



# MOBITTA

## POSITION PAPER

Smart and Connected Open Mobility Data in  
Balkans

### ABSTRACT

Mobility is evolving with the implementation of intelligent transportation technologies. Yet, its implementation is fragmented or even non-existent in the Balkans. MOBITTA was created to address this and assist Public Transport operators, logistics operators, governments and cities to create connected, safe, interoperable and sustainable transit services.

MOBITTA Team

MOBITTA was created by a passionate team of young individuals/transportation experts that wanted to address the issue of non-interoperable and non-connected transit services that impact on the safety and sustainability of the transportation system. MOBITTA believes that all the above can be achieved through Open Mobility Data.

To the memory of the 57 persons who lost their lives on a Rail accident in Greece on the 1<sup>st</sup> of March 2023 in Greece. May this initiative contribute to eliminating similar accidents and increasing passengers that use sustainable modes of transport.

MOBITTA

Version 1.0

Date: 11/03/2023

## Smart Mobility

Transportation is a critical component for achieving our society's goals for a sustainable future. For many decades the United Nations, European Union and governments around the world are discussing and elevating the necessity of increasing sustainable travel means being connected, safe, interoperable and sustainable transport systems. Current ambitions on the Balkans' level towards such a transportation system, will require redefinition to address local state-of-play concerns.

Three strong trends have started to drive transportation development: **automatization**, **“servitisation”** and **electrification**. These trends are fundamentally shifting the way we consume mobility. Transportation is now more than the transportation of people and goods, it is an information service as well, making traffic of information almost as important as the traffic of vehicles. Within this context, Public Transport, logistics, micro-mobility modes and even private cars need to adapt to a business environment centred around **seamless mobility**.

To achieve seamless mobility, a set of technological and non-technological enablers should be considered by transport service providers. On the one hand, technology enablers are digital and physical-digital tools that can achieve functions in an automated way, achieving safety and efficiency. Technology enablers are innovative, new or established technologies such as cloud services, edge computing, distributed ledger technologies, data standardisation, electronic ticketing. The deployment of and continuous innovation on these technologies in transport systems will create the ideal environment for seamless mobility.

On the other hand, non-technology enablers can assist the modernisation of organisations and procedural automation required for tackling more business scenarios. Such non-technology enablers are emissions reduction, data sovereignty, inclusive transportation systems, frictional-integrated travel, data visibility, regulatory compliance. Given technological progression, non-technological enablers seem following the new capabilities provided by technology yet, business decisions are motivated mostly by non-technological enablers.

Viewing transportation as a whole, new ecosystems are being shaped, while collaborations based on data and digital services are interweaving. As the industry of mobility is being revolutionised, we need to align Mobility in the Balkans with these new contexts to make it a part of future mobility.

## Scope and overarching objectives of MOBITTA

MOBITTA aims to provide Transport Service Providers and other mobility stakeholders with the organisational tools necessary for them to foster technology and non-technology enablers within their organisations.

**Creating opportunities for innovation in the Balkans:** We want to lower the barriers for entering the market and expedite the process of launching mobility services to residents in our countries. In this way, we aim to enable the Balkans as a living lab for new innovative mobility services.

A critical step in lowering current barriers is to simplify the onboarding process to open mobility data. We believe that harmonised data delivery throughout the Balkans will increase the deployment of services to the targeted user base and lay the groundwork for an attractive market.

**Working together in the Balkans:** To accelerate mobility innovation, the EU is currently implementing new regulations to expedite and harmonize available mobility data. In the Balkans, we welcome these regulations. We aim to use them as a driver in our work towards a first – class innovator experience in the mobility area. Also, by working together, the Balkan countries can articulate a firm joint voice in policy development at the European level.

Apart from harmonization of data and joint policy work, we see substantial benefits from sharing technical solutions, avoiding unnecessary duplication of work and re-using best practices. In the years to come, we will strengthen our partnerships on these topics.

