

## **SMARTMOBAIR project**

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## Table of Contents

Executive Summary .....	5
0. Introduction .....	6
1. Methodology.....	7
1.1 Questionnaire design .....	7
1.2 Data collection .....	8
2. Analysis of Smart Mobility Deployment Questionnaire Responses .....	9
2.1 General information and Territorial Data .....	9
2.2. Traffic Data .....	11
2.2.1 Overview of Modal Shift in Transportation .....	11
2.2.2 Traffic Congestion Levels .....	11
2.2.3 Peak Traffic Hours .....	12
2.2.4 Real-Time Traffic Monitoring.....	12
2.2.5 Public Transportation Systems .....	12
2.2.6 Initiatives for Optimizing Public Transportation.....	12
2.2.7 Parking Availability and Monitoring.....	12
2.2.8 Key Observations .....	13
2.3 Mobility Data Availability .....	13
2.4 Data Usage and Analysis .....	14
2.4.1 Current Uses of Mobility Data .....	14
2.4.2 Tools and Software for Data Analysis.....	14
2.4.3 Data Gaps and Limitations.....	14
2.4.4 Suggested Improvements .....	14
2.4.5 Key Insights .....	15
2.5. Urban Mobility Problems .....	15
2.5.1 Existence of Sustainable Urban Mobility Plans (SUMPs).....	15
2.5.2 Main Urban Mobility Problems .....	15
2.5.3 Impact on People.....	16
2.5.4 Key Recommendations .....	16
2.6 Smart Mobility Readiness .....	16
2.6.1 Digital Infrastructure Availability .....	16
2.6.2 Existing Smart Mobility Initiatives .....	17

2.6.3 Stakeholder Collaboration ..... 17

2.7 Barriers and Drivers to Smart Mobility ..... 17

    2.7.1 Identified Barriers ..... 17

    2.7.2 Key Drivers ..... 18

2.8 Future of Smart Mobility ..... 18

    2.8.1 Expected Timelines for Implementation ..... 18

    2.8.2 Suggested Incentives for Accelerating Adoption ..... 18

3. Conclusions ..... 19

Annex 1 ..... 20

References and resources..... 39

## List of abbreviations and terms

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ITS	Intelligent Transport Systems
SUMP	Sustainable Urban Mobility Plan
GIS	Geographic Information System
EU	European Union
IoT	Internet of Things
GPS	Global Positioning System

## Executive Summary

The deliverable *D1.1.2 Report on availability of mobility-related data and problems in pilot territories* is a key component of the SMARTMOBAIR project, aimed at understanding the current state of mobility data and identifying barriers to its effective use, ultimately aiding in the deployment of smart mobility solutions and Intelligent Transport Systems (ITS) within the AI Region. This deliverable aligns with **Activity A.1.1**, which focuses on alignment of knowledge and assessment of territorial readiness to uptake and upscale joint smart mobility solutions.

Having a clear view from the 6 partners of the project, aims at enhancing cross-border coordination and harmonization to remove smart mobility related barriers in the Adriatic-Ionian region, setting up a proactive and participative approach in addressing smart mobility barriers and drivers with the final aim of increasing territorial capacity and readiness to plan, deploy and upscale joint smart mobility solutions according to territorial needs and peculiarities.

## 0. Introduction

The rapid growth of urbanization and increasing transportation demands have made mobility a central component of sustainable urban development. Cities worldwide are working to address pressing challenges such as traffic congestion, inefficiencies in public transport, and environmental impacts. To do so effectively, access to high-quality, mobility-related data has become indispensable for evidence-based planning, policy development, and the deployment of Intelligent Transportation Systems (ITS).

This report, developed as part of Activity A1.1 of the SMARTMOBAIR project, focuses on assessing the availability of mobility-related data across six pilot territories. By analyzing key data types—such as traffic flow, public transit usage, and geographic characteristics—the report provides a comprehensive view of the current data landscape, offering practical insights for enhancing regional mobility strategies without addressing barriers or implementation challenges.

The European Commission's *Urban Mobility Framework* and the CIVITAS initiative highlight the pivotal role of mobility data in driving sustainable transport systems. The *Urban Mobility Framework* emphasizes the need for integrated, data-driven strategies to address congestion, reduce emissions, and promote safe and accessible transport options for all citizens. Similarly, the CIVITAS initiative supports cities in developing sustainable urban mobility through collaborative learning and data-informed solutions, showcasing the transformative potential of leveraging reliable data in mobility planning.

In line with these initiatives, this report stresses the importance of data availability as a foundational element for designing tailored mobility solutions. The Sustainable Urban Mobility Plan (SUMP) Guidelines further reinforce this approach by promoting comprehensive data collection on traffic patterns, modal shifts, and pedestrian and cyclist activity. The European Data Strategy complements these efforts by advocating for improved data sharing and interoperability, enabling cities and regions to collaborate effectively and develop scalable solutions.

By examining the current state of mobility-related data within the six pilot territories, this report provides a snapshot of the available data. The findings are intended to help regional stakeholders better understand how available data can support the uptake of ITS solutions and contribute to the overall objective of improving cross-border coordination in the Adriatic-Ionian region.

By presenting findings on data availability, gaps, and collection practices, this deliverable aims to serve as a resource for stakeholders involved in planning and managing mobility systems within the Adriatic-Ionian Region.

## 1. Methodology

### 1.1 Questionnaire design

The design of the questionnaire was a critical step in ensuring the collection of relevant and comprehensive data from the six pilot territories. The process focused on aligning the questionnaire's content with the objectives of *Activity 1.1 which aims to assess territorial readiness and data availability for the implementation of smart mobility solutions.*

#### 1.1.1 Types of questions

The questionnaire was designed with a combination of closed, open-ended, and multiple-choice questions to capture both quantitative and qualitative data regarding the pilot territories' mobility systems and readiness for smart mobility solutions. Closed questions, predominantly framed as yes/no provide respondents with the opportunity to give straightforward responses. These questions are useful for collecting baseline data, such as the availability of mobility-related data, the existence of smart mobility initiatives, and the presence of sustainable urban mobility plans.

In addition to these closed questions, several items offer predefined response options, but also include an "Other" option. This flexibility allows respondents to select the most appropriate answer while also accounting for additional factors that may not have been explicitly listed. The inclusion of an "Other" category ensures that the responses are not limited to a set of predetermined choices and captures a broader range of relevant information.

The questionnaire also includes a significant number of open-ended questions, providing respondents with the opportunity to elaborate on specific issues, challenges, and experiences. These questions facilitate the collection of in-depth qualitative data, offering insights into contextual factors and nuances that are not easily captured by predefined response options. This approach is particularly valuable in understanding the local context, as it allows for a more personalized account of challenges and potential solutions.

#### 1.1.2 Structure

The questionnaire was carefully structured to collect comprehensive data relevant to mobility in the pilot territories. It was organized into nine main sections, each addressing specific themes, along with two additional parts: one dedicated to respondent details and another providing space for additional comments or feedback.

The first section, **Respondent Information**, collected basic details about the respondent, including their name, contact details, and the name of the organisation and the pilot territory they represented.

The subsequent section, **Territorial Data**, focused on gathering geographical and administrative information. It included questions on the total area of the pilot territory, its geographic layout, and whether it spans multiple municipalities or districts. Additional questions addressed population density, land-use plans or zoning regulations, and any planned construction or urban expansion projects relevant to mobility.

The third section, **Traffic Data**, focused on transportation patterns and infrastructure. It included questions on the modal shift of transportation, traffic congestion levels, peak hours, and real-time monitoring systems. It also addressed public transport routes, ongoing improvement initiatives, and parking monitoring systems.

The fourth section delves into **Mobility Data Availability**, examining the types of data collected, such as traffic patterns, public transit usage, and pedestrian counts. It also explores the frequency and methods of data collection, as well as the challenges and accessibility of this data.

The following section focuses on **Data Usage and Analysis**, highlighting in which areas is the collected data applied and what tools and software are used for data analysis. It also asks for potential gaps that may hinder comprehensive analysis, and suggestions for improvement in both data collection and analytical processes.

Following this, the sixth section examines the **Urban Mobility Problems** faced in the pilot area. This includes identifying major mobility-related issues, and understanding who is most affected by these issues. It also explores where and when these problems occur, helping to identify the most problematic areas and times.

