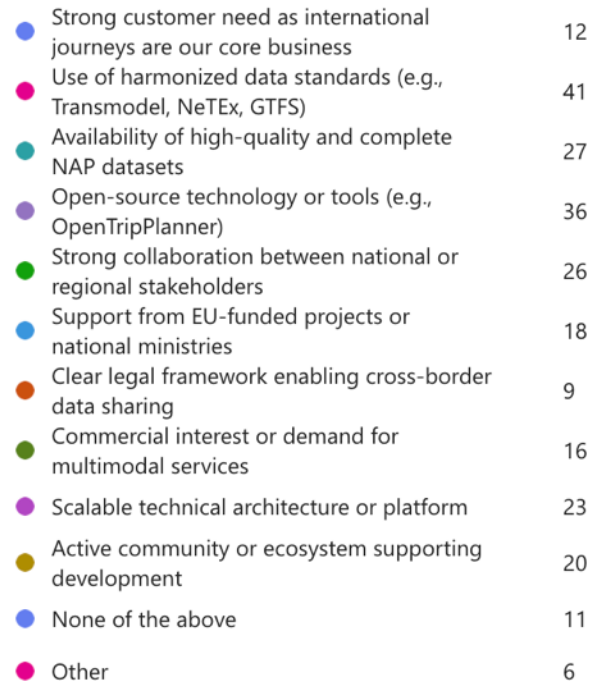
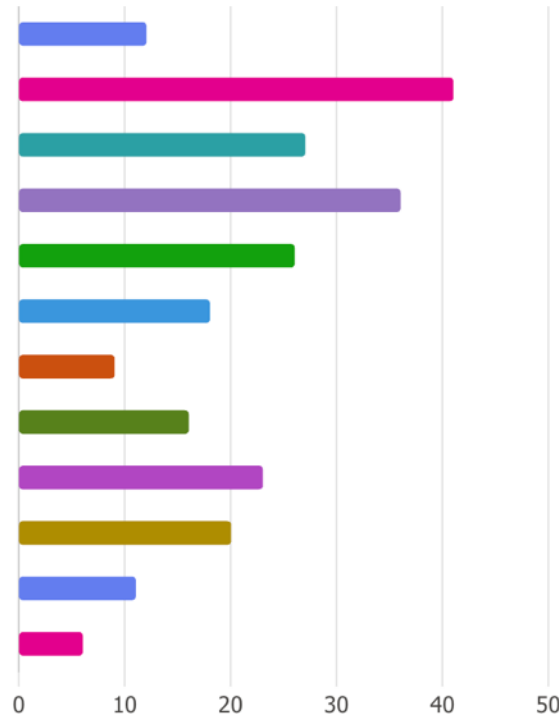
Is your product open source?

● Yes	11
● No	22
● Partly	7



- Most common open-source products were Open Trip Planner (35% of the respondents) and Open Journey Planner (7% of the respondents).
- 28% of the products were itself open source.

The main drivers that have helped to scale services across borders or foster data re-use



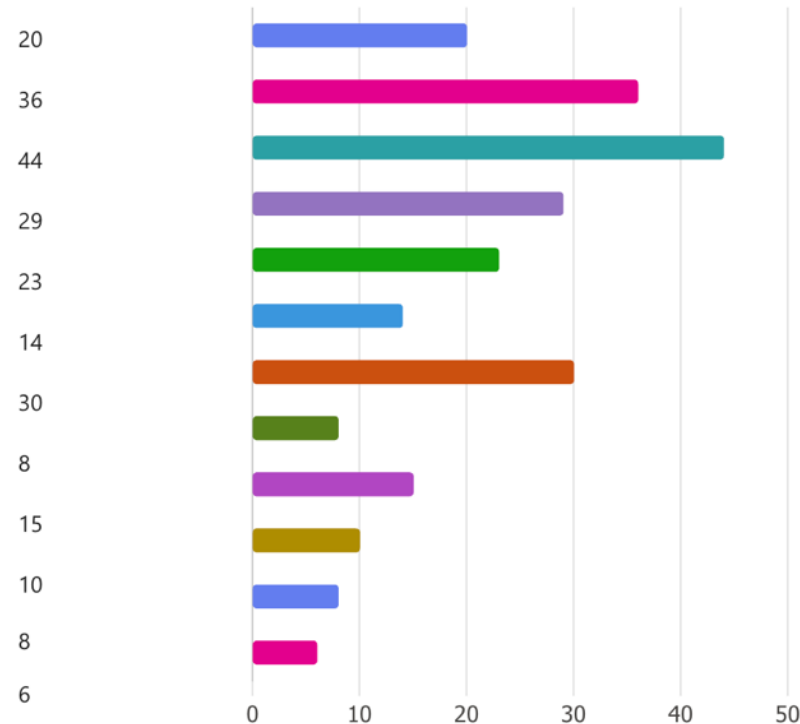
- Main drivers are:
- Use of harmonized data standards (e.g. Transmodel, NeTEx, GTFS) (41 respondents)
- Open-source technology or tools (e.g. OpenTripPlanner) (36 respondents)

