

Full Report

Advancing Sustainable Mobility in Greece

Supporting SUMP's uptake



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Table of contents

Acknowledgements	3
Executive summary	7
What we did	7
What we found.....	7
What we recommend	8
Sustainable Urban Mobility Plans in the EU: Working towards national SUMP platforms	12
The history of SUMP regulations and guidelines in the EU	12
EU's technical resources for implementing sustainable urban mobility.....	16
Supporting Greece's national SUMP platform	18
How has Greece implemented SUMP?	21
The Greek SUMP Law (Law 4784/2021)	21
Policies, strategies and plans beyond the SUMP Law.....	24
Comparing the Greek SUMP Law with other European countries' laws	25
The SUMP development state of advancement.....	27
The urban and transport context in Greece	36
The urban and regional context in Greece	36
Transport services and responsibilities in Greece	46
What challenges do local authorities face concerning sustainable mobility?	58
Recommendations for sustainable urban mobility management	64
Bridging challenges to data management, monitoring and evaluation	65
The main data challenges faced by local authorities.....	65
Recommendations for mobility data management.....	68
Recommendations to understand and monitor urban freight activity.....	70
Choosing urban transport policy measures for SUMP	75
The objectives of SUMP and mobility measures.....	76
Classification of measures by area types.....	78
What are the transport policy measures?	79
The Excel tool: Sustainable Urban Mobility Measure Selection Tool for Greece	82
Funding the implementation of SUMP measures	83
How can local and national governments evaluate progress towards sustainable mobility?	86
Developing a realistic and robust monitoring and evaluation framework	87
The Objective-Specific Indicator System	89
The Measure-Specific Indicator System	95
The Excel tool: Sustainable Urban Mobility Monitoring and Evaluation Tool for Greece.....	98
Annex I: Summary of national involvement required for the implementation of local mobility measures	100
References	107

Figures

Figure 1. Primary policy documents adopted by the European Commission in the field of sustainable urban mobility	15
Figure 2. The 12 Steps of Sustainable Urban Mobility Planning (Guidelines 2nd Edition).....	16
Figure 3. Status of SUMP National Framework in Europe based on the PROSPERITY project in 2018.....	19
Figure 4. The process of SUMP development in Greece according to Law 4784/2021.....	23
Figure 5. Relationships between SUMPs and other policies, strategies and plans according to the SUMP Law.....	25
Figure 6. Ridgeline plot illustrating the evolution over time of the number of SUMPs being in the preparation and elaboration phase.....	29
Figure 7. Sunburst diagram illustrating the obligation to develop a SUMP and the status quo per municipality type.....	30
Figure 8. Boxplots of the SUMP Preparation and Elaboration duration	31
Figure 9. Scatter plot illustrating the relationship between the total net cost for developing a SUMP, municipalities' population, and the funding mechanism.....	34
Figure 10. Violin plots presenting the distribution of the total net cost per capita for SUMP development in Greece.	35
Figure 11. Administrative structure of Greece under the Kapodistrias, Kallikratis and Cleisthenes reforms.	38
Figure 12. Greek local authorities under the three major administrative reforms.	39
Figure 13. Greek municipalities classified by the Cleisthenes reform.	41
Figure 14. Connected dot plot illustrating the minimum, average, and maximum area, population and gross population density per municipality type.	42
Figure 15. Terrain of the Greek municipalities.....	43
Figure 16. GDP per capita across regional units in Greece	44
Figure 17. Significance of tourism across regional units in Greece.....	45
Figure 18. Analysis of the capacity of the technical departments per municipality type.	46
Figure 19. Greek municipalities covered by urban KTELs, RODA and DEAS KO (adapted from POAS, n.d.).	49
Figure 20. Motorisation rate per region and regional unit (passenger cars per 1 000 inhabitants).....	51
Figure 21. Map of Greece showing the administrative classification of roads and the TEN-T network. ...	53
Figure 22. Main ports in Greece.	55
Figure 23. Airports in Greece.....	56
Figure 24. Goods (thousand tonnes) loaded in each of the 13 regions in the year 2019.....	57

Figure 25. Sustainable urban mobility measures and the objectives they contribute to 77

Figure 26. Measure classification system based on area types. 78

Figure 27. Sustainable urban mobility measures included in the measure selection tool and their relevance to different urban area types and their measure category 81

Tables

Table 1. Types of data to support understanding and monitoring of sustainable urban logistics and potential stakeholders that may generate or collect the data 72

Table 2. Mobility objectives according to the Greek SUMP law and the EU Urban Mobility Framework 76

Table 3: Indicators included in the monitoring and evaluation framework proposed in the context of this project, including two indicator systems, the Objective-Specific System and the Measure-Specific System 90

Executive summary

What we did

This study, implemented in collaboration with DG REFORM, provides technical assistance to the Ministry of Infrastructure and Transport (MoIT) as it establishes a national sustainable urban mobility plan (SUMP) support programme. More specifically, project outputs by the ITF include:

- The “Sustainable Urban Mobility Measure Selection Tool for Greece”: An educational, decision support tool designed to aid local authorities in choosing appropriate transport policy measures that fit their specific urban contexts and that help them meet their desired objectives.
- The “Sustainable Urban Mobility Monitoring and Evaluation Tool for Greece”: A tool designed to support local authorities to calculate indicators to monitor their SUMP using a proposed framework developed by the ITF. The framework, which consists of two indicator systems, was developed to support the MoIT in defining standardised monitoring practices for urban mobility.
- This detailed report.
- A summary report providing the main takeaways of the detailed report.

This detailed report reviews existing EU SUMP policies, guidelines, and resources to ensure the project outputs build on these resources. It details the state of SUMP development in Greece, informed by a comprehensive survey of Greek local authorities, and thirteen online and in-person consultations with a range of local authorities, the MoIT, researchers, consultants, private, and third-party stakeholders. With these inputs and additional research, the report provides an overview of the urban and transport context of Greece, the challenges faced by local authorities in charge of managing urban mobility and the difficulties associated with data collection, management, monitoring and evaluation. The report also provides guidance on using the two accompanying tools. The Excel-based tools are intended to support the MoIT in developing online resources as part of their national SUMP platform.

What we found

Since its introduction by the European Commission’s “Urban Mobility Package” (COM/2013/0913 final), SUMP have been highly promoted in Greece. Greece preceded the European Commission recommendation on “National Support Programmes for Sustainable Urban Mobility Planning” in 2023 with the development of its own national SUMP law in 2019, later updated in 2021. The SUMP law outlines nine mobility objectives as well as a biennial reporting requirement. When considered alongside other EU policy documents and the proposal for the revised regulation on the trans-European transport network (TEN-T) (COM/2021/812 final), there are a total of thirteen broad mobility objectives for local authorities to aim for, and the need to monitor progress at least biennially if not annually (in the case of TEN-T urban nodes).

While there is significant enthusiasm for SUMP (173 local authorities had initiated the SUMP process by mid-2023), there still exist challenges to developing and implementing sustainable mobility plans. Difficulties arise from the highly varied population density, terrain and geography, economic capacity, levels of tourism and technical capacity. Local authorities report resource constraints as a primary factor in effectively implementing and monitoring mobility measures. Other challenges arise the current

regulatory landscape which favours a single provider for public transport, and a lack of clarity with respect to roles and responsibilities between authorities as well as between SUMP and other strategies. Given the diverse challenges across different urban areas in Greece, resources to support local authorities in choosing and monitoring mobility need to be customisable to suit local circumstances. The Sustainable Urban Mobility Measure Selection Tool for Greece provides a resource for local authorities wishing to identify measures suitable for their urban area type that address their priority mobility objectives.

Monitoring and evaluation faces obstacles, as well, due to the associated data collection, management and reporting. Greek local authorities currently collect data in a project-specific manner. The data is not compiled into a continuously updated databases for wider use. Data is difficult to obtain from transport service providers and national datasets sometimes require lengthy procedures to gain access. Travel behaviour data is also collected sporadically depending on available funding. As with many local authorities around the world, those in Greece also struggle to collect data to monitor freight activity but recognise the need to do so. The proposed monitoring framework and associated Sustainable Urban Mobility Monitoring and Evaluation Tool for Greece suggest indicators for tracking progress on mobility objectives and individual measures, prioritising simpler data collection methods to support the establishment of monitoring practices.

What we recommend

Recommendations for sustainable urban mobility management

Promote a balanced mix of transport modes for resilient transport systems that serve both residents and tourists.

Car-centric planning and a strong prevalence of car use has led to capacity constraints (including parking issues), congestion and the associated negative externalities in many Greek cities. Accommodating high influxes of tourists can be particularly challenging in already constrained transport networks. Promoting a more balanced mix of modes can both improve accessibility, as well as make the transport network more resilient during these peaks (ITF, 2023). Smaller municipalities experiencing seasonal capacity constraints require more flexible and scalable approaches to manage seasonal demand while maintaining a basic level of mobility for year-round residents. Shifting public opinion on car use will be a challenge that requires effective engagement and consultation, in addition to improving alternative modes.

Allocate budget and staff support to institutionalise the process of public consultation.

The public consultation process should be accessible and encourage clear, consistent two-way communication. As much as possible, public engagement programs should bring the practitioners to where people are (e.g. public squares, markets) to expand their reach, and make citizens aware of programs. For private enterprises and operators, authorities should also make an effort to conduct targeted outreach.

Adopt a supportive regulatory framework that allows co-ordination between local, regional, and national authorities, and private mobility service providers to implement SUMP measures.

While the national authority is ultimately responsible for updating regulations, the local and regional authorities, as well as the service providers, are well positioned to make sure that regulations are context-appropriate. As such, the process for developing and updating regulations to support the implementation of mobility measures, particularly with respect to innovations in the sector should be collaborative and responsive. Pilot programs and regulatory sandboxes can be a way to give local authorities the autonomy to explore context-relevant solutions, working with service providers, in an environment where risks can

be closely monitored. Existing regulations limit the provision of services like demand-responsive transport, ride-sharing etc.