## The need for a Balkans approach

Actors in the ecosystem of smart mobility act on a global level. They attract customers from around the world for various trip purposes which expect an as-uniform-as-possible level of service. In addition, within the Balkans context all countries strive for a wide collaboration and abolishment of hindrances for people and goods movements, respecting national legislations. The future of mobility in Balkans is defined in the context of large user bases and regions that can offer relevant digital cooperation to achieve seamless mobility.

However, in this regard, the Balkans remain fragmented. Balkan countries are doing small steps or no steps at all towards integrating new transportation trends and engaging innovative solutions. Additional complexity can be found on the ununified efforts of same sector Operators, e.g., Mass Transit providers, Logistics providers, Road operators.

We are at the start of the implementation of sustainable, digitized, and integrated Transportation; **now is the time to invest on a comprehensive and bold Balkans offer.** By engaging and discussing about all modes of transport (Public Transport, Micro-mobility, private cars, Mobility-as-a-Service and logistics) and with relevant data offerings and new possibilities for cooperation, we can shape the Balkans into an attractive and leading region for future mobility services and operations.

## Mass Transportation is the key

Public transport is a key element in the conundrum of passenger transportation in the Balkans. However, by leveraging new digital solutions and connecting to innovative mobility services to all modes of transport we can further increase the market share for sustainable mobility.

On the other hand, Balkans can become a logistical node to Europe, transporting goods from Greece and Turkey towards central European countries which can lead to significant economical benefits for the countries in the Balkans. To that end, train transportation in combination with other modes should be central to logistics' advancement in the Balkans.

For the above to happen in the Balkans, a solid base of open high-quality data that can expedite cooperation with new actors is needed, creating innovative offerings for mobility. Our main focus will be Public Transport as the most sustainable and inclusive mobility option, although MOBITTA approach will touch all modes of transport.

## EU approach and regulations

EU already proposed a [European Strategy of Data](#) that aims to establish a Digital Single Market which complies with the targets of MOBITTA. The Strategy relies on a set of complementary actions:

- Setting clear and fair rules on data access, use and governance across sectors;
- Investing in next-generation tools and infrastructures to store and process data;
- Joining forces to build a European federated cloud capacity;
- Deploying common and interoperable data spaces in key sectors to help pool, share and re-use data;
- Developing competences by investing in digital skills, data literacy and capacity building in SMEs.

There are already established EU regulations that are referring specifically to mobility data:

- Interoperable EU-wide emergency call or eCall (305/2013);
- Road safety-related minimum universal traffic information free of charge to users (886/2013);
- EU-wide real-time traffic information services (2015/962);
- EU-wide multimodal travel information service (2017/1926);
- EU Open Data and re-use of Public Sector information Directive (2019/1024);
- S.I. No. 376/2021 - European Union (Open Data and Re-use of Public Sector Information) Regulations 2021.

The idea of the last four Delegated Regulations is to develop specifications to be followed in order to ensure the compatibility and interoperability among different systems and to provide all the information so that they are accurate and viable across borders. They indicate how to ensure a correct formal communication among member states and how to develop National Access Points (NAP). NAPs are a mechanism for accessing, exchanging and reusing transport related data under Delegated Acts of the ITS Directive (2010/40/EU): they constitute “a single point of access for users to at least the static travel and traffic data and historic traffic data of different transport modes, including data updates, provided by the transport authorities, transport operators, infrastructure managers or transport on demand service providers within the territory of a given Member State”. Every country has its own NAP.

## Focus areas for cooperation

In this paper, we signal our joint ambitions to actors involved in the creation of smart mobility services. We do so by highlighting six prioritised areas for strengthened cooperation within each country and within the Balkans:

1. Open Data;
2. Open Standards;
3. Data governance and sovereignty;
4. Implementation of EU regulations;
5. Living Labs;
6. Cross domain data sharing.

In terms of establishing a digital infrastructure, we argue that these areas are the ones most relevant to create a vibrant Balkan ecosystem in the field of future mobility. By tackling these areas, we have the opportunity to establish a world-leading region in smart mobility.

The focus areas support the Balkan approach to smart mobility by creating opportunities for cooperation, pushing openness and thereby enabling the Balkans as a living lab for new innovative mobility services.