The main drivers that have helped to scale services

- **Standards and tools for data, payment etc. were mentioned as supporting factors.**
 - Standards, especially benchmarked technical implementations and solid profiles are key for supporting mobility data-based services
 - Transmodel, GTFS and ticketing standards like BoB gained mentions
 - Organisations like UITP, Smart Ticketing Alliance, Mobility Alliance and projects like deployEMDS were mentioned vital platforms for cooperation
- **In addition, different studies, interest and support from Government or EU or other parties were mentioned.**
- **Organisations own strong will or commercial interest.**
 - “Easily available, high quality and universalized data is the most important thing for us.”
 - “Mostly the commercial interest.”

The main barriers limiting scalability and/or cross-border integration

- Cross-border journeys aren't our core business
- Lack of harmonized data models or standards (e.g., Transmodel, Netex, GTFS)
- Incomplete or poor-quality data e.g. in National Access Points (NAPs)
- Limited interoperability between national systems or platforms
- Licensing restrictions or proprietary data formats
- Low commercial demand or unclear business models
- Fragmented governance or lack of coordination between countries
- Technical limitations in routing engines or integration tools
- Insufficient funding or resources for scaling solutions
- Legal or regulatory barriers to cross-border data sharing
- None of the above
- Other



- Main barrier is Incomplete or poor-quality data e.g. in NAPs (44 respondents)
- The next mentioned barriers are:
 - Lack of Harmonized data models or standards (e.g. Transmodel, NeTEx, GTFS) (36 respondents)
 - Fragmented governance or lack of coordination between countries (30 respondents)
 - Limited interoperability between national systems of platforms (29 respondents)
 - Licensing restrictions or proprietary data formats (23 respondents)

The main barriers limiting scalability and/or cross-border integration open comments

- **The mentioned barriers included that the data breaks down in the border – different data formats in different countries. Different interpretations of NeTEx and other formats.**
 - “Open data usually cut int. lines/trains at border. Merging them back together is major obstacle. Different formats, NeTEx profiles, code lists, interpretation on how to populate data break compatibility.”
 - “Some NAPs publish data not matching European standards, or, if they do, European standards can be used in very different ways, IDs between real-time and static data often do not match; sometimes published datasets don't match data format stated in metadata, and only a few NAPs inform consumers and/or producers about such a mismatch”
 - “Particular railway (infrastructure) operators tend to publish data that is cut off at the end of their network. This is often hard or impossible to merge again.”
 - “NeTEx and SIRI are not equal across EU making it difficult to scale solutions.”