Clarify the relationship between SUMP and other strategic land use and transport planning policies and processes.

To successfully implement SUMP, their role in the overall planning framework should be made clear. Currently, the plans and studies required to implement SUMP mobility measures in the Greek context exist independently of the SUMP process, making the mechanism for prioritising the implementation of measures unclear and potentially introducing redundancies. The MoIT envisions that pre-existing plans should be integrated in the development of SUMP, for example environmental assessments, climate action plans, strategic transport plans, or accessibility plans. If a SUMP calls for actions that require an update to a pre-existing plan, this approach still means that SUMP actions will be delayed until such an update is made. Clarifying the role of the SUMP in the overall planning framework to local authorities would be beneficial in achieving the SUMP objectives and allow timely implementation.

Recommendations for mobility data management

Establish and maintain spatial databases independent of individual projects.

With startup resources to compile and digitise the available data, a relatively complete database for the city centre could be within the reach of municipalities mandated to develop a SUMP. Coverage should be extended to the rest of the built-up area of the municipality to ensure a clear understanding of needs of all residents—not just those accessing the city centres. As a first step to ensuring spatial and infrastructure data is compiled, local authorities across all technical departments should systematically include a check-in point at the end of a project within the project contract that ensures the spatial data is transferred in a standard format to ease the compilation of a database.

Develop or secure adequate long-term spatial analysis capacity.

Specialised competencies such as GIS data processing skills are needed to maintain spatial databases, process the data appropriately, and to calculate certain indicators. GIS skills are relevant to the preceding phases of SUMP development as well. Many technical departments lack GIS expertise or have a single staff member supporting all departments. While consultants can be engaged on an as-needed basis, continuous maintenance and updates to GIS databases will be needed to ensure an efficient monitoring process. Such requirements may need to be included in long-term consulting arrangements if a municipality is unable to manage the data compilation and updating process in-house.

Streamline data provision from national bodies.

To keep up with the pace of biennial reporting, it will be necessary to have a streamlined process in place for local authorities to access the required data in a timely manner and decrease the burden on the Hellenic Statistical Authority (ELSTAT) if each municipality separately requests every data set. The MoIT may consider working with ELSTAT to develop a procedure that provides a single point of access for all local authorities requiring data pertaining to SUMP. Access to certain datasets can be limited to vetted stakeholders if there are concerns about privacy. Without some simplification and acceleration of the current data request process, the burden of data collection is expected to hinder the ability of local authorities to monitor on a biennial basis. Existing platforms should be leveraged wherever possible to reduce redundancies and enable more efficient data sharing and data acquisition by local authorities.

Establish data reporting requirements for transport service providers.

To adequately evaluate progress towards objectives and to evaluate whether transport measures are having their desired impact, regular access to data will be vital. Data reporting agreements with transport service providers (including public transport, taxis, shared mobility, etc.) should be formalised to ensure consistency and quality in what is being shared. The requirement to report data should be incorporated into licensing agreements so that payment or license to operate is contingent on compliance with the data reporting requirements. Mandated data reporting should be linked to explicit public policy objectives and authorities should explain why reporting is necessary for meeting the objectives. The purpose for which the local authority is collecting the data should be outlined clearly, publicly, and with reference to the legal basis for data collection.

Provide national-level guidance on household surveys.

Given the importance of tracking modal shares as part of the SUMP and TEN-T regulations, it would be appropriate to establish a regularly administered household survey. For consistency, the design of the survey should be overseen by the MoIT with the support of research institutions. Each regional authority should then coordinate the survey deployment (which may include a public tender for the process), analysing the data, and sharing it with relevant stakeholders (e.g. municipalities and their consultants, metropolitan transport authorities). Regions have more resources than municipalities and by administering it at this level, can capture the inter-urban trips and travel patterns from areas surrounding municipalities.

Standardise data collection and indicators at the national level.

For the SUMP platform to provide meaningful insights for local authorities on their mobility measures and allow benchmarking, the onus will be on the national authority to standardise data collection practices and indicators, with consideration of TEN-T indicators alongside national requirements, when they become available. This approach can also help to integrate the use of indicators in the public administration process and normalise the sharing of data amongst authorities and private entities involved in SUMP delivery. As part of this project, ITF proposes an indicator framework to support the national government in developing a system to monitor progress of urban mobility objectives at the local level.

Recommendations to understand and monitor urban freight activity

Cooperate with freight stakeholders to address data gathering challenges.

To understand freight activity, authorities need to collaborate with stakeholders who generate or have relevant data. This includes data on transport demand, service supply, infrastructure availability, and freight vehicles. Stakeholders could include freight carriers, receivers, driving training centers, and research institutions. There is currently no legal requirements for stakeholders to share data with authorities, therefore convincing carriers and receivers to share data requires demonstrating clear benefits and establishing trust. This can happen through regular dialogues with local chambers of commerce to facilitate discussions about data sharing benefits, conditions, and concerns. Freight carriers can be willing to share data if certain conditions are met (e.g. clear personal benefits, clear data usage framework, data security, adequate aggregation level, and ease of data provision). Authorities need clear partnership agreements on data sharing with private stakeholders that specify data use, sharing conditions, and format specifications. Furthermore, all data requests should have a legal basis and pertain to public policy objectives.

Use surveys to collect freight data for indicators.

Given the current lack of data, monitoring and evaluation of the freight sector is not possible without the generation of new data. This project did not undertake a comprehensive review of all freight data collection methodologies and their applicability to the Greek context. Rather, to minimise the data collection burden, the freight-relevant indicators suggested in the final chapter are designed to rely primarily on data that could be collected via a biennial regional survey targeting freight carriers. The suggested surveys are structured similarly to nationally coordinated household passenger travel surveys. A core set of survey questions could be defined at the national level for consistency with adjustments possible at the regional level.

Sustainable Urban Mobility Plans in the EU: Working towards national SUMP platforms

This chapter introduces Sustainable Urban Mobility Plans (SUMPs) in the context of the EU and Greece. It first chronicles the development of SUMP guidelines in the EU, summarises the technical resources made available at the EU level and describes the status of SUMPs in member states. It concludes with a summary of how the DG REFORM funded project, *Recharge and Refuel: Clean, Smart and Fair Urban Mobility*, supports the creation of a national SUMP platform in Greece.

The history of SUMP regulations and guidelines in the EU

Sustainable urban mobility constitutes one of the EU's key priorities in the transport sector. The topic entered the public debate in the early 2000s. In the decades since, the European Commission has issued several policy documents and guidance to encourage its member states to adopt policies to promote sustainable urban mobility, as illustrated in Figure 1.

Starting in 2001, the White Paper “European transport policy for 2010: time to decide” proposed 60 measures for the reorganisation of the EU's transport policy, with sustainability and reduction of pollution and congestion as the core objectives. The European Commission proposed emphasising exchanges of good practice aiming at better use of public transport and existing infrastructure (COM/2001/370 final).

In 2005, the European Commission introduced the Thematic Strategy on the Urban Environment, which set a standard for environmental policies and sustainable development in European urban areas. The strategy focused on two core actions: guiding integrated environmental management and Sustainable Urban Transport Plans (SUTPs) (COM/2005/718 final). According to the strategy, SUTPs are a set of measures for managing urban mobility that encompass all forms of transportation within a relevant geographical area (TRT, 2010). SUTPs represent a significant improvement over previous approaches to urban mobility as they shift the focus from a short-term, supply-oriented approach to a long-term strategic one that covers urban passenger and freight transport. Integrating land use and transport planning was considered crucial in SUTPs (COM/2005/718 final).

The European Commission in 2007, through the Green Paper “Towards a new culture for urban mobility”, identified concrete actions to form a new approach to urban mobility that integrates economic development, accessibility, environment, and quality of life (COM/2007/551 final).

Two years later, the “Action plan on urban mobility”, the EU's first comprehensive support package on urban mobility, was adopted. This is the first time the term “sustainable urban mobility plan” was mentioned to describe freight and passenger transport plans for urban and peri-urban areas, but no further definition was provided. It proposed to accelerate the uptake of SUMPs in Europe by providing guidance material, promoting the exchange of good practice, identifying benchmarks, and supporting training activities for urban mobility experts (COM/2009/490 final).

The European Commission's 2011 Transport White Paper encouraged the preparation of Urban Mobility Plans (not specifically SUMPs in this case) in cities that exceed a specific population threshold size, which was not determined within the white paper. It advised that these plans should be fully aligned with national standards and based on EU guidelines. The European Commission also proposed that member states

explore whether or not Urban Mobility Plans should be compulsory and/or linked to official funding for regional development (COM/2011/144 final).

In 2013, the European Commission released a communication titled "Together towards competitive and resource-efficient urban mobility". The Urban Mobility Package highlighted the importance of sustainable urban mobility planning and other related areas such as urban freight distribution, urban access regulations, intelligent transportation systems (ITS) solutions, and road traffic safety. The package's annexe provided for the first time a detailed definition and explanation of the SUMP concept, developed in conjunction with planning experts and stakeholders throughout the European Union. This communication also established the ELTIS Urban Mobility Observatory to support national, regional and local authorities to develop and implement SUMPs by sharing experiences, showcasing good practice, and promoting collaboration. It also stated that funding instruments such as European Structural and Investment Funds should be awarded systematically to cities that have developed a SUMP (COM/2013/0913 final). Furthermore, in the same year, guidelines for developing and implementing SUMPs were published by Rupprecht Consult with the support of the European Commission. These guidelines provide local authorities with practical recommendations for implementing urban mobility strategies (Rupprecht Consult, 2013).

The European Commission issued "A European Strategy for Low-Emission Mobility" in 2016, emphasising the urgent need for a fast transition towards sustainable, low-emission mobility. Moreover, the European Structural and Investment Funds, the Connecting Europe Facility and Horizon 2020 made several EU funds available. To facilitate the exchange of best practices and the implementation of new technologies at the local level, initiatives such as the Covenant of Mayors and CIVITAS initiative for cleaner transport in cities were introduced (COM/2016/501 final).