The seventh section shifts focus to **Smart Mobility Readiness**, exploring existing initiatives and systems in the pilot territory. This section also highlights the digital infrastructure available to support smart mobility and any collaborations with tech providers or research institutes that are helping drive innovation in the field.

Moving forward, in the next section, the focus is on the **Barriers to Smart Mobility Deployment**. It asks to identify key challenges, considering also social, cultural, environmental, and legal barriers that may impede the adoption of smart mobility solutions.

The ninth section highlights the **Drivers of Smart Mobility Solutions**, focusing on the motivations behind adopting these solutions.

Next, the tenth section looks toward the **Future of Smart Mobility**, discussing the expected timeline for the widespread implementation of smart mobility solutions. It also explores the incentives that could accelerate their adoption.

Finally, the report concludes with the **Additional Comments** section, providing an opportunity for respondents to share further insights or suggestions regarding the deployment of smart mobility solutions in the pilot area.

## **1.2 Data collection**

To understand the availability of mobility-related data across the six pilot territories, a structured data collection process was implemented. This process aimed to gather comprehensive and consistent information on various aspects of mobility, including geographic characteristics, traffic patterns, prediction systems, and existing Intelligent Transport Systems (ITS).

### **1.2.1 Tools and Format**

The primary tool for data collection was the Smart Mobility Deployment Questionnaire designed by AIT. Initially created in Excel for internal review and adjustments, the questionnaire was later digitized and shared with participants via *Google Forms* to streamline data submission and improve accessibility. The digital format allowed for ease of use, efficient data collection, and facilitated response tracking.

## 1.2.2 Timeline

The development of the questionnaire was a collaborative effort, beginning with the presentation of a draft version to all project partners during the Kick-off Meeting held in Trieste on October 15th, 2024. This meeting provided an opportunity for initial discussions and feedback on the proposed structure and content. Here it was suggested by the partners using Google Forms as the platform for the questionnaire, because of its ease of use and accessibility for data submission.

To refine the questionnaire further, it was shared with all partners in Excel format on November 8th. This allowed partners to review the questions in detail and provide constructive feedback based on their specific expertise and regional contexts.

Incorporating the feedback received, the questionnaire was finalized and launched in Google Forms on November 18th to facilitate easier submission and data collection. To ensure all partners fully understood the form and its objectives, a 30-minute clarification session was organized on November 21st. During this session, additional suggestions were discussed, leading to minor adjustments in the form's layout and structure.

The initial deadline for submitting responses was set for December 16th. However, given the varying schedules and resource constraints of the pilot territories, the response collection period was extended, and all final submissions were received by January 9th 2025.

## 1.2.3 Participation

The questionnaire was distributed to all partners and was completed and submitted by the representatives from the six institutional partners: The Provincial Transport Company, Municipality of Koper, Municipality of Rethymno, City of Nis, Municipality of Novo Sarajevo and the Regional Council of Shkodra. Each institutional partner filled in a single questionnaire and provided their point of view in the questions where an opinion rather than data is requested.

By the end of the collection period, responses were received from all six pilot territories, providing a diverse and insightful dataset. This dataset forms the foundation of the analysis presented in the deliverable *D1.1.3 Analysis of Drivers and barriers to smart mobility solutions uptake in the Adriatic-Ionian area*.

# 2. Analysis of Smart Mobility Deployment Questionnaire Responses

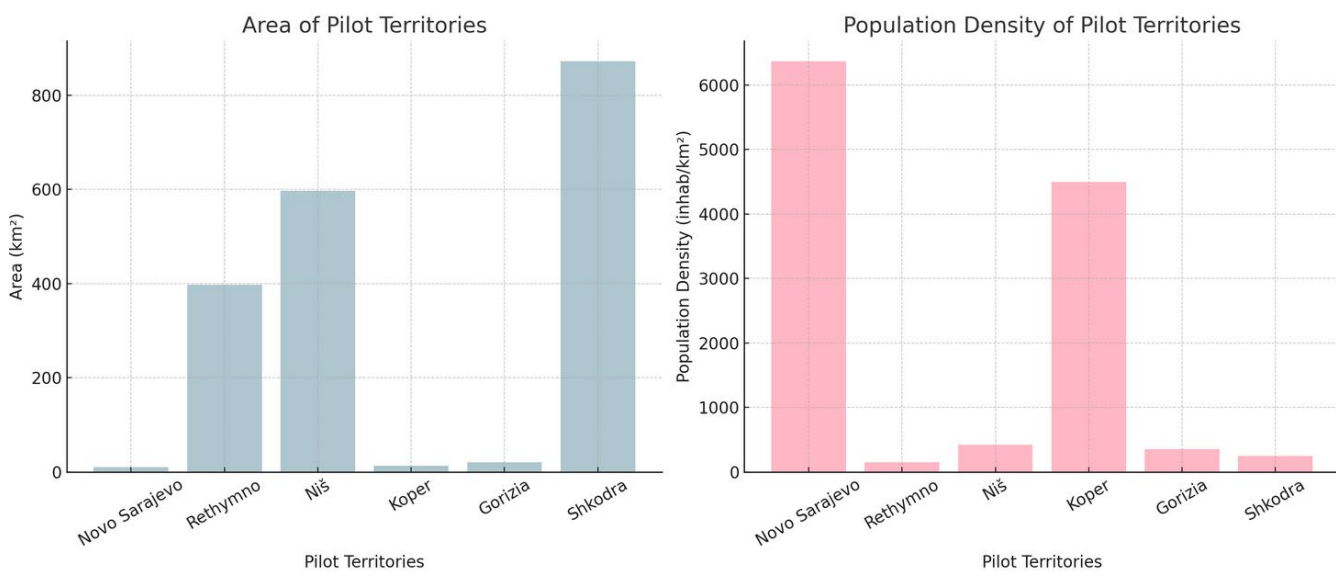
## 2.1 General information and Territorial Data

The six pilot territories—**Novo Sarajevo, Rethymno, Nis, Koper, Gorizia, and Shkodra**—demonstrate a diverse mix of geographic layouts, population densities, and administrative structures, each posing unique mobility challenges.

- **Shkodra**, the largest territory at **872 km<sup>2</sup>**, combines extensive rural and urban components, presenting a need for integrated infrastructure development.
- In contrast, **Koper's compact old city**, covering just **13 km<sup>2</sup>**, emphasizes traffic regulation and historical preservation.
- The geographic layouts of **Rethymno, Nis, and Koper** reflect a blend of urban and rural needs, while **Novo Sarajevo and Gorizia** focus predominantly on urban mobility challenges.

From an administrative perspective, most territories, such as Novo Sarajevo, Nis, and Koper, operate within single jurisdictions, facilitating governance and decision-making. However, Gorizia’s inclusion of municipalities like Sagrado and Turriaco highlights the complexities of cross-jurisdictional coordination.

Population density also varies significantly across the pilot territories. Novo Sarajevo, with **6,370.1 inhabitants per km<sup>2</sup>**, faces intense urban demands, while territories like Niš and Koper have population clusters in central areas requiring targeted mobility solutions. In contrast, **Rethymno** and **Shkodra** exhibit more **dispersed population patterns**, combining dense urban zones with sparsely populated rural regions, which adds complexity to ensuring equitable transport connectivity. **Gorizia**, with its **moderate density**, presents a balance between urban and suburban mobility needs, often requiring coordination across neighboring municipalities.



**Figure 1: Area and Population Density of Pilot Territories**

**Land-use and zoning regulations** differ widely among the territories. **Koper** demonstrates **advanced zoning practices**, including pedestrian zones and traffic restrictions. **Rethymno** and **Nis** integrate mobility considerations into their **urban master plans**, while **Shkodra**, in contrast, lacks extensive zoning and relies on **traditional mobility patterns**.

The planned projects reflect the priorities of each territory. **Rethymno** focuses on **sustainable urban development**, while **Nis** and **Koper** explore **pedestrianization** and **high-speed rail projects**. In contrast, **Novo Sarajevo** and **Gorizia** prioritize **maintenance over expansion**.

In summary, these territories illustrate a **wide spectrum of mobility needs and strategies**, shaped by their unique geographic, demographic, and administrative contexts. **Challenges**, such as infrastructure gaps, high urban density, and balancing historical preservation with mobility, persist, but **opportunities** emerge through shared zoning practices, sustainable strategies, and coordinated regional projects.