In each area, we describe the desired position for the Balkans, current challenges and necessary actions to reach the desired position. We will start to address these necessary actions in MOBITTA.

## Focus area 1: Open Data

We need to create and maintain a common baseline of datasets and services, as it provides the foundation of communication between various stakeholders in the mobility industry and it fosters innovation. In that way, Balkans can become a market of innovative and transformative solutions for mobility.

Externally driven harmonisation efforts like GTFS exports, NeTEx standard and EU regulations have so far been instrumental in opening up mobility data in Europe for mass transit. The Balkans have fallen off the train of innovation by not taking advantage of existing tools towards the open data trend.



### Existing challenges

- There is a lack of structure for national and cross-border data, constraining services operating across operators in the same country but also cross-border;
- Data is language-dependent, e.g. disturbance information is only given in the local language;
- There are different definitions of key public transport constructs across the Balkans;
- The Balkan countries have differing preconditions or even non condition to support several standards.





## Desired position of Balkans

- The following datasets should be available in all Balkan countries:

### Strategic Data

- Stops and stations;
- Routes and schedules;
- Travel planning services;
- Fare information and rules;
- Ticket sales services.

### Real Time Data

- Automated Vehicle Locations;
- Incidents data;
- Accessibility (PRM) data;
- Crowding and congestion data.

- Data need to be language-independent;
- We want aggregated data feeds per country to minimize administrative work for third-party developers;
- Open data (and open source) create fewer dependencies to commercial software houses and allows for market-responsive development;
- Open data will allow services to roam throughout the Balkans.



## Actions to be considered

- In-depth analysis of:
  - i. inconsistencies regarding existing data and services
  - ii. cross-border issues across the Nordics
  - iii. language dependencies in data delivery.
- Create and sign an action plan between Balkans stakeholders to harmonise data and services across operators in Balkans, for people and goods transport and across modalities;
- Involve Governments to create directives and regulations for harmonization of data and to provide infrastructure for data sharing such as the National Access Points;
- Establish a Balkans Open Data Barometer in <https://opendatabarometer.org/>.

## Focus area 2: Open Standards

We need commonly agreed standards and formats to publish, share and exchange data consistently across operators in the Balkans and beyond. Standards provide a common understanding that streamlines implementation of services.

Standards serve as a powerful tool to unlock mobility ecosystems around the globe. Standards are needed for scheduled and real-time data, travel planning, demand-responsive traffic and, in the near future, ticket sales services.



### Existing challenges

- Mobility stakeholders are either invested in different standards (e.g., Public Transport, Road operators) or are not implementing standards (e.g., Logistics, micro-mobility providers);
- There are very few published datasets in the Balkans while operators implement different content and interpretation of the standards;
- Currently, there is a lack of consensus around metadata standards;
- Countries are facing different challenges at the regulation aspect making policy and regulation fragmented;
- There is no central or governmental organization to set a unified way to publish data based on EU directives or national directives.



## Desired position of Balkans

- NeTEx and SIRI data should be published based on a common Balkan profile. In addition, we should work towards having Transmodel standards as the de facto standards for data exchange within the Balkan industry.
- Harmonised creation of GTFS, SIRI (including SIRI-lite), GTFS-RT, Datex II, INSPIRE using a common interpretation of the standards.
- Develop and implement standards for logistics to enhance the industry in the Balkans making it a logistical node between Europe, Asia and Africa.
- DCAT-AP should be used as a standard for metadata at National Access Points.
- Standardizing ticket sales services is a promising but still emerging area. In the short term, the Balkans should share knowledge in the area. The longer-term goal is to harmonize services for ticket-sales across the Balkans and beyond allow ticket sales by third parties.



## Actions to be considered

- Joint interpretation, design, and implementation of a Balkans NeTEx, SIRI, Datex II profiles;
- Creation of a knowledge base for GTFS, Transmodel, INSPIRE, Datex II standards;
- Define the role of SIRI, GTFS-RT and Datex II in the cross-Balkans and EU mobility landscape;
- Emerging standards (such as Linked Open Data) should be continually monitored and assessed;
- Use open route planners (e.g., Open Trip Planner, GraphHopper) as an interface standard for travel planning services based on Open Journey Planner standard.
- Use DCAT-AP as a standard for metadata at national access points.