In 2017 and 2018, European Commission published three policy documents which comprise the "Europe on the Move" Mobility Package that have resulted in a broad package of measures and initiatives, expected to promote sustainable urban mobility in the following years. These documents were oriented and organised along three main axes: a) ensuring a safe mobility system, b) operating a 'clean' mobility system, and c) promoting a connected and automated mobility system. They included measures such as: reforming EU vehicle safety standards, improving road infrastructure safety management, developing a new strategy for the deployment of connected and automated vehicles, establishing a digital environment for transport information exchange, creating a competitive battery ecosystem in Europe, further reducing CO2 emissions from vehicles, improving the aerodynamic design of heavy-duty vehicles, etc.(COM/2017/283 final; COM/2017/675 final; COM/2018/293 final).

The European Commission began updating the SUMP guidelines (SUMP 2.0) in 2019 to reflect current mobility, technology, and societal trends. This revision integrated developments such as driverless electric vehicles, new business models like Mobility as a Service, and lessons from the experience of implementing SUMPs since 2013 (Rupprecht Consult, 2019). At the same time, the "European Green Deal" outlined a roadmap to create a sustainable economy in the EU by "turning climate and environmental challenges into opportunities" in all policy areas, including sustainable urban mobility (European Commission, 2019).

The "Sustainable and Smart Mobility Strategy – putting European transport on track for the future" in 2020 also addressed cities and member states to ensure that all large and medium-sized cities that are urban nodes on the TEN-T network implement their SUMPs by 2030. Sustainable urban mobility planning should also include sustainable urban logistics plans for freight (COM/2020/789 final).

The initiative "New EU Urban Mobility Framework" – part of the broader "Efficient and Green Mobility Package" released in 2021 – developed a more direct link between SUMPs and funding instruments. It prioritises projects implemented in the context of a SUMP for funding via the Connecting Europe Facility

work programmes. Horizon Europe, an innovation-focused funding programme, also prioritises cities with SUMP (COM/2021/811 final).

In 2014, the European Commission set up an Expert Group on Urban Mobility (EGUM), which was re-established in 2022 as the New EGUM. The primary objective of the expert group is to facilitate the exchange of information and technical expertise, while also fostering collaboration and co-ordination among member states, including local and regional governments, as well as other relevant stakeholders and the European Commission in the field of urban mobility, particularly sustainable urban mobility planning (C/2022/5320 final).

The European Commission published a proposal for a revised TEN-T Regulation in 2021, "Union guidelines for the development of the trans-European transport network (TEN-T)", which included a focus on urban areas (COM/2021/812 final). It identified over 400 urban nodes for the TEN-T network, 17 of which are in Greece. Once the regulation is adopted, these nodes will be required to adopt a SUMP that covers their functional urban area (including the surrounding commuting zones) and submit annual data to the European Commission on sustainable mobility indicators.

Finally, in 2023, the European Commission issued a recommendation on "National Support Programmes for Sustainable Urban Mobility Planning" which proposed that EU member states should establish National Support Programmes to align SUMP within their countries more closely. It updated the SUMP concept in the annex of the recommendation (Box 1) to include consideration of local circumstances, planning practices and institutional set-ups in line with the principle of subsidiarity. This support programme aims to develop national guidance for urban mobility planning, technical support, and financial support to cities implementing SUMP (C(2023)1524).

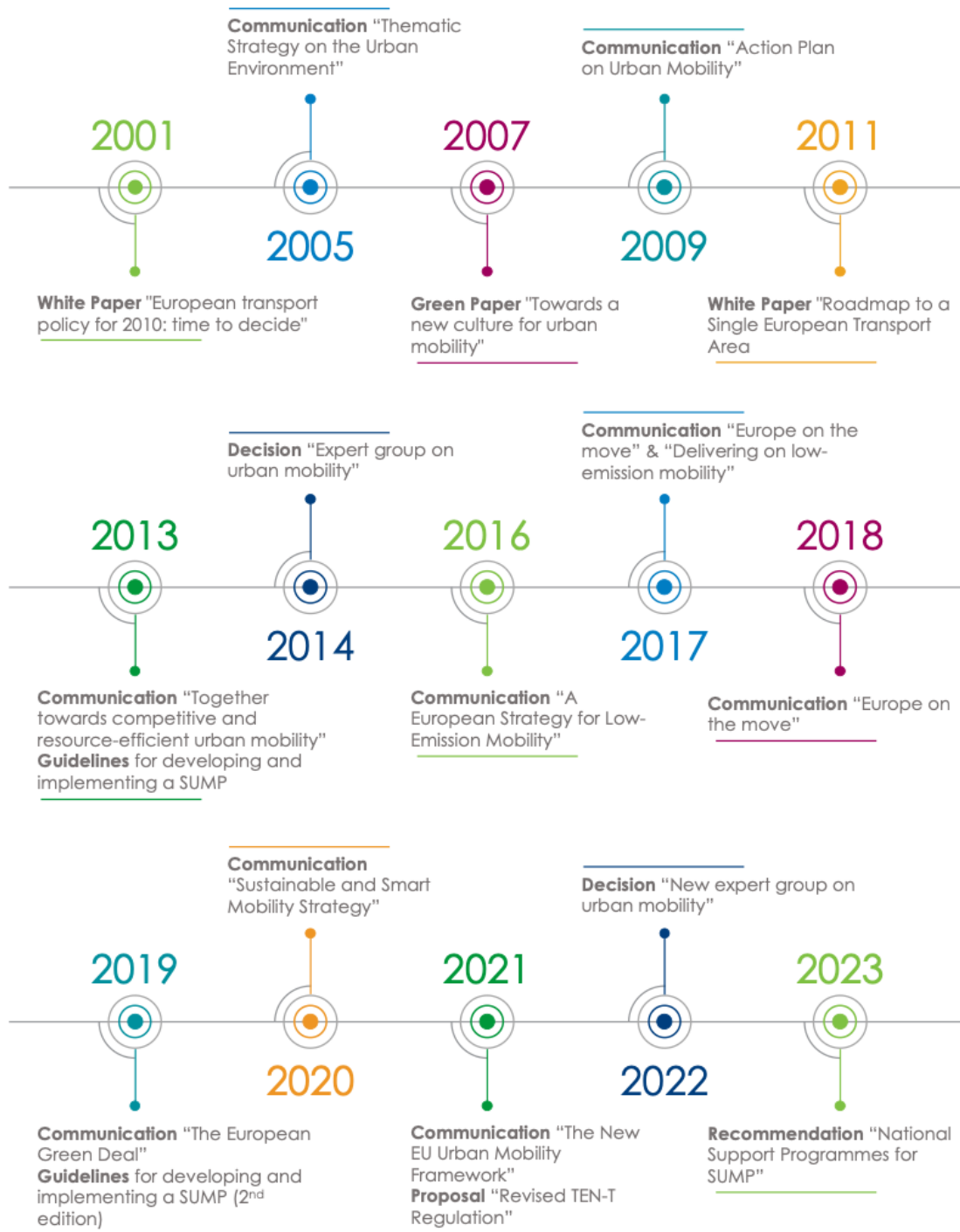
Box 1. Updated concept for sustainable urban mobility plans according to the European Commission recommendation on "National Support Programmes for Sustainable Urban Mobility Planning"

The updated concept lays out guiding principles for the development of all SUMP, regardless of the urban area type. These principles include:

1. Clear and measurable goals and objectives
2. Long-term vision and a clear implementation plan
3. Assessment of current and future performance
4. Integrated development of all modes of transport while prioritising the most sustainable ones
5. Integrated approach to passenger mobility and urban freight transport and logistics
6. Participatory approach with other relevant initiatives
7. Monitoring, review, reporting and quality assurance
8. Guidance and support at European level

Source: (C(2023)1524)

Figure 1. Primary policy documents adopted by the European Commission in the field of sustainable urban mobility



EU’s technical resources for implementing sustainable urban mobility

The European Commission supports the production, processing, and dissemination of sustainable urban mobility planning knowledge. Two editions of SUMP guidelines and complementary documents have been published. The European Commission has initiated various networking initiatives to support sustainable urban mobility initiatives.

EU SUMP Guidelines

With the European Commission’s support, guidelines for developing and implementing SUMPs were developed in 2013, and the second edition of the European SUMP Guidelines was published in 2019. The guidelines provide a comprehensive step-by-step description of the SUMP implementation and co-creation process. In addition, it offers associated activities, aims, task descriptions, guidance on timing and co-ordination, and how to address the involvement of regional and national government structures that delineate the legal frameworks within which a SUMP functions. The information is aimed at EU member states more generally and is not specific to a specific country’s governance structure.

Developing and implementing a SUMP is represented using the visual metaphor of a clock face (Figure 2). The SUMP cycle consists of four phases with each phase beginning and ending with a milestone, and each phase subdivided into three steps, resulting in a total of twelve steps that are further broken down into 32 activities (Rupprecht Consult, 2019).

Figure 2. The 12 Steps of Sustainable Urban Mobility Planning (Guidelines 2nd Edition)



Source: Rupprecht Consult. (2019):31

The update of SUMP guidelines included the development of complementary guides and briefings on specific aspects of SUMPs. These documents elaborate certain planning aspects in more detail (e.g. institutional co-operation), advise on applying SUMPs to particular contexts (e.g. metropolitan regions), or provide guidance for concrete policy fields (like road automation or safety). Currently, there are 21 Topic Guides and 8 Practitioner Briefings available.

EU sustainable urban mobility networks and support tools

A number of European networks exist to support local authorities in the context of promoting sustainable urban mobility. The EU funds various support tools and activities through these organisations to assist cities and regions in integrating sustainable mobility planning and solutions.