## 2.2. Traffic Data

### 2.2.1 Overview of Modal Shift in Transportation

The transportation landscape varies significantly across the pilot territories. In most areas, **personal vehicles** dominate, with **Novo Sarajevo** (40%), **Rethymno** (60%), and **Nis** (55.6%) showing high reliance on cars, indicating a car-dependent culture. Public transport adoption, however, is more inconsistent. **Shkodra** reports a particularly low uptake at just **2%**, whereas **Novo Sarajevo** has a moderate **30%** usage rate. Interestingly, **Shkodra** also stands out with **23%** of its population cycling, far surpassing other territories like **Novo Sarajevo** (15%) and **Rethymno** (5%). Additionally, **walking** is common in **Shkodra** (35%) and **Nis** (25.8%), possibly reflecting better accessibility or limited transportation options.



Figure 2: Modal Shift in Transportation Access Across Pilot Territories

### 2.2.2 Traffic Congestion Levels

Congestion varies greatly.

- **High Congestion:** **Novo Sarajevo** faces the most significant congestion, likely due to its urban density and traffic inefficiencies.
- **Medium Congestion:** **Rethymno, Nis, Koper, and Shkodra** report moderate congestion levels, pointing to opportunities for improved traffic management.
- **Low Congestion:** **Gorizia** experiences relatively low congestion, possibly due to its smaller urban footprint or better traffic management practices.

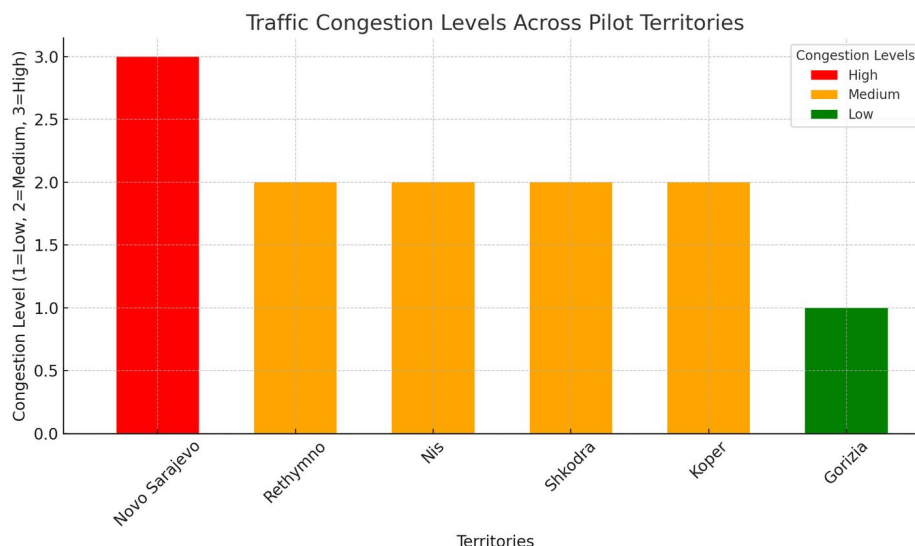


Figure 3: Traffic Congestion Levels Across Pilot Territories

### 2.2.3 Peak Traffic Hours

Traffic peaks predominantly in the early morning (7:00–9:00 AM) and afternoon (12:00–5:30 PM) in most territories. A noteworthy exception is **Rethymno**, where evening traffic also spikes between **6:00–9:30 PM**, pointing to specific local patterns.

### 2.2.4 Real-Time Traffic Monitoring

Only **Rethymno** employs advanced real-time traffic monitoring systems, including thermocameras and software to assess traffic flow and congestion. **Novo Sarajevo**, **Koper**, **Gorizia**, and **Shkodra** are lacking in this area, highlighting a gap in infrastructure that could hinder effective traffic management.

### 2.2.5 Public Transportation Systems

Public transport is universally available, with **buses** being present in all territories. However, the quality and extent of services vary. Notably, **Novo Sarajevo** benefits from a tram system, which is a unique feature in urban transit, while none of the territories have metro systems. **Taxis** are also a common mode of transport in all areas.

### 2.2.6 Initiatives for Optimizing Public Transportation

**Rethymno** has made notable strides with the introduction of **municipal e-buses** and a **smart parking system**. **Koper** is also planning significant improvements, including the creation of a **Mobility Center** to integrate multimodal traffic data. In contrast, **Novo Sarajevo**, **Shkodra**, and **Gorizia** have minimal initiatives, with **Shkodra** having only early-stage ideas for improvement, and **Gorizia** focusing mainly on maintenance.

### 2.2.7 Parking Availability and Monitoring

**Rethymno** and **Koper** are leaders in adopting **smart parking solutions**, utilizing apps and real-time availability systems to optimize parking. However, **Novo Sarajevo**, **Gorizia**, and **Shkodra** lack structured parking monitoring systems, contributing to potential inefficiencies.

## 2.2.8 Key Observations

The heavy reliance on **personal vehicles** in many territories exacerbates **congestion** and environmental concerns. **Real-time traffic monitoring** is a significant missing component in most areas, impeding effective traffic management. The **public transport systems** across these territories need modernization and greater integration, with opportunities to enhance **cycling** and **walking infrastructure** in places like **Shkodra**, where adoption rates are higher. There is also a strong case for promoting **smart technologies** (e.g., parking and traffic monitoring) to optimize urban mobility. Lastly, **regional collaboration** could lead to more sustainable mobility solutions, particularly in reducing car dependency and improving public transportation.

## 2.3 Mobility Data Availability

The collection and availability of mobility data differ widely across the territories, leading to notable gaps in how transportation systems are understood and managed. **Rethymno** stands out for gathering *real-time traffic data*, whereas most other regions rely on sporadic studies or do not collect traffic metrics at all. In terms of public transit usage, the frequency of data collection varies significantly, ranging from *annual surveys* in **Nis** to *daily reporting* in **Gorizia** and *monthly summaries* in **Shkodra**. This inconsistency hinders the formation of a unified picture of how often and why citizens use buses, trams, or other public transport modes.

A prominent issue is the *complete absence* of pedestrian counts across all examined territories, which limits insights into non-motorized travel. Nonetheless, some regions gather more specialized data: **Shkodra** conducts *household travel surveys every 10 years*, offering periodic but valuable glimpses into travel behavior, while **Nis** focuses on *micro-mobility*, tracking e-scooter usage monthly and illustrating a more modern approach to monitoring emerging trends.

When it comes to data collection methods, **Rethymno** and **Gorizia** utilize sensor-based systems to monitor public transport in real time, whereas other areas depend on manual counts or limited internal records. **Nis** is the only territory employing GPS tracking, highlighting its interest in digital solutions, and **Koper** leverages a mobile app for public transport data—a technology with significant potential for adoption elsewhere. Overall, there is a marked *technological divide*, with some territories embracing advanced methods while others rely on basic or infrequent practices.

Despite the varied approaches, data accessibility is generally restricted. Only **Shkodra** makes summarized results *publicly available*, enabling a degree of transparency, while other territories limit data to internal use, inhibiting broader stakeholder engagement. The lack of open data also reduces opportunities for external analysis and collaboration.

Funding and coordination present further obstacles, affecting almost every region except **Gorizia**, which appears less constrained by financial issues. **Novo Sarajevo**, **Rethymno**, **Koper**, and **Shkodra** have recognized the need for technological upgrades, but they also face *challenges in aligning multiple agencies* and stakeholder groups. Without better collaboration, acquiring and sharing consistent data becomes an even greater challenge.

In summary, mobility data collection remains *fragmented*, with noticeable *gaps in pedestrian statistics* and *limited real-time monitoring* outside of Rethymno. **A single, comprehensive platform or framework** for data sharing could significantly enhance transparency and facilitate cross-territorial comparisons

## 2.4 Data Usage and Analysis

### 2.4.1 Current Uses of Mobility Data

Mobility data plays a crucial role in several pilots, though its application remains uneven and highlights missed opportunities for broader utilization. For policy-making, only two of the pilots, *Rethymno* and *Nis*, utilize mobility data, indicating a significant underuse of data in shaping transportation policies. In urban planning, *Rethymno* and *Shkodra* benefit from mobility data, yet regions like *Novo Sarajevo*, *Koper*, and *Gorizia* fail to integrate it, resulting in missed opportunities for data-driven urban development. In the domain of traffic management, *Rethymno*, *Nis*, and *Shkodra* use mobility data effectively, while other regions lag, despite the potential to improve traffic flow and operational efficiency. *Shkodra* also excels in public transport planning, emphasizing focused efforts to optimize transit systems. However, this focused effort is not mirrored in other regions, where broader applications of mobility data remain limited.