## Focus area 3: Data governance and security

We need data governance policies to control the security, access, (re-)use, enrichment of data in a universal and comprehensive way in line with the [FAIR principles](#) to pave the way for harmonized services, such as, Single Ticketing.

This focus area will unlock the benefits of other focus areas, especially open data and standards as it will allow define the necessary conditions, obligations and rights of collaborating bodies that share data. Through permissive and harmonized licenses and terms, we will create sufficient room for innovation throughout the Balkans and minimize the legislative burden for innovators.



### Existing challenges

- National legislation either does not exist or does not require prescription of data license publication, for public or commercial companies;
- Terms for access are dependent on the respective country's underlying IT architecture;
- Terms for ticket sales must meet several unresolved challenges. For instance, who is allowed to sell tickets, what profit margin/kick-back will be paid to resellers, and what price can be offered to the traveller?
- Privacy concerns are used as an argument to not open up data.



## Desired position of Balkans

- A general data governance profile should be shared and create distinct terms and licenses for data sharing;
- Data should be shared under a standard license for maximum re-use;
- Terms for access should be harmonized so that services can be deployed across the Balkans;
- Terms for ticket sales is a promising but still emerging area subject to national constraints. However, the contents of such terms should be discussed, and knowledge of good and bad experiences should be shared;
- Established standards and practices for how to handle privacy concerns when opening up data;



## Actions to be considered

- Create national data governance policies that will specify the way data can be shared, used, exploited. Data governance will ensure data is secure, private, accurate, available, and usable. It includes the actions people must take, the processes they must follow, and the technology that supports them throughout the data life cycle.
- Identify and harmonise the most important common terms related to the provision of real-time data and services, compelling development of cross-Balkan services. If possible, such terms should be compliant with applicable standards, be machine-readable and aligned with the open API definition.
- Identify the most important common terms related to the provision of ticket sales for cross-Balkan services.
- Visualize and communicate the current Balkan landscape of licenses.
- Monitor, contribute and collaborate with established cyber security practices regarding privacy concerns.

## Focus area 4: Implementation of EU regulations

We need to implement EU Regulations 2017/1926, 320/2021 in a way that increases the attractiveness of the Balkans mobility market.

The European Commission has gone to great lengths to harmonize European mobility data. Starting in December 2019, member states must establish national access points for open travel and traffic data. In addition, all member states must publish designated mobility data categories in prescribed formats to support the provision of EU-wide multimodal travel information services. EU is moving towards a common data space. A preparatory action has been launched to map existing initiatives and identify potential common building blocks. A deployment action will then help make large amounts of data in machine-readable format available, with a focus on urban mobility. Moreover, the Connecting Europe Facility (CEF) programme is supporting a coordination mechanism to federate National Access Points. We seek to leverage these far-reaching regulations and acts to increase the attractiveness of the Balkan mobility market.



### Existing challenges

- Limited awareness or extended knowledge of the EU regulation and the work to be done in the transportation industry;
- Difficulties for the Balkan countries to individually push policies on an EU level;
- Each country in the Balkans has a different regulatory approach without any indication or interest to commonly converge;
- Deciding on precise usage of NeTEx and SIRI that some countries do not even use or know yet.



## Desired position of Balkans

- Data policies and instructions will be designed based on EU directives and best practices;
- The Balkans approach will be compatible with the EU regulation and will open up the Balkans as a market for smart mobility services, being fully harmonized with the EU;
- The Balkan countries will have a shared understanding and interpretation of regulated data categories;
- Knowledge should be shared on the design and use of national access points;
- The Balkans will be synchronised on future policy issues and, where applicable, have a unified voice in such work;
- Data released under NeTEx and SIRI will be done under a common profile.



## Actions to be considered

- Together with other initiatives, address the treatment of datasets beyond the scheduled transport modes (bike sharing, car sharing and other demand-responsive modes);
- A common interpretation of the regulation and common decisions on ambition level for dynamic data;
- Make contributions to responsible authorities around rationales, design alternatives and ways to cooperate for national access points;
- Contribute to a unified Balkans position and voice in the development of upcoming EU regulations and standardization.