The Eltis Urban Mobility Observatory, financed by the Directorate-General for Mobility and Transport of the European Commission, provides local authorities with information, good practice, tools, training materials and communication channels to foster sustainable urban mobility (European Commission, 2022c).

POLIS is a network of European cities and regions that collaborate to develop innovative local transport technologies and policies. POLIS also facilitates the exchange of experiences and knowledge transfer among its members. POLIS membership is available to all local and regional authorities within Europe, and non-EU countries, as well as their transport authorities, mobility agencies, and local public transport organisations (POLIS, n.d.).

In addition, the European Commission launched and co-funds the CIVITAS National Networks (CIVINETs), whose primary role is raising awareness, capacity building, providing funding opportunities and supporting local authorities in implementing sustainable mobility measures and supporting governments in the appropriate adaptation of the EU legislation to the respective national contexts. CIVINETs are formed by local and regional authorities, ministries, governmental organisations and academic and scientific institutions that promote the CIVITAS approach. CIVITAS, launched in 2002, is meant to aid the European Commission in achieving its mobility and transport goals, which align with those in the European Green Deal. These networks are differentiated by region and clustered by language. CIVINET members work together to engage at both European and national levels on transport policy, legislation, and funding (CIVITAS, n.d.-c). CIVINET Greece-Cyprus is the Greek-speaking local network of CIVITAS, which focuses on the promotion of Sustainable Mobility in Greece and Cyprus (CIVITAS, n.d.-a). CIVITAS initiatives, such as SUMP-Up, Prosperity, SUITS, and others, support local partnerships to implement and test novel urban mobility approaches in actual conditions (CIVITAS, n.d.-b).

URBACT, a European exchange and learning programme, promotes sustainable urban development, including urban mobility and sustainable urban mobility planning, by exchanging and building capacities of local authorities. The URBACT IV program, a part of the 2021-2027 European Regional Development Fund (ERDF), prioritises digital, green, and gender-equal policymaking. (URBACT, n.d.).

EIT Urban Mobility is an initiative launched by the European Institute of Innovation and Technology (EIT) which aims to accelerate the transition towards a sustainable mobility system and improve liveability of urban spaces. To achieve this, the initiative focuses on sharing good practice and experiences, disseminating knowledge, and developing and testing solutions for the mobility with industry and academia by using cities as “living labs” (EIT, n.d.).

Lastly, to implement the EU Urban Mobility Framework, DG MOVE launched the new Expert Group on Urban Mobility (EGUM), of which the Hellenic Ministry of Infrastructure and Transport is also a member. The platform includes representatives from organisations, cities and regions, and member states. Their

mandate is to respond to and advise on EU mobility policies, strengthening engagement between member states, cities, regions and other stakeholders on mobility issues (C/2022/5320 final).

Supporting Greece's national SUMP platform

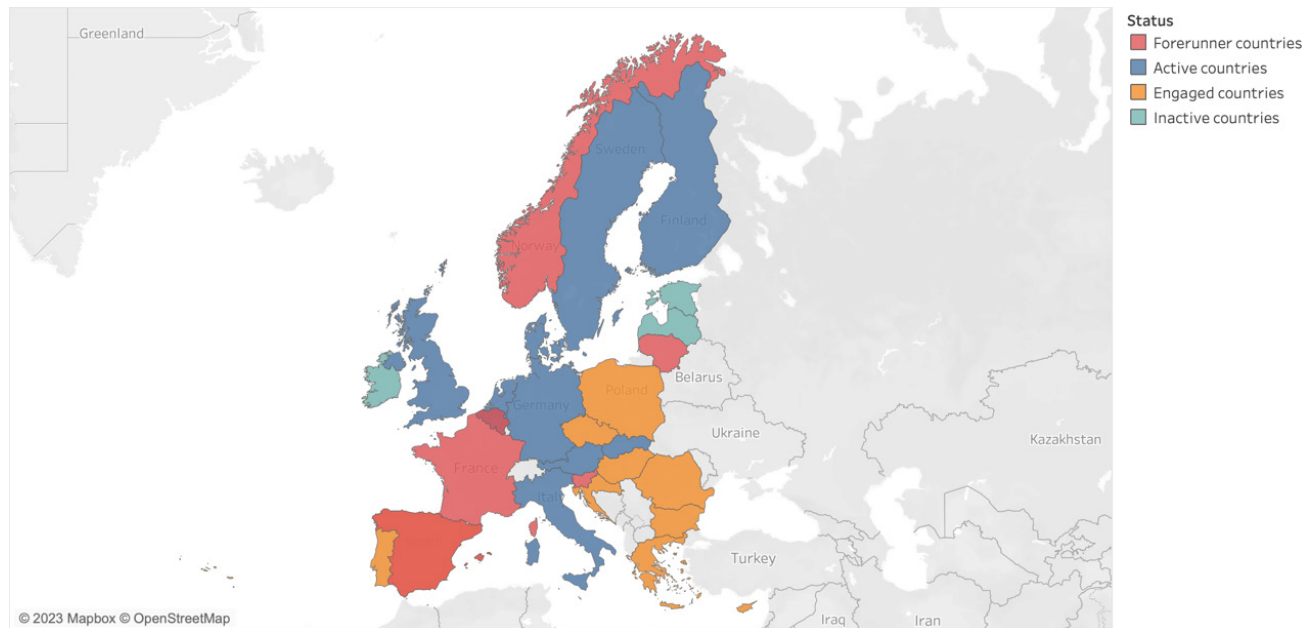
Since their introduction in 2013, SUMPs have been a cornerstone of the EU's urban mobility vision. In line with the EU principle of subsidiarity, urban mobility is managed locally, and no EU regulations or directives directly influence it. The official SUMP guidelines are not legally binding. As a result, the implementation of SUMPs between and within member states remains uneven. Among cities that do have a SUMP, the scope and ambition varies significantly.

Although the EU provides official guidelines and resources, many countries have developed their own guidance based on these guidelines, tailored to their context and in their national language (Werland, 2020). In 2018, the PROSPERITY project, funded by CIVITAS, identified the following four classes of countries and regions with respect to their progress on legal and regulatory frameworks for SUMPs which are depicted in Figure 3 (Plevnik et al., 2018):

- Forerunner countries and regions (18%), such as Belgium and France: they have developed a well-established urban transport planning framework that incorporates SUMPs (or equivalent documents); municipalities are strongly supported by the national/regional level
- Active countries and regions (42%), such as Austria and Germany: they also have a established urban transport planning framework that incorporates SUMPs (or equivalent documents), but support from the national or regional level is partial or non-systematic
- Engaged countries and regions (30%), such as Croatia and Greece: in recent years, these countries have managed to develop an urban transport planning framework that incorporates SUMPs (or equivalent documents); municipalities do not receive support from the national/regional level
- Inactive countries and regions (10%), such as Estonia and Ireland: they are moving towards a sustainable urban mobility planning approach with few or no examples of SUMPs.

While the PROSPERITY project does not mention it, in 2016, a funding programme for SUMPs via The Green Fund was established and a training programme for local authorities was developed in 2017 in collaboration with Jaspers. The MoIT established the unit of Sustainable Urban Mobility within the ministry in 2017 as well.

Figure 3. Status of SUMP National Framework in Europe based on the PROSPERITY project in 2018



Overcoming differences among European cities, requires strengthening governance and ownership at the national level through state-specific SUMP legislation and a support framework to align SUMPs, taking into account local circumstances. As proposed by the European Commission recommendation on “National Support Programmes for Sustainable Urban Mobility Planning” in 2023, national legislation is one of the most crucial factors for developing sustainable mobility policies in cities (C(2023)1524). To this end, each member state should establish a national SUMP support programme to encourage and help municipalities develop and implement SUMPs. Through these national programmes, local authorities can share good practices, receive the necessary support from nationally vetted resources on every step of the SUMP process, secure funding for its implementation, and learn how to monitor the impact of SUMPs in their local area. National governments can also more easily evaluate progress towards mobility objectives with an aligned SUMP process among their local authorities.

Greece preceded this recommendation with the development of its own national SUMP law in 2019, later updated in 2021. This EU-funded project, *Recharge and Refuel: Clean, Smart and Fair Urban Mobility*, implemented in collaboration with DG REFORM, provides technical assistance to the Ministry of Infrastructure and Transport as it establishes a national SUMP support programme. More specifically, the project outputs include:

- The “Sustainable Urban Mobility Measure Selection Tool for Greece”: An educational, decision support tool designed to aid local authorities in choosing appropriate transport policy measures that fit their specific urban contexts and that help them meet their desired objectives.
- The “Sustainable Urban Mobility Monitoring and Evaluation Tool for Greece”: A tool designed to support local authorities to calculate indicators to monitor their SUMPs using the proposed framework developed by the ITF. The framework, which consists of two indicator systems, was developed to support the MoIT in defining standardised monitoring practices for urban mobility.
- This detailed report.
- A summary report providing the main takeaways of the detailed report.

This detailed report details the state of SUMP development in Greece, informed by a comprehensive survey of Greek local authorities, and thirteen online and in-person consultations with a range of local authorities, the MoIT, researchers, consultants, private, and third-party stakeholders. With these inputs and desk research, the report provides an overview of the urban and transport context of Greece, the challenges faced by local authorities in charge of managing urban mobility, and the difficulties associated with data collection, management, monitoring and evaluation. Recommendations are made to address these challenges. The report also provides guidance on using the two accompanying tools to aid in choosing appropriate policy measures to suit individual urban contexts, and how to approach monitoring and evaluation of progress towards mobility objectives as well as the effectiveness of individual mobility measures.

How has Greece implemented SUMP?