### 2.4.2 Tools and Software for Data Analysis

The tools and software employed for mobility data analysis vary widely across regions, revealing critical gaps in adoption and capabilities. *Rethymno* uses **GIS (Geographic Information System)** to analyze mobility data, though it requires ongoing updates, while other territories **miss the potential of GIS to integrate spatial data into analysis**. Custom applications are employed in *Rethymno*, *Nis*, *Koper*, and *Gorizia*, primarily for parking or transit-related tasks. However, these tools often lack standardization, limiting their **scalability and interoperability** across regions. A significant observation is the **absence of advanced statistical tools**, as no region reports using them, resulting in **missed opportunities for deeper quantitative analysis** and data-driven decision-making.

### 2.4.3 Data Gaps and Limitations

Several challenges limit the effective use of mobility data. In terms of **collection gaps**, *Novo Sarajevo* and *Gorizia* lack systematic processes, while *Shkodra* relies on unreliable public transport tracking systems. *Koper* highlights gaps in **predictive analytics for traffic management**, which hampers its ability to forecast and optimize. **Software challenges** also persist; for instance, *Rethymno* reports expired licenses for data processing software, while *Koper* requires upgrades for parking space monitoring and adaptive traffic light systems. Integration remains another issue, as highlighted by *Koper*, which identifies the need for a **central mobility data system** to improve real-time decision-making and optimize networks.

### 2.4.4 Suggested Improvements

The responses from the questionnaire highlight several improvements identified by the respondents to enhance mobility data collection and analysis:

- **Systematic data collection:** *Novo Sarajevo* and *Gorizia* emphasized the need for systematic data processes and the adoption of technologies like sensors, GPS tracking, and mobile apps.
- **Software upgrades:** *Rethymno* and *Koper* pointed out the importance of updating outdated software to improve functions like traffic light optimization and parking monitoring.
- **Centralized mobility data system:** Respondents from *Koper* also suggested creating a centralized system for integrating traffic, public transport, and pedestrian data.

- **Predictive analytics tools:** *Shkodra* and *Koper* indicated that tools for predictive analytics would help forecast transit and traffic patterns more effectively.

## 2.4.5 Key Insights

The analysis highlights critical areas for improvement. First, while some regions utilize mobility data effectively in domains such as **policy-making, urban planning, and traffic management**, the **overall application remains limited**, with most regions failing to harness its full potential. Second, reliance on **outdated software** and the lack of advanced tools undermine the effectiveness of data analysis. Finally, achieving **integration through a centralized and updated system** is paramount to unlocking the full potential of mobility data, enabling informed decision-making across regions.

## 2.5. Urban Mobility Problems

### 2.5.1 Existence of Sustainable Urban Mobility Plans (SUMPs)

Sustainable Urban Mobility Plans (SUMPs) are present in some of the territories but remain fragmented in others. *Rethymno*, *Nis*, and *Koper* have detailed SUMPs, with *Koper* currently in the process of developing a new plan. *Canton Sarajevo* has a regional SUMP; however, the *Novo Sarajevo Municipality* lacks its own plan, creating a **gap in localized mobility planning**. In regions such as *Gorizia*, efforts are fragmented, as only partial plans exist, underscoring **incomplete strategies for sustainable urban mobility**.

### 2.5.2 Main Urban Mobility Problems

Urban mobility issues are widespread, with both common and region-specific challenges. Traffic congestion is a prevalent issue in most regions, especially in city centers and during peak hours. Lack of public transit particularly affects rural and less populated areas, while parking shortages are critical in *Nis* and *Koper*, where motorization rates are increasing. Safety concerns such as narrow streets, blind intersections, and the usurpation of sidewalks by parked vehicles further hinder pedestrian and cyclist mobility. Environmental challenges are evident in *Koper*, which struggles with air pollution and noise caused by freight and tourist traffic. Region-specific issues include *Koper's* elevation differences that complicate mobility for cyclists and pedestrians, *Sarajevo's* incomplete bike lanes that worsen congestion, and *Shkodra's* failure to respect road signs, which poses significant safety risks.

### Most Affected Group

The challenges in urban mobility disproportionately affect certain groups. Daily commuters, including workers and students, experience delays and unreliable transit services. Tourists, especially in cities like *Koper* during peak tourist seasons, face navigation difficulties and increased congestion. People with disabilities encounter significant accessibility barriers due to incomplete infrastructure and heavy reliance on cars. Rural residents face limited access to public transport, resulting in longer travel times and greater isolation from urban centers.

### Specific Locations and Times

Certain areas and timeframes consistently experience the worst mobility challenges. **City centers** are the most congested zones in most regions, while **industrial zones** see high freight traffic that strains road networks. **Rural zones**, on the other hand, are marked by poor transport services that lead to inefficiencies. Time-specific

challenges include **peak congestion during morning and evening rush hours** (7–8 AM and 3–5 PM) and **seasonal spikes** during summer holidays and special events, particularly in tourist-heavy cities like *Koper*.

### **Modes of Transportation Most Affected**

Both **cars and public transport** face significant challenges. High reliance on cars contributes to congestion, while inadequate public transport systems—without dedicated lanes or prioritized routes—reduce transit efficiency. Cyclists and pedestrians also struggle, with cyclists facing **a lack of infrastructure** and pedestrians contending with **unsafe sidewalks and poor accessibility**.

### **Other Mobility Challenges**

Urban mobility is further constrained by infrastructure and behavioral issues. **Narrow streets and incomplete bike lanes** hinder smooth movement, particularly for non-motorized transport. Terrain challenges, such as **elevation differences in Koper**, further reduce walking and cycling accessibility. **Behavioral issues**, including non-compliance with road signs and poor driving discipline, exacerbate safety risks in regions like *Shkodra*.

### **2.5.3 Impact on People**

Mobility challenges have direct consequences for residents, commuters, and other affected groups. Delays and higher travel costs disproportionately impact daily commuters. Increased car reliance elevates safety risks for pedestrians, cyclists, and people with disabilities. For rural and less developed areas, limited access to public transport restricts connectivity to urban centers, compounding economic and social disparities.

### **2.5.4 Key Recommendations**

Addressing these challenges requires targeted actions across multiple domains. Municipalities like *Novo Sarajevo* and *Gorizia* should **develop or enhance comprehensive SUMPs** to create strategic mobility frameworks. Public transit systems need improvement through **dedicated transit routes, expanded coverage in rural areas, and enhanced accessibility** for vulnerable groups. Infrastructure gaps, including **incomplete bike lanes and unsafe sidewalks**, must be addressed to support non-motorized transport. Technology solutions like **real-time tracking and adaptive traffic management systems** should be implemented to optimize mobility during peak times. Finally, efforts to **promote sustainable transport**, including the use of bikes, e-scooters, and public transit, are essential for reducing congestion and environmental impact.

## **2.6 Smart Mobility Readiness**

The responses to the questionnaire highlight varying levels of readiness across the six pilot territories for implementing smart mobility solutions. Readiness is assessed through the existence of supportive infrastructure, previous smart mobility initiatives, and collaboration with stakeholders.

### **2.6.1 Digital Infrastructure Availability**

The availability of digital infrastructure in the pilot regions reveals notable disparities. **Rethymno** demonstrates advanced infrastructure with systems like thermal cameras, a smart parking system, and platforms for e-bikes and PV charging monitoring. **Niš** has implemented IoT sensors as part of its digital strategy but lacks other

critical components like 5G or cloud services. **Koper** benefits from its deployment of **5G** technology but requires further integration and expansion of its digital capabilities.

In contrast, **Novo Sarajevo** has limited infrastructure, relying primarily on IoT sensors without comprehensive integration into mobility systems. **Gorizia** and **Shkodra** exhibit minimal digital infrastructure, with no significant systems in place to support advanced mobility solutions, requiring substantial investments to bridge the gaps.