## Focus area 5: Living Labs

We need to understand data users' needs as well as have fruitful developer relations to build a vibrant Balkan ecosystem of mobility services. We should focus on co-design, co-development and co-experimentation with data to foster innovation and common problem solving.

This depends on our capability to facilitate the work practices of external developers and to build reciprocal relationships. The creation and maintenance of Living Lab programs is the key for these relationships. Living Labs is an open innovation system that facilitates communication and collaboration between all interested stakeholders that share or need mobility data.



### Existing challenges

- Services in the Balkans are not plug-&-play or well-documented increasing development time and problems with understanding.
- Very few digital services to be used as building blocks for 3<sup>rd</sup> party developers;
- Current support functions do not allow for scaling in a resource- efficient way;
- No coherent overview is available for open mobility data in the Balkans;
- There are no tools easing development of mobility services for the Balkans as a region.





## Desired position of Balkans

- Scaling from one Balkan country to another or to the entire Balkans should be seamless for 3<sup>rd</sup> party developers and stakeholders;
- 3<sup>rd</sup> party developers with an interest in cross-Balkan service development should be able to get an overview of what data are available in each country, the available data's quality, and the actor who is making them available;
- Continuous creation of conditions that foster conversations between different stakeholders-developers, governments, public transport operators, third party companies;
- Published examples, libraries and other support tools, enabling cross-Balkan service development, should be available;
- Best practices regarding university engagements and collaboration with companies, developers and other authorities should be common in the Balkans.



## Actions to be considered

- Analysis, design, and development of necessary support tools to build Living Labs;
- MOBITTA should offer Living Labs moderation and growth and promote the created Living Labs across the Balkans;
- Foster continuous conversation and innovation through the Living Labs;
- Organise innovation contests to boost Balkans mobility service development;
- Collect and share best practices for developer onboarding, documentation, and scalable support functions;
- Define and disseminate in the Balkans best practices for university engagements and collaboration using best practices from the rest of the world.

## Focus area 6: Cross domain data sharing

We need a higher degree of agility, a faster time to market and opportunities to co-create with external actors. Mobility is an economy that connects different markets and domains, thus, having virtually infinite capabilities to innovate when considering cross-domain opportunities.

Cross domain data sharing can multiply the value of data for citizens and companies. Transport data should be open to use in other industries for transparency and to promote better services (e.g., better estimations, security services). The transparency of source code also drives more secure solutions and fosters a culture of reciprocity through shared risk and work effort.



### Existing challenges

- There is no clear data format for different data of various industries;
- Documentation of most common standards and open data portals is either overly complicated or underdeveloped;
- There are no cross-industry standards for harmonised data exchange;
- There is no catalogue of potential valuable data sets in each industry.



## Desired position of Balkans

- Data sharing and harmonized data formats should be extended to other industry's data;
- Data governance, including Living Labs paradigm, can be a hands-on cross-domain collaboration point and/or a lighthouse for other industries;
- Cross domain data sharing in the Balkans can be the initiator for the creation of common, safe data spaces for EU countries;
- Conditions that foster conversations between different domains should be continuous.



## Actions to be considered

- Extension of Living Labs participation to other industries;
- Living Labs of MOBITTA should allow discussions acting as a forum for data sharing and usability;
- Initiation of discussions for cross-domain data sharing should be executed at different levels, from policy to technical;
- MOBITTA should contribute to the data standards harmonisation efforts of EU.

## From Vision to Action

The new landscape of actors and disruptive offerings within the area of smart mobility creates opportunities to tackle current challenges in the transport sector.

In this setting, the Balkan countries can strive to become a leading region for future mobility services. Balkans can be the starting point for unified transport services connecting three continents. The six prioritized focus areas of MOBITTA will give the move towards that.

MOBITTA will be a joint force between various stakeholders from each Balkan country that believes in the vision of Open Mobility data. All partners will contribute in any of the Six focus areas and work on the action points that are subject to change and evolve.