Triggered by the growing interest in sustainable urban mobility issues, a number of cities in Greece initiated the development of SUMP in 2014 (European Commission, 2022a). At that time, there was no national legal framework in place to mandate and guide local authorities to develop and implement SUMP. These plans were produced voluntarily; many relied on the Eltis SUMP guidelines, though not all phases, steps and activities were necessarily followed (European Commission, 2022a). Law 4599/2019 (and specifically Article 22) was introduced a few years later to set up a uniform method of developing and implementing SUMP throughout Greece (European Commission, 2022a). While this first SUMP-related legislation was not very detailed, it set the basis for standardising some procedures regarding the elaboration, examination and monitoring of SUMP (FEK 40/A/04-03-2019). To further establish a consistent and concrete national path for SUMP in Greek cities, Law 4784/2021 (Articles 1 to 14) was introduced two years later, in 2021 (European Commission, 2022a).

The Greek SUMP Law (Law 4784/2021)

Law 4784/2021 adopts the widely accepted definition of SUMP as outlined in the Eltis guidelines. It identifies nine (9) primary objectives that local authorities should meet through their SUMP (European Commission, 2022a; FEK 40/A/16-03-2021):

- the enhancement of public transport;
- the promotion of non-motorised modes such as cycling, walking and micromobility;
- the ensuring of accessibility and security, especially for people with disabilities;
- the promotion of road safety;
- the reduction of car use;
- the development of effective parking management strategies;
- the promotion of electromobility and alternative fuels;
- the improvement of city logistics; and
- the utilisation of new technologies to support multimodal and intermodal transport as well as further improve the use of existing road infrastructure.

According to the same law (FEK 40/A/16-03-2021), SUMP should have a medium to long-term horizon of at least ten (10) years. They can be developed by: a) municipalities or an association of municipalities in the case of a functional urban area exceeding the administrative boundaries, b) regions, and c) an association between a region and one or more municipalities within that region. While the goal of the municipal SUMP is to promote sustainable mobility in urban areas, the regional SUMP are foreseen to consider and co-exist with them, with the aim of analysing the overall impact of major transport infrastructures (e.g. ports, airports, etc.) and introducing policies and measures to better connect them.

The development of SUMP in Greece is mandatory for a) all regions, b) municipalities under the jurisdiction of the public transport authorities of Athens and Thessaloniki (i.e. OASA and OSETh, respectively), and c) all other municipalities with a population of more than 30 000 inhabitants. In this context, all 13 regions and 120 out of 332 municipalities are mandated to develop a SUMP based on the latest population census carried out by the Hellenic Statistical Authority (Hellenic Statistical Authority, 2021). It consists of 72 municipalities falling within the areas of OASA and OSETh responsibility –the vast

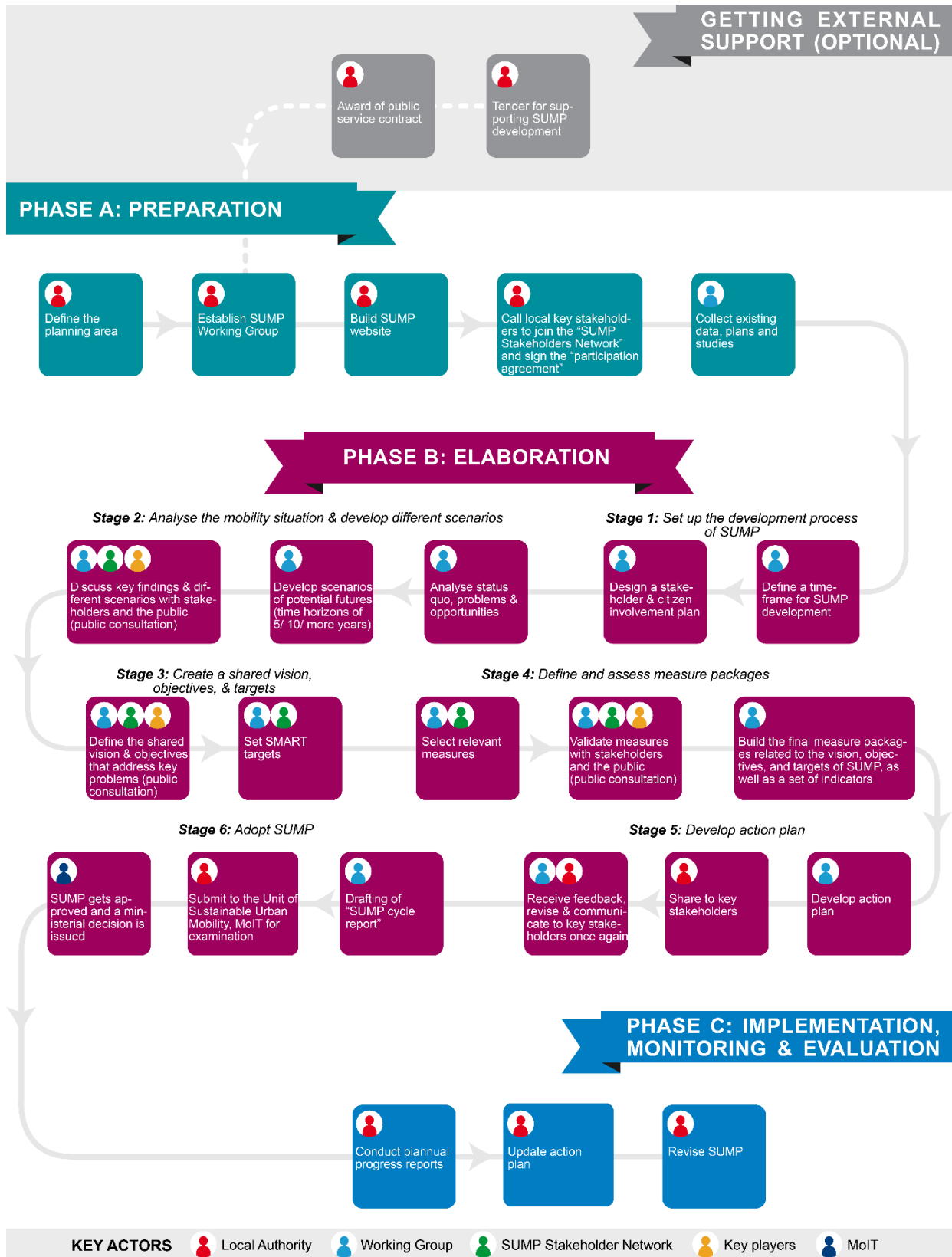
majority (86%) of which also have a population of more than 30 000 inhabitants– and 48 municipalities meeting the population threshold.

In order to facilitate the widespread uptake of SUMPs, Law 4784/2021 identifies the central actors, defines their responsibilities, and describes the sequence of activities to be carried out. The provisions of the law apply to all local authorities that develop a SUMP, regardless of their specific challenges and their transport-related, demographic, socio-economic and geographical characteristics. Figure 4 visualises the process of SUMP development in Greece. Apart from the local authority, which is the competent body, the other main actors involved in the various activities are the Working Group, the SUMP Stakeholder Network, key players (citizens and interested parties), and the MoIT.

- The Working Group is a task force for developing the SUMP. It consists of staff from the local authority and is usually supplemented by consultants who bring their expertise on board. In municipalities where public transport is under the jurisdiction of OASA, OSETh, and Elliniko Metro, staff from these organisations are mandated to participate in the Working Group. In addition, in cases where the municipality developing the SUMP is an island or is close to a port, staff from the Port Authority and the Ministry of Maritime Affairs and Insular Policy are invited to participate in the Working Group.
- The SUMP Stakeholder Network is established by the local authority to serve as an advisory board that supports the Working Group. According to the law (FEK 40/A/16-03-2021), several key local stakeholders should be invited to participate in the SUMP Stakeholder Network, including the neighbouring local authorities, traffic police, public transport authorities and operators, local development agencies, chambers of commerce and trade associations, the academic community, civil society organisations, associations of people with disabilities, etc.
- Key players (citizens and interested parties) are encouraged to be involved in the development of the plan through various online participation tools and at least three public consultation meetings. The goal is to establish a strong foundation for a long-lasting relationship between the local community and the SUMP.
- Finally, the MoIT receives the SUMP cycle report, which describes the SUMP procedure followed, and contains all the core elements of a SUMP, including measures and measure packages, and how they align with the vision, objectives, targets, and indicators, and examines whether everything has been completed properly. Accordingly, the MoIT issues a ministerial decision confirming SUMP's compliance with the requirements of Law 4784/2021. The MoIT is also responsible for the operation of a National SUMP Platform, which has been issued a ministerial decision (FEK 1735/B/19-3-2024). Once established, it will collect and provide open data on Greek SUMPs and their implementation, as well as best practices on sustainable mobility measures (FEK 40/A/16-03-2021). Local authorities will upload their SUMP cycle report, action plan, biennial progress reports and any other relevant information and data to this platform (FEK 40/A/16-03-2021)

As indicated by Figure 4, the Eltis SUMP cycle and its twelve steps are adapted to the Greek context through a number of related activities organised into three phases (FEK 40/A/16-03-2021). The Preparation phase lays the groundwork for SUMP development. Next, the Elaboration phase is composed of six stages including analysing the current mobility situation, defining objectives, choosing measures, developing an action plan and adopting the SUMP (FEK 40/A/16-03-2021). Finally, following the completion of SUMP development, the third phase focuses on implementing, monitoring and evaluating the plan (FEK 40/A/16-03-2021).

Figure 4. The process of SUMP development in Greece according to Law 4784/2021.



Policies, strategies and plans beyond the SUMP Law

Sustainable urban mobility cannot be approached in isolation from other sectors. The relationships between SUMP and other policies, strategies and plans in Greece are illustrated in Figure 5 and further described below.

The development of SUMP takes into account –either explicitly or implicitly– a variety of policy documents, strategies, and plans from three different levels, i.e. the European, the National, and the local.