### **2.6.2 Existing Smart Mobility Initiatives**

The current state of smart mobility initiatives varies across regions. **Rethymno** leads with several implemented projects, including thermal cameras, a smart parking system, and digital tools to monitor PV charging and e-bikes. **Niš** is making progress with its "Smart and Safe City" project, although it is still in the implementation phase.

**Koper** has initiated collaborations to develop projects like its planned Mobility Center, which aims to centralize real-time traffic data and optimize mobility management. However, **Novo Sarajevo**, **Gorizia**, and **Shkodra** report no ongoing smart mobility initiatives.

### **2.6.3 Stakeholder Collaboration**

Stakeholder collaboration is crucial for advancing smart mobility initiatives, and the level of collaboration varies across the regions. **Rethymno** has established partnerships, such as its collaboration with COSMOTE for parking projects, demonstrating strong stakeholder engagement. **Niš** actively collaborates with the City Science and Technology Park to support its projects.

**Koper** benefits from its collaboration with the University of Maribor in projects related to transport engineering. Conversely, **Novo Sarajevo**, **Gorizia**, and **Shkodra** exhibit limited collaboration, which significantly impacts the pace and scale of smart mobility development.

## **2.7 Barriers and Drivers to Smart Mobility**

The questionnaire responses provide valuable insights into the main barriers and drivers influencing the adoption of smart mobility solutions in the six pilot territories. While some regions demonstrate progress, several challenges hinder the effective implementation of smart mobility projects. These barriers and drivers are further explored in the deliverable **D.1.1.3 "Analysis of drivers and barriers to smart mobility solutions uptake in the Adriatic-Ionian area"**.

### **2.7.1 Identified Barriers**

A common barrier across multiple pilot territories is the **high cost of technology implementation**. Respondents from all the territories highlighted that financial constraints significantly limit the deployment of new smart mobility solutions. This financial issue is closely tied to regulatory and technical obstacles which is also highlighted by all the pilots.

**Outdated regulations** were reported by **Novo Sarajevo**, **Rethymno**, **Nis** and **Shkodra**, where restrictive or unclear policies delay the introduction of innovative technologies. These regulatory hurdles create additional costs and complicate project approval processes.

Moreover, **technical challenges** (e.g., data integration, system interoperability) pose significant challenges in **all territories**, where existing systems do not support the demands of data-driven mobility initiatives.

Another key barrier is the **resistance to change**, highlighted by territories like **Rethymno, Nis** and **Koper**. Without widespread understanding and public support, adoption rates of new technologies and initiatives remain low, limiting their overall impact on mobility systems.

## **2.7.2 Key Drivers**

Several key drivers were identified in the responses, showcasing the potential for progress in smart mobility implementation. A major driver across multiple regions is **improving efficiency of transportation networks**, and also the commitment to **sustainability goals**. Almost all the territories view environmental concerns and the EU's green transition policies as strong motivators for adopting smart and eco-friendly transport solutions.

**Enhancing public transport access and reducing congestion** emerged as a key driver in most pilot territories. Respondents emphasized the importance of improving public transit networks to reduce car dependency, ease traffic congestion, and promote sustainable urban mobility. Almost in all territories the public transport improvements could have a transformative impact on mobility patterns.

Overall, addressing barriers while leveraging key drivers will be crucial in promoting successful smart mobility adoption in the six pilot territories. The findings here provide a preliminary overview, which is expanded in D1.1.3 which focuses on detailed barriers and recommendations.

## **2.8 Future of Smart Mobility**

### **2.8.1 Expected Timelines for Implementation**

The expected timelines for the adoption of smart mobility solutions vary across regions, reflecting differences in readiness and current progress. **Nis** and **Gorizia** foresee the adoption of smart mobility within the next **3-5 years**, driven by ongoing initiatives and anticipated investments. **Novo Sarajevo, Koper,** and **Rethymno** anticipate a longer timeline of **5-10 years** and **Shkodra** is uncertain. These differences highlight the need for tailored implementation strategies and targeted support for regions facing delays.

### **2.8.2 Suggested Incentives for Accelerating Adoption**

To expedite the adoption of smart mobility solutions, the questionnaire responses emphasize several key incentives:

- **Investments in technology and innovation hubs** were identified as the most critical by most pilots, with respondents highlighting the importance of funding innovation centers to support technological advancement.
- **Tax breaks or incentives for companies using green transport** were also frequently selected, indicating that financial incentives to private companies could play a major role in promoting smart mobility solutions.
- **Public awareness campaigns** were also highlighted as one of the essential components for ensuring the public acceptance of smart mobility initiatives.

By addressing these timelines and implementing the suggested incentives, the pilot territories can move toward faster, more effective adoption of smart mobility solutions, fostering sustainable urban development across the region.

### **3. Conclusions**

The analysis and findings presented in this report underscore the significant role of mobility-related data in planning and implementing effective smart mobility solutions within the Adriatic-Ionian region. By assessing data availability, usage, gaps, and regional differences, several key takeaways and actionable insights have been identified.

First, the availability of comprehensive and reliable mobility data remains uneven across the six pilot territories. While some of the pilots have made strides in real-time data collection and analysis, others face significant gaps in pedestrian counts, traffic monitoring, and public transport data. Addressing these disparities will be essential for fostering a unified approach to mobility management.

Second, the underutilization of advanced tools and software for data analysis highlights an area for improvement. The widespread adoption of technologies such as GIS, predictive analytics, and real-time tracking systems could enhance decision-making and operational efficiency. A centralized data platform could further improve accessibility and encourage cross-border collaborations.

Third, barriers such as outdated regulations, financial constraints, and technical interoperability challenges pose obstacles to the seamless implementation of smart mobility initiatives. Overcoming these barriers requires targeted investments, policy reforms, and enhanced stakeholder collaboration.

Despite these challenges, the presence of strong drivers—including environmental concerns, sustainability goals, and the desire to improve public transport—provides a positive outlook for smart mobility adoption. Collaborative efforts, public awareness campaigns, and incentives for private sector engagement can accelerate progress.

In conclusion, addressing the identified data gaps, promoting technological advancements, and fostering regional collaboration will be crucial for the successful deployment of smart mobility solutions in the Adriatic-Ionian region. This report serves as a guiding resource for stakeholders to develop actionable strategies and contribute to the shared vision of sustainable urban mobility.

### Smart Mobility Deployment Questionnaire

Section		Description	Novo Sarajevo	Rethymno	Nis	Koper	Gorizia	Shkodra
<b>1</b>		<b>General Information</b>						
	1	Name of the Pilot Territory/City	Municipality of Novo Sarajevo	Rethymno (Municipality of Rethymno)	City of Niš	Koper	GORIZIA	Shkodra City
	2	Name and Position of the Respondent	Amar Agić, Senior Associate for project preparation and implementation	Deputy Mayor of City Planning, Traffic issues and IT and the Deputy Mayor of Technical services, Programming and Municipal Property	Ivana Miljanović, Advisor	Darka Jezeršek Žerjal, Project Manager	DI BENEDETTO, MANAGING DIRECTOR	andrea jakova, Director on International Relation
	3	Contact Information						
	4	Organization	Municipality of Novo Sarajevo	Municipality of Rethymno	Office for local economic development, City of Niš	Municipality of Koper	APT SPA	Regional Council of Shkoder
<b>2</b>		<b>Territorial Data</b>						
	1	What is the total area of the pilot territory? (In square kilometers)	9.9	397.48	596.71	1	20	872
	2	Describe the geographic layout of the pilot territory (e.g. urban, rural, mixed etc. Give as much details that you can.)	Urban	Mixed	Mixed urban and rural territory	Mixed	URBAN	Infrastructure: Shkodra has a relatively developed infrastructure compared to rural parts of Albania. This includes road networks, public transport, and a mix of modern and older buildings. There is a notable presence of markets, shops, schools, and hospitals, contributing to its role as a local center.