Key results and recommendations

Recommendations for improvements of NAP data re-use

From challenges to strengths

NAP Situation and NAP data re-use in Europe

- The challenge is not only in NAP availability but in how travel information service data is accessed, validated, converted, and reused. Even where NAPs exist, operators face legal, semantic, and governance bottlenecks that limit practical re-use. The NAP NeTEx data is different in each country meaning the data “breaks” in the border.
- In some cases, every dataset still requires bilateral agreements and custom onboarding. The organization previously provided some of its own data to NAP, for example for specific geographical areas; however, this data is no longer provided, as the data link was closed following a denial-of-service attack. Open-source data providers such as OpenStreetMap were widely used due to their availability and trusted data quality, especially outside urban areas.
- Even when data is published, the re-use is undermined by inconsistent GTFS variations, different NeTEx interpretations, and organizational reluctance to share rich datasets. However, biggest obstacle is still the unwillingness to even open any travel data: *“The bottom-up process <is the most important>, I say companies understand that opening, complying with the standard and so on.”*
- In the German–French border region, the opening of French data improved availability, but operators still struggle with incompatible semantics, differing dataset granularity, and sometimes non-frequent update cycles. In addition, if the system provider can only accept GTFS, the NeTEx data is useless if it is not convertible to GTFS format.

Barriers and Challenges of NAP data use and re-use

- Data re-use operators described that, for them, directly usable URLs are the most accessible way to re-use travel data. For example, metadata-only NAPs, contractual and licensing constraints, and overall organizational resistance to opening data all hinder effective data re-use.
 - Even when data is available, inconsistent standards and divergent national NeTEx profiles create incompatible formats. Although GTFS is more widely adopted and easier to validate, it is not faultless either, as service and route identifiers often change at national borders.
- Several regions still publish fragmented, outdated or uneven datasets, with mismatched identifiers and differing update cycles, which means cross-border integration needs additional work. Some companies strip the data meaning they use themselves richer dataset that contains more information but offer to NAP openly data without some information. Sometimes the dataset is even missing completely or updated several years ago.
- A lack of neutral validation tools, stable identifiers, and coordinated governance further complicates data re-use, forcing organizations to invest in manual corrections, conversions, and contract negotiations. Taken together, these barriers show that data re-use in Europe is constrained more by legal, organizational, and semantic inconsistencies than by the availability of NAPs or standards alone.

Recommendations for improvements of NAP data re-use

Results of the survey and interviews of data re-users in Europe.

- Improving NAP data re-use would require an unambiguous recommended NeTEx profile. The standard would need to be implemented consistently across all regions so that it is fully machine-readable and enables the use of common validation tools
- Supporting a cultural shift toward the understanding that open data can increase ridership is important.
- There is currently a need for support in creating licensing agreements between parties, for example through ready-made templates. However, if the data were opened through national legislation, these licensing agreements would no longer be necessary, although they may still be useful during a transition period.
- There is also a need for support for open-source tools, or for NAPCORE to offer tools directly to service providers. There is demand for both validation tools and, in some cases, even for a unified service or reference implementation. Such a unified service or reference implementation would not need to be built from scratch, instead, there is a possibility to use or replicate an existing, well-functioning system from one Member State.



THE CHALLENGES & BARRIERS

Beyond Access: Legal & Governance Bottlenecks

Operators face **legal, semantic, and governance bottlenecks**.
Re-use often still requires **bilateral agreements** and custom onboarding.



The “Border Break”

- Data “breaks” at borders due to incompatible national NeTeX profiles
- Inconsistent GTFS, and
- Varied update cycles (e.g. German–French border)



Data Quality & Fragmentation

- Fragmented, outdated, or uneven datasets, mismatched identifiers, and even missing data.
- Open-source data (e.g. OpenStreetMap) is often preferred outside urban areas due to trust.