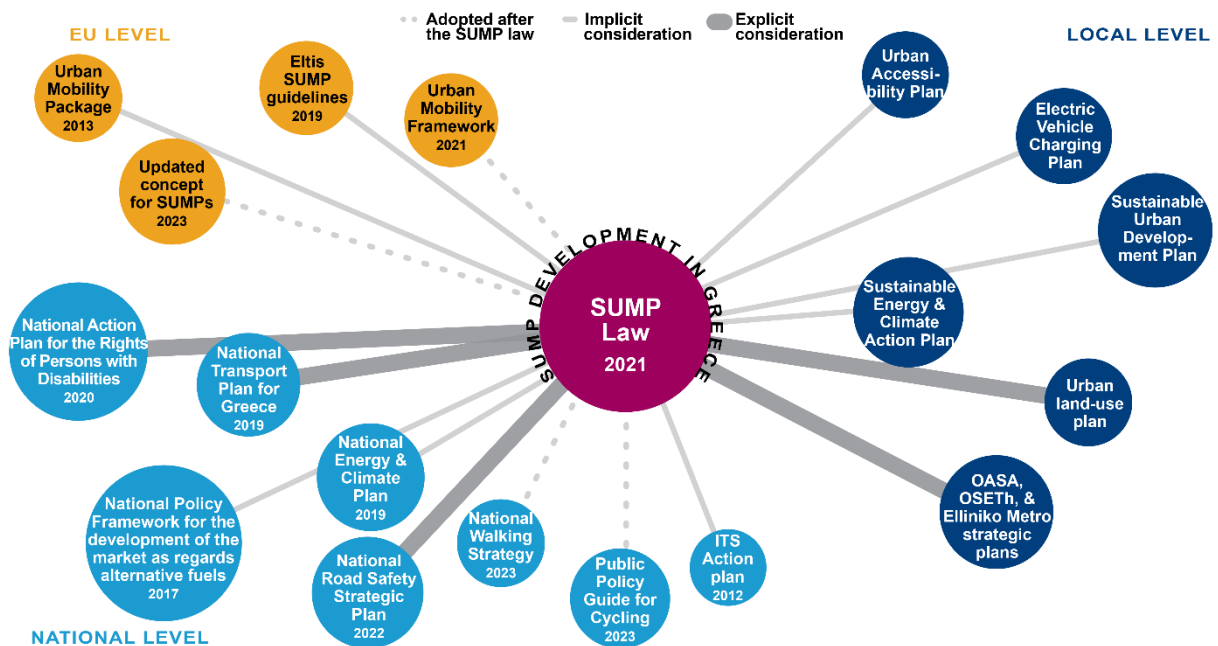
Although the Greek SUMP Law does not refer to specific EU policies, it is aligned with and based on the 2013 Urban Mobility Package and the revised Eltis SUMP guidelines (COM/2013/0913 Final; Rupprecht Consult, 2019). In addition, despite being issued two years before the introduction of the New EU Urban Mobility Framework and the updated concept for SUMP presented in the European Commission Recommendation on national support programmes for sustainable urban mobility planning (SWD/2021/470 final; C(2023)1524), the Greek SUMP Law is generally in line with the provisions of these newer policy documents. The proposal for a revised EU Regulation on "Union guidelines for the development of the trans-European transport network (TEN-T)" requires urban nodes on the TEN-T network to develop a SUMP to ensure the effective functioning of the network. While the Greek SUMP law does not explicitly mention the TEN-T network, the criteria it contains for defining local authorities that must develop a SUMP already include all Greek cities identified as TEN-T urban nodes. Furthermore, while the Greek SUMP law does not explicitly incorporate all the objectives outlined in the recent EU policy documents within its nine objectives, such as the reduction of all sources of transport pollution (i.e. air and noise pollution) and greenhouse gases, improving the quality of life, reallocating public space between modes, creating an attractive urban environment, and serving urban logistics and long-distance flows on the TEN-T network (SWD/2021/470 final; C(2023)1524), the specified nine objectives would contribute to these goals as well.

According to Law 4784/2021, a number of relevant national strategies and plans should be considered when developing a SUMP. These include the "National Transport Plan for Greece" (Egis & Systema, 2019), the "National Road Safety Strategic Plan-Greece 2030" (Ministry of Infrastructure and Transport, 2022), the "National Action Plan for the Rights of Persons with Disabilities" (Hellenic Republic, 2020), the "ITS Action plan" (Ministry of Development Competitiveness Infrastructure Transport and Networks, 2012), the "National Policy Framework for the development of the market as regards alternative fuels" (Ministry of Infrastructure and Transport, 2017), and the "National Energy and Climate Plan" (Ministry of the Environment and Energy, 2019). While the first three are explicitly mentioned in the SUMP Law and the rest are implicitly referenced either through the SUMP objectives or its expected outcomes, there is no explicit obligation for SUMP to incorporate measures that are included in National Plans according to the law. The exception is the National Road Safety Strategic Plan (NRSSP). The MoIT examines if the road safety-related measures proposed in the SUMP action plan align with the NRSSP.

Apart from the above policies and plans, the development of SUMP is also related to two National strategies published after the introduction of the SUMP Law, i.e. the "National Walking Strategy" (Ministry of the Environment and Energy, 2023b) and the "Public Policy Guide for Cycling" (Ministry of Infrastructure and Transport, 2023). These two strategies are expected to interact considerably with the development of SUMP over the following years due to provisions made in the documents. The National Walking Strategy mentions the integration of relevant measures and policies from it into the Greek SUMP guidelines. The strategies also refer to the integration of the measures proposed in the Urban Accessibility Plans into SUMP and financial support to local authorities for implementing bicycle-related measures with a priority to those proposed in the SUMP action plans, etc. (Ministry of Infrastructure and Transport, 2023; Ministry of the Environment and Energy, 2023b).

Finally, concerning the local level, the SUMP law only briefly refers to the urban land-use plans (i.e. General Urban Plans, Open City Spatial and Housing Organisation Plans, Local Urban Plans) of the local authorities and the strategic plans of OASA, OSETh and Elliniko Metro (the public body developing the metro systems in Athens and Thessaloniki) for their respective jurisdictions. However, to ensure consistency, the SUMP law provides that local authorities should also take into account all strategic documents that they consider appropriate to cover the nine objectives, such as the “Electric Vehicle Charging Plan”, the “Sustainable Energy and Climate Action Plan”, the “Urban Accessibility Plan” and the “Sustainable Urban Development Plan”. According to the SUMP Law, the measures included in the SUMP action plan should be consistent with the plans of OASA, OSETh and Elliniko Metro; otherwise, the SUMP action plan should be revised accordingly. Conversely, where SUMP measures conflict with the provisions of the urban plans, the urban plans need to be amended accordingly before these measures can be applied. Regarding the other local plans, the interface between them and SUMPs is rather limited, except for the Electric Vehicle Charging Plans, which reference that relevant measures could be integrated into the SUMP action plan (FEK 4380/B/05-10-2020).

Figure 5. Relationships between SUMPs and other policies, strategies and plans according to the SUMP Law.



Comparing the Greek SUMP Law with other European countries’ laws

To compare the Greek SUMP law with similar laws in other European countries and highlight differences and similarities, the SUMP laws of France, Lithuania, and Italy are examined. The first two countries were selected as typical examples of "forerunners" and the third as "active" based on their SUMP-related legislative maturity, as classified by the SUMPS-UP project (Durlin et al., 2018). The main points and practices found in these three laws are presented below.

France (SUMP Law information: Loi d’orientation Des Mobilités, n° 2019-1428, Year of Publication: 2019)

- SUMPs (“Plans de déplacement urbains-PDUs”) were introduced in France in 1982 to address transport challenges using an infrastructure-based approach. Since then, there have been several legislative improvements to their content and development process, leading to the current version called “Plans de mobilité-PDMs”, which focuses on tackling mobility issues.
- Under the current French law, SUMPs are developed by “Organising Authorities for Mobilities” (AOMs), which are public inter-municipal co-operation structures responsible for organising and developing public transport services and co-ordinating policies within their territory. SUMPs are mandatory for AOMs whose territory of jurisdiction is above 100 000 inhabitants. In France, the obligation to prepare a SUMP applies to a different local authority level than in Greece and in larger areas in terms of population.
- While the local authorities in Greece drive the development of SUMPs, in France, the urban transport authorities lead the process (“Autorité organisatrice de transport urbain”-AOTU). Greece does not have urban transport authorities except for in Athens and Thessaloniki.
- The French law has a similar number of objectives (11) to the Greek law, of which four are general and seven are thematic.
- One of the interesting objectives of French law, which is not explicitly mentioned in Greek law, is to improve the daily mobility of employees. According to French law, companies with at least 50 employees working on the same site should create a travel plan.
- SUMPs in France integrate accessibility plans for roads and public spaces and environmental assessment, including the calculation of carbon emissions and air pollutants. In Greece, on the other hand, these are separate plans and studies.
- While both Greek and French laws mandate the evaluation of SUMPs, the Greek law requires it every two years, while the French law requires it every five years.

Lithuania: (SUMP Law information: Order No 3-586, Year of publication: 2022)

- The Lithuanian law follows a similar approach to the Greek law, in that it does not restrict the development of SUMPs to municipalities only. Instead, it provides that a SUMP may be prepared for a city, a functional area, a municipal area, a group of municipalities, a region or any other designated area.
- On the other hand, unlike the Greek law, the Lithuanian law does not set a population threshold for the municipalities where SUMPs are recommended.
- As a recently introduced legislation, the Lithuanian law explicitly mentions and offers more direct instruction on how the SUMP should align with current EU policies than the Greek law. These include the “European Green Deal”, the “Sustainable and Intelligent Mobility Strategy”, and the “New EU Urban Mobility Framework”. As a consequence, its ten objectives also focus on areas missing from the Greek law, such as the development of TEN-T hub infrastructure.
- For each objective, the Lithuanian law provides a detailed description of the approach to be followed and the analyses to be carried out.
- Similar to the Greek law, the Lithuanian law also provides for the establishment of a digital Sustainable Mobility Data Platform, where data on the status of implementation of SUMP measures, their progress and sustainable mobility indicators will be stored.
- As in the Greek law, the progress towards SUMP objectives should be monitored, but annually rather than biennially.