D1.1.2 Report on availability of mobility-related data and problems (final)

3	Does the territory span across multiple municipalities, districts, or administrative divisions? (e.g. does the area include more than one city, town, country or other jurisdictional unit?) If Yes, please identify which ones.	No	No. Consisting of 4 Municipality units	No	No.	YES. SAGRADO, TURRIACO	This territory included just City of Shkodra
4	What is the current population density in different zones of the territory? (Please provide figures/maps if available)	Average density: 6.370,1 inhabitants per km <sup>2</sup>	57216 (34085 in the city of Rethymno)	Current population density for City of Niš is 420 st/m <sup>2</sup> . In different zones of the territory is: City municipality Medijana: 8,169 people/km <sup>2</sup> City municipality Niška Banja: 106 people/km <sup>2</sup> City municipality Palilula: 623 people/km <sup>2</sup> City municipality Pantelej: 298 people/km <sup>2</sup> City municipality Crveni Krst: 182 people/km <sup>2</sup>	The population density of the Old city of Koper is relatively high compared to other parts of the city due to its compact urban layout and historical significance. While the exact population density can vary depending on the specific boundaries considered, the Old Town has approximately 4,000 residents within a small area. Given its limited size, the population density is estimated to be around 4,000â€”5,000 people per square kilometer. This is higher than the overall average for Koper, which has a more dispersed population across the wider municipality.	155 SAGRADO. 541 TURRIACO	The population in Shkodra Municipality is 213,217 inhabitants, with the highest population concentration in the city of Shkodra with 116,593 inhabitants. The administrative units, the highest population concentration is the Rrethina unit with 29,115 inhabitants, and the lowest administrative unit is Shosh with 1,862 inhabitants.

D1.1.2 Report on availability of mobility-related data and problems (final)

5		<p>Are there specific land-use plans or zoning regulations in place that impact mobility infrastructure? <i>Yes/No. If yes, please provide details.</i></p>	<p>Yes, there are regulatory plans and planning documentation for certain areas that incorporate mobility infrastructure</p>	<p>Yes. Residential Control Zone, Urban Master Plan, Decree of the President of the Republic regulating the old town of Rethymno</p>	<p>The area of the City of Niš, as a local government unit, is covered by the City of Niš Development Plan for the period from 2021 to 2027 (2021) and the Spatial Plan of the Administrative Area of the City of Niš 2021 (2011), with amendments and supplements adopted in 2022. For the urban area of the City of Niš, which covers 44.7% of the administrative area, the General Urban Plan of Niš 2010-2025 (2011) is in effect. This plan has undergone four subsequent amendments: in 2016, 2018, 2021, and 2024.</p>	<p>In the old city center of Koper there are 7 zones:          1. Pedestrian zone with a complete ban on motor traffic;          2. Pedestrian zone with limited local traffic;          3. Paid parking area;          4. Permit parking area;          5. Speed limit area;          6. Reserved parking spaces for the needs of legal and natural persons registered to conduct activities;          7. Calm traffic zone, allowed for driving and parking vehicles with a permit.          The highest level of traffic restrictions for motor vehicles applies to the areas in Group 1, where even delivery vehicles are not allowed access.          In Group 2, delivery vehicles are allowed access as long as they do not obstruct or endanger pedestrians.          In areas closed with a movable physical barrier, authorized individuals must obtain a certificate that allows them passage.          The calm traffic zone encompasses all areas within the city center primarily intended for pedestrian movement, but exceptionally, vehicles are allowed to drive, stop, and park in accordance with the posted traffic signage.</p>	NO	No
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						<p>Delivery vehicles may use these areas only for driving and stopping, with stopping defined in the ordinance as any interruption of driving for as long as necessary to load or unload cargo. In the other areas, delivery vehicles are allowed to drive, subject to parking possibilities according to the restrictions in each specific zone. Delivery in the city center area is only possible during the times specified on the traffic signs. For example, at the entrances to StaniĀev Square, Gortanov Square, and TomiĀeva Street, the delivery window is set between 7 and 9 AM. At certain locations, designated areas for delivery vehicles are marked for loading and unloading, including traffic signs that specify time restrictions.</p>	
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D1.1.2 Report on availability of mobility-related data and problems (final)

	6	Are there any planned construction projects or urban expansions that may affect mobility in the near future? Yes/No. If yes, please list and provide as much details as you can.	No	Yes. Sustainable Urban Development Strategy Plan	The "Urban Mobility" project, which has not yet started implementation, improves urban mobility. Additionally, the introduction of a high-speed rail line is planned, as well as the construction of the Southern Boulevard.	Yes. - It is planned to gradually pedestrianize Koper's old town and certain parking areas - Vertical mobility connection between the old town center and the rest of the city	NO	Yes , the entry of the city will change
<b>3 Traffic Data</b>								
	1	What are the modal shift of transportation used in the pilot territory? if known in %. (It can also be an estimate.)				No data.	ALL MODAL SHIFT OF TRANSPORTATION. DATA NOT AVAILABLE	personal vehicles, public transport, cycling, walking
		personal vehicles,	40%	60%	55.56%			
		public transport,	30%	public transport: 15% (bus: 10% and taxi:5%)	12.03%			
		cycling,	15%	5%	5.40%			
		walking	15%	20%	25.80%			
	2	How is the current state of traffic congestion in the pilot territory? (High, Medium, Low)	High	Medium	Medium	Medium	Low	Medium
	3	What are the peak traffic hours in the pilot territory?	07-08 h AM; 15-17h PM	8:00-10:00 13:30-15:30 18:00-21:30	6:30 - 7:30 AM	7-10, 14-17	7,30-8,00 / 17.00-17.30	07:00-09:00 12:00-16:30
	4	Is there real-time traffic monitoring in place?Yes/No; If yes, what types of data are collected ?	No	Yes. Thermocameras and respective web based software for monitoring and data analysis for: Traffic flow, vehicle types	Currently, we do not have the exact information	No.	NO	No
		traffic flow,						
		vehicle types,						
		congestion levels						
	5	What are the key public transportation routes and services in the pilot territory?						

		bus,	✓	✓	✓	✓	✓	✓
		tram,	✓					
		metro						
		other/please specify		Taxi				
6	Are there any initiatives or projects aimed at optimizing or enhancing public transportation? If yes, please provide details.	Yes , but It's not under jurisdiction of The Municipality. Ministry of Traffic of Canton Sarajevo is implementing many projects that will improve public transport	Yes. Just bought 2 Municipal e-buses to contribute to the public transport system	The study of public urban transport, previously conducted in 2018.	Yes. - A mobility center is planned to be established, integrating data from all types of traffic, both for planning purposes and for users. - The establishment of a Regional Mobility Center is also planned, serving as a connection with other municipalities.	NO	No just some ideas	
7	Is there a system for monitoring parking availability? If yes, please provide details.	No	Yes. Smart Parking System with App where the user can detect free parking spaces	There is a project called "Smart and Safe City", but it has not yet been implemented.	Yes. - Underground Garage Belvedere - Real-time Parking Availability: Monitoring the occupancy of parking spaces in real time, providing users with information on available spots. - Private system Easy park system and app that allows users to find, pay for, and manage parking easily via their smartphones. It simplifies the parking process	NO	No	
<b>4</b>		<b>Mobility Data Availability</b>						
1	What types of mobility-related data are available to collect in the pilot territory Yes/No	No	Traffic patterns	Currently, we do not have the exact information	Public transit usage;micro-mobility " e-scooters	Public transit usage		
	traffic patterns,	Not available	Real-time	Not available	Not available	Not available	Not available	
	public transit usage,	Not available	Not available	Not available	Annually	Daily	Not available	

		pedestrian counts	Not available	Not available	Not available	Not available	Not available	Not available
		other/please specify	Data are not collected	Not available	Currently, we do not have the exact information	micro mobility - E-scooter - monthly	NOT AVAILABLE	
	2	How frequently is this data collected?						No data collected
		real-time,	Answers are above for each type of mobility-related data.					
		daily,						
		weekly,						
		monthly,						
		annually						
	3	What methods are used to collect mobility data?	No					
		sensors,		✓			public transport - internal data	
		GPS tracking,			✓			
		mobile apps,				✓		
		other/please specify				public transport - internal data		Method with persons
	3	Is the data publicly accessible? Yes/No; If yes, please provide the link or access details	No	No.	No	No.	NO	No
	4	What challenges do you face in data collection?						
		funding,	✓	✓	✓	✓		✓
		technology,	✓	✓		✓	✓	✓
		coordination,		✓	✓	✓		✓
		other/please specify						
<b>5 Data Usage and Analysis</b>								
	1	How is the mobility data used in your pilot territory?	No					
		policy-making,		✓	✓			
		urban planning,			✓			✓
		traffic management,			✓	✓		✓