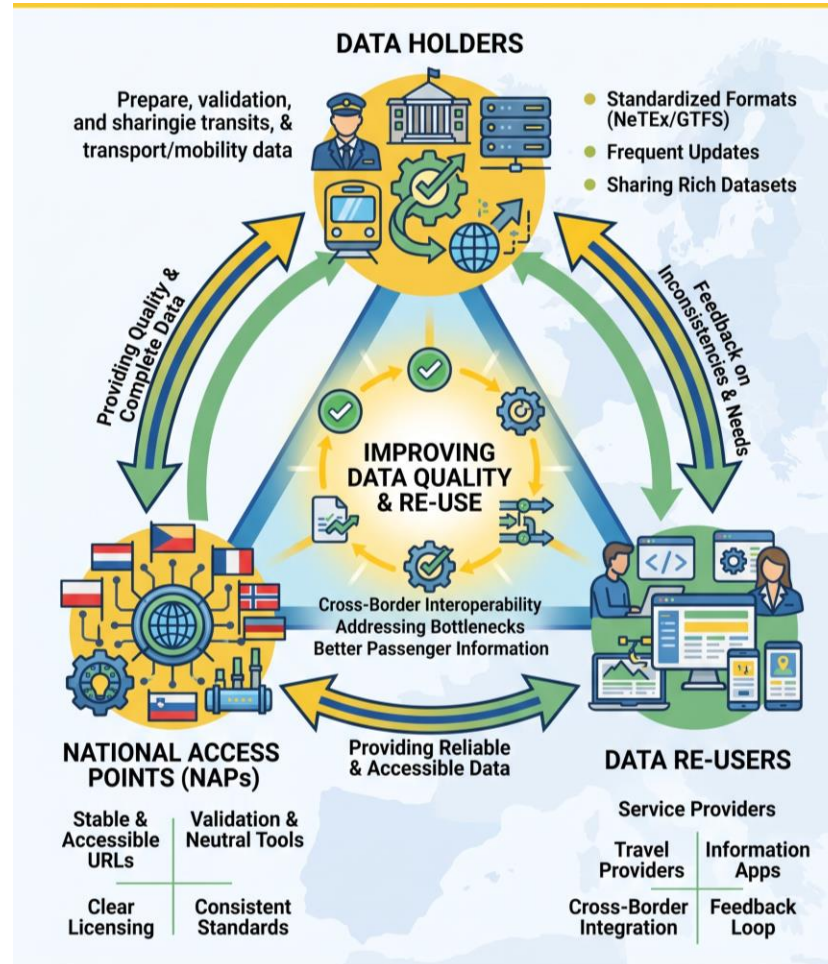
Reluctance to Open Data

- Organizational hesitation.
- Closed data links (such as after DDoS attacks).
- “bottom-up” challenge of convincing operators to share rich datasets.



MOBILITY DATA & NATIONAL ACCESS POINTS (NAPs) IN THE EU

Key Survey Findings on Data Re-use Challenges & Solutions



Visualisation with Gemini AI

The Goal: Scalable Cross-Border Re-Use

- Reduce Fragmentation
- Lower the Burden on Smaller Actors
- Scalable Cross-Border Re-use



THE WAY FORWARD & SOLUTIONS

Standardization & Unified NeTeX Profile

A consistently implemented, unambiguous NeTeX profile to enable machine-readability and common validation tools across all EU regions.



Streamlining Legal & Licensing Obstacles

- Support for ready-made licensing templates or, ideally,
- Ideally, opening data via national legislation to eliminate bilateral needs.



Promoting Open-Source & Collaborative Tools

- **NAPCORE** and tools directly for service providers.
- such as validation tools, e.g. collaboration tools, or tools, shared reference implementations,
- replicating successful system data from other Member States.



Coordinated Governance & FAQs

- Established processes, guidelines, best practices, and FAQs to maintain, operate, and keep datasets up to date.



Executive Summary: Recommendations from the NAP Data Re-users' Perspective

- **Unified data model:** Remove national NeTex & SIRI profile differences through one EU-level interpretation and one recommended profile.
- **Stable identifiers & harmonized update cycles:** Avoid re-mapping, broken links, and regional inconsistencies.
- **Direct access to data:** Data re-users prefer direct access to download-ready, reusable datasets.
- **NAPCORE / community-based validation system and supporting tools:** NAPCORE common validator for data, supporting data submission, validation, and ongoing monitoring of data quality.
- **Single API per country, or ideally a shared EU endpoint or reference implementation:** Simplify access and cross-border re-use by offering a common implementation that countries can adopt.
- **Shared templates and guidance:** Reduce legal friction and negotiation overhead through shared guidance and FAQs, including licensing templates, NeTex profiles, and clear guidance on how to act if a provider breaches the FRAND principle.
- **Authority + mandate:** Tools alone are not enough; NAPCORE-style governance and a clear mandate are needed to ensure consistent adoption.

Thank you!

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