Italy: (SUMP Law information: Official Gazette No. 233, Year of publication: 2017)

- Similar to the Greek Law, SUMP development in Italy also applies to higher levels of government than municipalities. In particular, the Italian law requires metropolitan areas, provinces (“area vasta”), municipalities and groups of municipalities with more than 100 000 inhabitants to prepare and adopt SUMPs (“Piano Urbano della Mobilità Sostenibile-PUMS”).
- Unlike the Greek Law, which makes no specific reference, the Italian law explicitly distinguishes the role of SUMPs from the traditional urban transport plans (“Piano urbano del traffico-PUT”). Thus, while PUMS are defined as medium to long-term strategic plans addressing mobility problems, PUTs are short-term plans proposing mobility solutions based on existing infrastructure.
- SUMPs are recognised as one of the three administrative tools essential for metropolitan cities to access government funding for the introduction of new mass rapid transit infrastructure.
- Based on the Italian law, the Strategic Environmental Assessment (SEA) is usually involved in the development of SUMPs, but it is not required in every case. Although the SEA is not included as a process in the Greek SUMP Law, it is typically applied to all major transport-related projects.
- The objectives of the Italian law are more detailed than the Greek law. It identifies four themes and 17 mandatory macro-objectives. In addition to the mandatory objectives mentioned above, a set of 15 additional objectives is also included, from which each local authority can choose according to its needs.
- In contrast to the Greek law, the Italian law proposes an extensive list of possible measures and actions for sustainable urban mobility, determined as appropriate for the Italian context. The SUMP platform, which will be developed in Greece informed, in part, by the outputs of this project, will include a number of relevant measures adapted to the Greek context.
- It also provides a detailed indicator system consisting of outcome and output indicators. This matter is also expected to be addressed in Greece through the SUMP platform and the outputs of this project.
- As in the Greek Law, the progress towards the SUMP objectives should be monitored every two years. This monitoring report is typically sent to the National Observatory for Local Public Transport Policy.

The SUMP development state of advancement

Since its introduction by the European Commission’s “Urban Mobility Package” a decade ago (COM/2013/0913 final), the concept of SUMPs has become the cornerstone of European cities’ transition towards attractive, accessible, safe, inclusive, smart, resilient and climate-neutral urban mobility (SWD/2021/470 final; C(2023)1524). Recognising its potential to transform the Greek urban areas, SUMP uptake has been highly promoted in Greece since 2014, with several local authorities already or currently preparing, elaborating or implementing their SUMP.

In order to analyse the state of advancement of SUMPs in Greece, official data was collected in April 2023 from the government portals “Diavgeia” and “Promitheus” that provide open access to all administrative acts, decisions, and contracts made by the public bodies in Greece (Ministry of Digital Governance, n.d.-a, n.d.-b). Specifically, through targeted queries on these portals, all SUMP-related administrative documents were collected, and various data was extracted. This data included information such as whether a local authority had initiated the SUMP process, the involvement of consultants, SUMP development costs, funding mechanism, start and due dates, the duration of preparation and elaboration of the SUMP, and

any requests for extensions to the original timeline. This data was validated and further enhanced with the results of a comprehensive questionnaire survey conducted jointly by the MoIT and the ITF. This survey was carried out online and distributed through the Decentralized Administrations to all Greek local authorities between April 28 and May 19, 2023. Out of 332 municipalities, 109 participated in the survey as well as 3 out of 13 regions, resulting in a significant participation rate of over 30%. The highest participation rates (53% and 47%, respectively) were recorded in Types 1 and 5 municipalities, as defined by the Ministry of the Interior (Box 2). On the other hand, Type 2-4 municipalities had slightly lower rates, ranging from 27% to 33%, while Type 6 municipalities had the lowest participation rate, standing at 17%.

Box 2. Classification of Greek municipalities based on the Ministry of the Interior

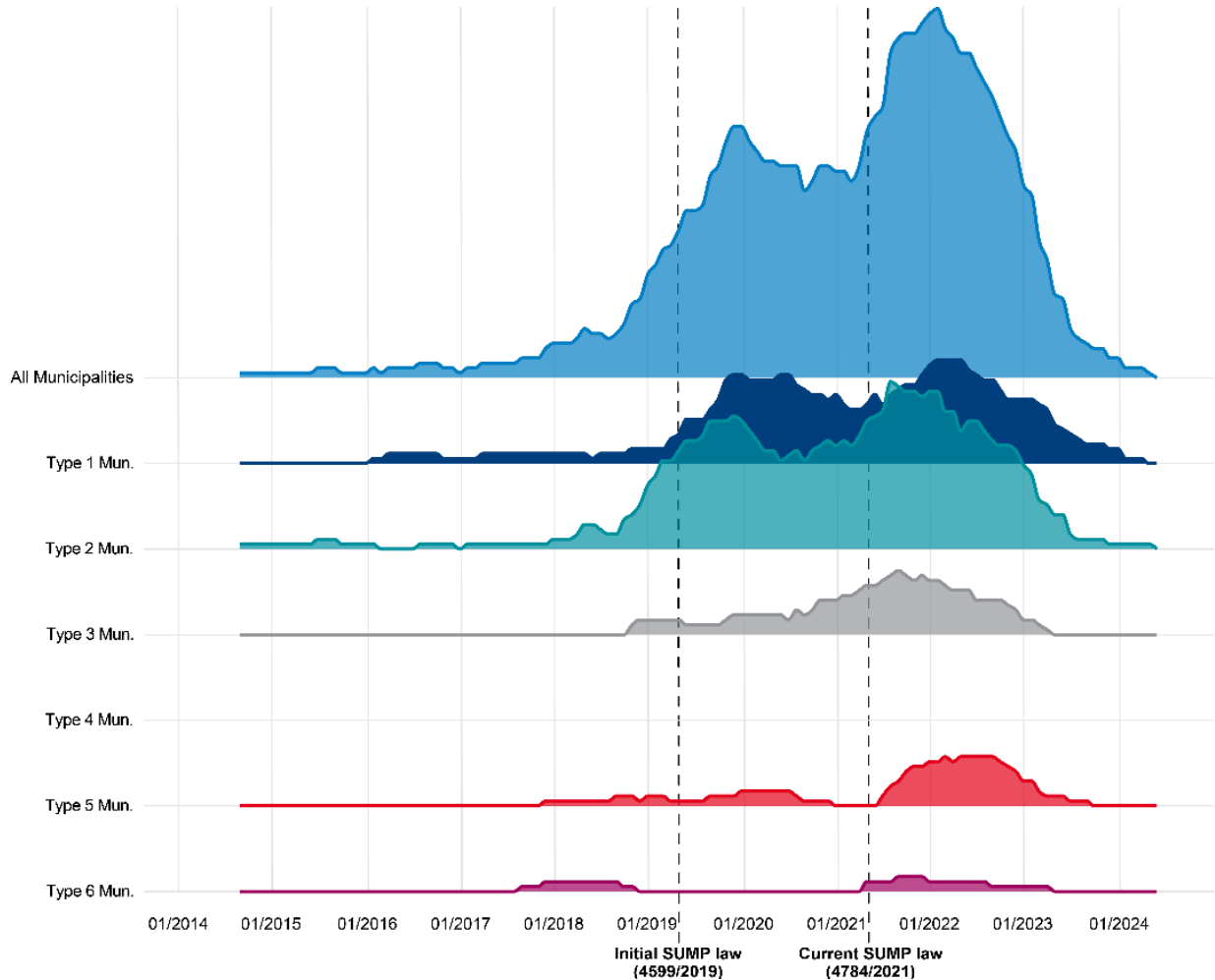
Based on the Cleisthenes administrative reform (FEK 133/A/19-07-2018) that currently is in place, the Greek municipalities are classified into six (6) types:

- Type 1: Municipalities of Metropolitan Centres.
- Type 2: Large Mainland Municipalities and Capital Prefecture Municipalities.
- Type 3: Middle Mainland Municipalities.
- Type 4: Small Continental and Small Mountainous Municipalities.
- Type 5: Large and Medium Island Municipalities.
- Type 6: Small Island Municipalities.

The section, *The urban and regional context in Greece*, in the next chapter provides a detailed introduction to the Cleisthenes administrative reform and the municipality classification system.

Based on these sources, by mid-2023, 173 local authorities had initiated the SUMP process and were in one of the three phases - (i) Preparation; (ii) Elaboration; (iii) Implementation, Monitoring and Evaluation. Based on Figure 6, which presents the evolution over time of the total number of SUMPs being developed (i.e. in the preparation or elaboration phase), about one in four (22% of SUMPs) began development voluntarily before any national legal framework, while the majority of SUMPs was started after the introduction of Laws 4599/2019 and 4784/2021. More explicitly, 39 % of SUMPs were initiated after the first legislation, while an equivalent share launched SUMP processes after the second legislation. Types 1 and 2 municipalities were early adopters in SUMP uptake, being slightly ahead of the others. This may be due to their generally higher administrative and technical capacity, as well as the greater mobility challenges they face. In addition, the development of SUMPs in Greece was at its peak in early 2022. The next turning point is expected to be in early 2024 and beyond, when most Greek SUMPs will be in the implementation, monitoring and evaluation phase.

Figure 6. Ridgeline plot illustrating the evolution over time of the number of SUMP being in the preparation and elaboration phase.



Source: Graph based on data collected in April 2023 from the government portals “Diavgeia” and “Promitheus” that provide open access to all administrative acts, decisions, and contracts made by the public bodies in Greece (Ministry of Digital Governance, n.d.-a, n.d.-b).