D1.1.2 Report on availability of mobility-related data and problems (final)

	other/please specify						PUBLIC TRANSPORT PLANNING	
2	What tools or software do you use for data analysis?	No						
	GIS,			✓				
	statistical software,							
	custom applications,				✓	✓	✓	✓
	other/please specify		Note:GIS under modification			parking garage-custom application		
2	Are there any gaps in the data that hinder effective analysis? Yes/No; If yes, please specify	No data are collected	Yes. Software needs to be updated.	Yes, in public transport, there is an unreliable system for tracking vehicles (prediction of bus arrivals at stops). There are issues with predicting arrivals.	We do not systematically analyze the data.	NO	Yes we have gaps ,we don t have the technology for those analysis	
4	What improvements would you like to see in data collection and analysis, please specify	No data are collected	Data collected from thermocameras need to be uploaded to a new software-Lincence of the previous one has expired.	Software improvements are needed to better utilize the data obtained from existing sensors, such as occupancy of parking spaces, and to implement an adaptive traffic light system	There is a need for a central mobility data system where all data is collected, integrated, and analyzed to support real-time decision-making and enable effective mobility planning, improving efficiency, sustainability, and user experience across transportation networks.		Analysis about the traffic , how many cars come in and go out of area	
<b>6 Urban Mobility Problems</b>								

1		Does the municipality have a Sustainable Urban Mobility Plan (SUMP)? Yes/No; If yes, please provide the link or access details	Municipality of Novo Sarajevo doesn't have SUPM but Canton Sarajevo adopted SUMP 2019. Municipalities took the participation in creating the SUMP. link: <a href="https://ms.ks.gov.ba/sites/ms.ks.gov.ba/files/SUMP.pdf">https://ms.ks.gov.ba/sites/ms.ks.gov.ba/files/SUMP.pdf</a>	Yes. <a href="https://www.rethymno.gr/files/items/1/11121/oristik_o_shedio_drasis_sbak_dimoy_rethymnis.pdf?rnd=1682670676">https://www.rethymno.gr/files/items/1/11121/oristik_o_shedio_drasis_sbak_dimoy_rethymnis.pdf?rnd=1682670676</a>	Yes. <a href="https://sumpnis.info/index.php">https://sumpnis.info/index.php</a>	The city of Koper, is currently in the process of developing a new SUMP, which is scheduled to be completed in early 2025. This new plan will replace the existing SUMP from 2017 and will incorporate updated goals and measures to continue improving the city's transportation infrastructure and reduce environmental impact. <a href="https://www.koper.si/obcina/obcinska-uprava/urad-za-gospodarske-dejavnosti-okolje-in-promet/obcinska-celostna-prometna-strategija/">https://www.koper.si/obcina/obcinska-uprava/urad-za-gospodarske-dejavnosti-okolje-in-promet/obcinska-celostna-prometna-strategija/</a>	NO	Yes just some partial plans
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D1.1.2 Report on availability of mobility-related data and problems (final)

		<p><b>What</b> are the main mobility-related problems in your urban area? e.g. congestion, lack of public transit, safety issues etc. Please describe.</p>	<p>Congestion, lack of public transit, safety issues.</p>	<p>Congestion, lack of public transit, anarchy and lack of parking spaces</p>	<p>Congestion in central areas, safety issues, an increase in motorization. Poorer transport services in rural areas and less densely populated zones.</p>	<p>CITY OF KOPER                      1. Traffic Congestion                      Tourist Season: In summer, due to an increased number of tourists, traffic jams occur on major access roads (e.g., from the highway and coastal roads).                      Daily Commuting: Many people commute daily to Koper for work or school, causing traffic overloads, especially during morning and afternoon rush hours.                      2. Overload of Freight Traffic                      Port of Koper: A large volume of cargo passing through the port puts pressure on the road network, especially near highway junctions and bypasses.                      Cross-Border Traffic: Proximity to the Italian border adds further stress due to international traffic.                      3. Environmental and Sustainability Issues                      Traffic Noise and Air Pollution: Due to heavy road traffic, particularly near the Port of Koper, environmental problems are significant.</p> <p>OLD CITY OF KOPER:                      Traffic in Koper's old town faces several specific challenges stemming from its historical design, limited spatial capacity, and the</p>	<p>RARELY CONGESTION</p>	<p>Lack of public transit , Road of bicycles , supply schedules of business tools ect</p>
	<p>2</p>							

						<p>area's significance for tourism. The main issues include:</p> <ul style="list-style-type: none"> <li>- Limited Space: Narrow streets and historical architecture do not allow for the development of new parking facilities.</li> <li>- Deliveries and Supplies: Delivery vehicles servicing shops, restaurants, and cafes create additional traffic congestion on narrow streets.</li> <li>- Tourist Traffic: During summer, there is increased pressure on access points to the old town due to tourism.</li> <li>- Narrow streets: Poor traffic conditions, especially for larger vehicles, increase the risk of accidents and damage to infrastructure.</li> <li>- Blind Intersections: Some areas, due to their historical design, are less visible, posing risks for pedestrians, cyclists, cars...</li> </ul>		
		<p><b>Who</b> is most affected by this mobility issues? (commuters, students, tourists)? Please give</p>	<p>The most affected are all citizens of the Municipality, especially people with disabilities.</p>	<p>Commuters and locals/tourists</p>	<p>Daily commuters: workers, students during peak hours, and residents of rural areas with limited access to alternative transport options.</p>	<p>residents, commuters</p>	<p>COMMUTERS STUDENTS</p>	<p>citizen ,tourists and businesses</p>

	information/ describe						
	<b>Where</b> do this mobility problems occur? Are there specific locations or areas in the territory where these problems are more prominent? e.g. city center, industrial zones, residential areas, public transport stations etc.	The problems occur on public transport stations and crossroads across the Municipality	City center, entrances and exits of the city (East, West, South)	Central areas and rural areas with low population density face different problems. Central zones are primarily affected by congestion, safety concerns, and high motorization, while rural areas struggle with limited access to transport alternatives and less frequent public transport services.	city center	CITY CENTER AND INDUSTRIAL ZONE	The center and the entry and some touristic zones
	<b>When</b> do these mobility problems typically occur? Are these issues more common during certain times of the day, week, or year? e.g. morning and evening rush hours, weekends, holidays, special events, etc.	07-08 h AM, 15-17h daily PM;weekends, holidays, special events	Rush hours, start and end of schools, opening hours of shops	In central areas, the issues occur during peak periods, while in rural areas, the problems arise during off-peak hours, as they have regular transport services during peak times.	all year, morning/afternoon rush hours, summer months	MORNING/EVENING WORKING DAYS	School holidays and summer holidays
	<b>Which</b> types of transportation are most affected? e.g. pedestrians, cyclists, cars, public transportation (bus, metro etc.)	Cars, public transportation -bus, tram, trolleybus)	pedestrians and private vehicles	Public transport lacks prioritization and dedicated routes. Cyclists face a lack of infrastructure. Pedestrians experience the usurpation of existing sidewalks by parked cars, everywhere except in the city center.	cars	BUS AND CARS	Cars and public transportation

		Are there any other urban mobility-related problems you would like to highlight? If there are any additional mobility challenges not covered above, please describe them.	Existing bike lanes are not complete, existing routes are with a lot of gaps which generate urban mobility-related problems (congestion and conflict points)	small sidewalks/ cycle lanes improvement and network expansion	No	Due to the elevation differences in the city of Koper, access by bike or on foot is made more difficult, particularly when moving between the old town and the surrounding areas. The city's terrain, with its steep inclines and narrow streets, presents challenges for pedestrians and cyclists, limiting mobility and accessibility. This results in increased reliance on cars.	NO	Failure to respect road signs
	3	How do these mobility-related problems affect different groups of people in your city, such as commuters, students, tourists, people with disabilities and other specific groups? e.g. do certain groups face more significant delays, higher costs, or safety risks than others.	Transport delays, higher costs of travel, safety risks	All of them. Increased car use increases safety risks for pedestrians/ disabled and so on..	Mobility-related problems impact different groups in various ways, such as commuters facing traffic congestion, students struggling with unreliable transportation, and tourists experiencing navigation difficulties in unfamiliar systems. Additionally, people with disabilities encounter accessibility barriers, and rural residents face limited transport options, leading to longer travel times and increased dependence on private vehicles.	Commuters face parking difficulties, while residents of urban areas could benefit from using public transportation.	NO	Certain groups face more significant delays, higher costs.
<b>7</b>	<b>Smart Mobility Readiness</b>							
	1	Are there any existing smart mobility initiatives or systems in your pilot territory? Yes/No; If yes, please describe the current systems. (You can also link any published documents, websites, articles etc.	No	Yes. Thermal cameras Smart Parking System PV charges monitoring platform e-bikes platform	Yes, project "Smart and safe city" which is not yet implemented	#NAME?	NO	No

		in English. If they are not available in English, please describe as much as possible.)						
2		What digital infrastructure is available to support smart mobility?						
		5G,				✓	✓	
		IoT sensors,	✓	✓	✓			
		cloud services						✓
3		Are there any existing collaborations with tech providers, startups, or research institutes for smart mobility solutions? (You can also link any published documents, websites, articles etc. in English. If they are not available in English, please describe as much as possible.)	No	Yes. For parking. Partner: Cosmote (a member of T group)	Yes, the City of Niš and the Science and Technology Park Niš are actively collaborating	Yes. We are collaborating with the University of Maribor - Faculty of Civil Engineering, Transportation Engineering and Architecture on the MED COLOURS project.	NO	No
<b>8</b>	<b>Barriers to Smart Mobility Deployment</b>							
1		What are the main challenges/barriers to deploying smart mobility in the territory? Please, Select all that apply)						
		Regulatory issues	Very relevant	Very relevant	Very relevant	Partially relevant	Irrelevant	Very relevant
		Insufficient infrastructure	Very relevant	Very relevant	Relevant	Very relevant	Irrelevant	Very relevant
		Lack of public awareness or engagement	Partially relevant	Very relevant	Relevant	Relevant	Partially relevant	Very relevant

	Funding or financial constraints	Very relevant	Very relevant	Very relevant	Relevant	Relevant	Very relevant
	Technical challenges (e.g., data integration, system interoperability)	Very relevant	Very relevant	Very relevant	Very relevant	Partially relevant	Very relevant
	other/please specify						
2	Are there any social or cultural barriers to adopting smart mobility solutions,?				Resistance to change	Lack of trust in technology	
	resistance to change		✓	✓	✓		
	lack of trust in technology,			✓		✓	
	other/please specify	There are not social or cultural barriers					No there aren't social or cultural barriers to adopting smart mobility solutions
3	Are there environmental constraints impacting mobility ? e.g. geography, weather conditions. Please describe. (You can also link any published documents, websites, articles etc. in English. If they are not available in English, please describe as much as possible.)	There are environmental constraints that are impacting mobility such as weather conditions and geographical constraints ( parts of the Municipality are uphill.	Yes. geography, weather conitions <a href="https://gis.rethymno.gr/?lon=24.4766896553307&amp;lat=35.367183733526154&amp;zoom=15">https://gis.rethymno.gr/?lon=24.4766896553307&amp;lat=35.367183733526154&amp;z</a> oom=15	Yes, in some parts of the city	Yes - terrain configuration.	NO	No
	geography,						
	weather conditions						
	other/please specify						
4	Do you face any legal or policy challenges in implementing smart mobility solutions? Please, select all that apply and add more options if applicable.						

D1.1.2 Report on availability of mobility-related data and problems (final)

		outdated regulations,	✓	✓	✓		✓
		lack of data privacy policies					✓
		other/please specify				Suburban public transport is regulated by the state, and the municipality has no influence (e.g., on increasing frequencies...)	
				insufficient political will			
5		What are the primary concerns from local stakeholders regarding smart mobility? e.g. for businesses, residents etc. Please describe. (You can also link any published documents, websites, articles etc. in English. If they are not available in English, please describe as much as possible.)					RESIDENTS
		businesses,	✓		✓		✓
		residents					
		other/please specify		businesses: not conforming to the law residents: not conforming to the law Lack of control and lack of municipal police		We have not yet implemented smart mobility solutions.	Traffic delays make it possible for people not to arrive at work, school and hospital on time.
6		Have there been previous attempts to deploy smart mobility solutions in the territory? Yes/No; If yes, what were the main ?	No	Yes. outcomes: medium challenges:reoperation of shared mobility solutions. Establishment of new PP cooperations.	Yes, "Smart and safe city" project which is not yet implemented	Yes, there have been some efforts and initiatives related to smart mobility solutions in Koper, although they may not be as extensive or fully developed. Bus arrival/departure prediction system.	NO
		outcomes					

		challenges						
		other/please specify						
	7	What support is needed from local or national authorities to facilitate smooth deployment? Please describe						
		financial,	✓	✓	✓	✓	✓	✓
		regulatory,	✓	✓	✓	✓	✓	✓
		technical	✓			✓	✓	✓
		other/please specify						
	8	What do you see as the main barriers to implementing smart mobility solutions? If Yes, please describe						
		High cost of technology implementation	✓	✓		✓	✓	✓
		Lack of infrastructure (e.g., EV charging, data networks)	✓		✓	✓	✓	✓
		Regulatory or policy constraints	✓	✓	✓		✓	
		Lack of stakeholder cooperation (public-private partnerships)		✓	✓		✓	
		Lack of awareness/education about smart mobility			✓		✓	✓
		other/please specify						
<b>9</b>	<b>Drivers of Smart Mobility Solutions</b>							
1	What are the main reasons for adopting smart mobility solutions in your pilot territory? (Please, select maximum three.)							
	Improving efficiency of transportation networks	✓	✓	✓		✓	✓	

		Reducing environmental impact			✓	✓	✓	✓
		Enhancing public transport access	✓		✓		✓	✓
		Reducing congestion	✓		✓	✓		✓
		Improving safety			✓	✓		✓
		Cost reduction			✓			✓
		Other (Please specify)						
	2	What is your primary interest in smart mobility? (Please, select maximum three.)						
		Urban mobility	✓	✓	✓	✓		✓
		Public transport integration		✓	✓	✓	✓	✓
		Electric vehicles and infrastructure	✓	✓				✓
		Ride-sharing and micro-mobility				✓		✓
		Other (Please specify)						
<b>10</b>	<b>Future of Smart Mobility</b>							
	1	In your opinion, when do you foresee smart mobility solutions becoming a standard part of daily life in your territory, with visible deployment and public awareness? (Please select the timeframe that best reflects your view.)						
		In the next 1-2 years						
		In the next 3-5 years			✓		✓	
		In the next 5-10 years	✓	✓		✓		
		More than 10 years						

		Uncertain						✓
1		What incentives do you think would most accelerate the adoption of smart mobility solutions?						
		Government subsidies for infrastructure development			✓		✓	✓
		Tax breaks or incentives for companies using green transport	✓		✓	✓		✓
		Public awareness campaigns	✓	✓	✓			✓
		Enhanced collaboration between public and private sectors		✓	✓	✓		✓
		Investments in technology and innovation hubs		✓	✓	✓	✓	✓
		Policy and regulatory reforms to ease deployment	✓		✓		✓	✓
<b>11</b>	<b>Additional Comments</b>							
1	Do you have any additional insights or recommendations regarding smart mobility deployment in the pilot territory? If Yes, Please describe	Smart Mobility Readiness 2. What digital infrastructure is available to support smart mobility?*	Answer:IoT sensors	No.	NO	/	NO	There are some ideas that we have to put forward that need further discussion and professional solutions
		Given answer is not correct, it is only answered because it was required question and one answer must have been chosen. No digital infrastructure is available.						

## References and resources

European Commission Urban Mobility Framework. [Urban Mobility and Accessibility](#)

European Commission Sustainable Urban Mobility Plan (SUMP) Guidelines. [SUMP Guidelines and Decision Makers Summary](#)

European Commission. European Data Strategy. [European data strategy](#)

United Nations New Urban Agenda. [The new urban agenda](#)

European Commission Smart Mobility and Services Strategy. [Mobility Strategy](#)

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