All 173 SUMP that have been or are being developed in Greece are driven by municipalities. By mid-2023, none of the 13 regions had initiated the SUMP process, despite it being mandated. During project consultations, there was also uncertainty among regions regarding their responsibilities under the SUMP Law. Three regions were expected to enter the preparation phase by the end of 2023. According to the official government portals (Ministry of Digital Governance, n.d.-a, n.d.-b) no official assignments have been made to external experts for regional SUMP as of April 2024. Thirty-five percent of the 173 municipalities developed their SUMP voluntarily, driven by the desire to improve mobility within their jurisdiction and funding availability. Yet, the majority of the 173 municipalities (approximately 65%) highlight the legal requirement to develop SUMP, in addition to these same reasons. By mid-2023, only seven out of the 120 municipalities (6%) mandated by the law had yet to initiate the SUMP process. A detailed breakdown of the obligation to develop a SUMP and the status quo per municipality type is given in Figure 7.

Figure 7 is a sunburst diagram, with three rings/circles illustrating different attributes. The inner ring indicates the Cleisthenes local authority type, the middle shows the obligation to develop a SUMP, and the outer presents the SUMP status. According to this figure, almost all Type 1 municipalities have complied with the law and initiated the SUMP process. Similarly, most Type 2 municipalities have already developed or are in the process of developing a SUMP, regardless of whether they are mandated or not. It's worth noting that each of these municipalities developed their own SUMP despite being part of larger functional urban areas with mobility needs that go beyond their administrative boundaries. Although the law allows for a joint SUMP to be developed by an association of municipalities, this has not been done so far. As for Types 3 and 5 municipalities, although the vast majority are not mandated to develop a SUMP (95% and 92%, respectively), SUMP uptake has been considerable with 26% of Type 3 municipalities and an even higher 69% of Type 5 municipalities, developing them. As expected, Types 4 and 6 municipalities, which are generally quite small in size and not mandated to develop a SUMP, have the lowest uptake (0% and 14%, respectively). Finally, despite the high uptake of SUMPs, ministerial decisions have been issued for only 31 SUMPs by March 2024 due to delays in submitting the required documentation for SUMP characterisation to the MoIT. These delays are likely due to municipalities operating with limited human resources which does not always allow the prioritisation SUMPs.

Figure 7. Sunburst diagram illustrating the obligation to develop a SUMP and the status quo per municipality type.

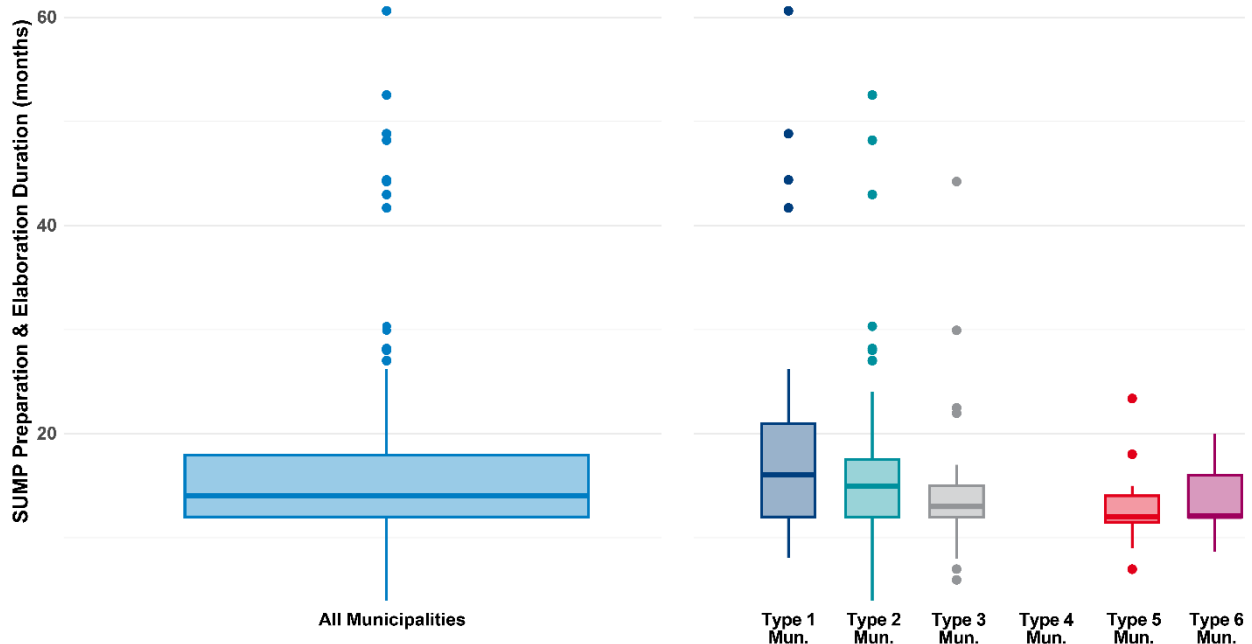


Source: Graph based on data collected in April 2023 from the government portals “Diavgeia” and “Promitheus” that provide open access to all administrative acts, decisions, and contracts made by the public bodies in Greece (Ministry of Digital Governance, n.d.-a, n.d.-b).

According to the survey, the main issues that municipalities hope to address with their SUMP include improving accessibility to shops, jobs, healthcare, and other essential services, improving road safety and reducing traffic congestion. These issues are common to all types of municipalities, regardless of their type. However, there are unique challenges that different types of municipalities face and address in their SUMP, such as the mountainous terrain and sparse population in Types 3-6 municipalities and the dense population in Types 1-2 municipalities. Additionally, many municipalities are affected by large fluctuations in travel demand due to the seasonality of tourist flows, regardless of their type.

Most of the SUMP under development are in the Elaboration Phase in mid-2023, particularly Stages E and F (Figure 4). The local authorities that responded to the survey indicated that Stage D, which involves defining and assessing measure packages, is the most challenging. The average duration of SUMP development (i.e. Preparation and Elaboration phases) amounts to a reasonable period of approximately 16 months, while the median is 14 months. As can be concluded from the boxplots presented in Figure 8, the development of SUMP in larger municipalities requires, as expected, more extensive timelines. As the size of municipality increases, the median values also increase. Approximately 44% of the municipalities who developed a SUMP had to officially revise and extend the timeline. The main reasons for this were the challenges posed by the COVID-19 pandemic, various bureaucratic delays and unexpected difficulties in collecting the necessary input data due to the lack, in many cases, of well-established, effective and efficient data collection mechanisms.

Figure 8. Boxplots of the SUMP Preparation and Elaboration duration



Source: Graph based on data collected in April 2023 from the government portals “Diavgeia” and “Promitheus” that provide open access to all administrative acts, decisions, and contracts made by the public bodies in Greece (Ministry of Digital Governance, n.d.-a, n.d.-b).

As expected, the development of SUMP in Greece relied heavily on the current and previous pieces of legislation (Laws 4784/2021 and 4599/2019, respectively) and the guidance provided by the Eltis Guidelines. The analysis also highlighted that most SUMP factored in other plans, including Urban Land-

use Plans, Sustainable Energy and Climate Action Plans, and traffic/mobility studies. Some of the most recent SUMPs also considered Electric Vehicle Charging and Urban Accessibility Plans. On the contrary, Road Safety and Urban Freight Transport Plans were rarely considered, most likely because these plans are in early stages of adoption and have not been adopted by many municipalities.

When developing the SUMP, most municipalities (over 65%) consulted with stakeholders in policy areas other than transport. Approximately one in five municipalities ensured that the SUMP will be compatible and co-ordinated with strategies related to employment/ economy, climate/ environment and tourism. Co-ordination of strategies proved to be more common at the national and municipal levels than at the European level, although Type 1 municipalities seem to consider this as well. On the other hand, Type 2 municipalities seem to co-ordinate more at the regional level.

In order to facilitate the development of SUMPs, nearly all municipalities brought on board consultants from private firms or experts from universities and research institutes. As reported by approximately 80% of the municipalities, this was mainly due to the lack of personnel or expertise in the field of sustainable mobility. It is worth mentioning that in the case of very small municipalities partially or entirely lacking a technical department, in addition to the consultants/ experts involved in the SUMP Working Group, programme agreements were made with other local authorities, such as the competent Region, to further assist them in developing the SUMP. For example, such a programme agreement was signed between the Region of Thessaly and the Municipality of Alonissos for the latter's SUMP (Region of Thessaly, 2020). While consultants/ experts seem to play a significant role in the Elaboration Phase of SUMPs, the personnel of local authorities largely drive the Preparation and Implementation, Monitoring, and Evaluation Phases with the assistance of the former.

Consultants and experts also seem to play a crucial role in collecting the data needed to assess the current mobility status in SUMPs. Due to the lack of efficient and reliable data collection mechanisms in most Greek cities (Tafidis et al., 2017), local authorities relied extensively on these professionals to gather data for SUMPs. This was usually done during the SUMP development process (e.g. the majority of Type 1 and 2 municipalities conducted household travel surveys as part of their SUMP) or by additional preparatory studies, although this was less common. On the other hand, many smaller municipalities, such as those in Types 3-6, were found to rely mainly on previous and sometimes outdated studies, surveys, or data collected at a higher level, such as national or regional.

Finally, when it comes to developing the SUMP action plan and selecting the mobility measures, the survey analysis showed that most municipalities heavily considered public opinion alongside the official SUMP guidelines. Consultant/ experts' recommendations also played a significant role in decision-making. The most common measures included in SUMPs were those that improve the street space for active and micromobility, urban realm improvements, and pedestrianisation. Regulatory measures such as restrictions and speed limits were also widely adopted. On the other hand, economic measures (e.g. pricing, subsidies, tax incentives, etc.) were included in relatively few cases. Additionally, measures which require the extensive involvement of national or regional authorities, were generally not included in the Greek SUMPs. The main reasons preventing the implementation of these measures in the Greek context are their low level of public acceptance and the existing regulatory framework. Finally, the main challenges faced by the Greek SUMPs in implementing measures appeared to be securing the necessary resources and preparing a detailed budget plan.

Funding and cost of developing SUMPs in Greece

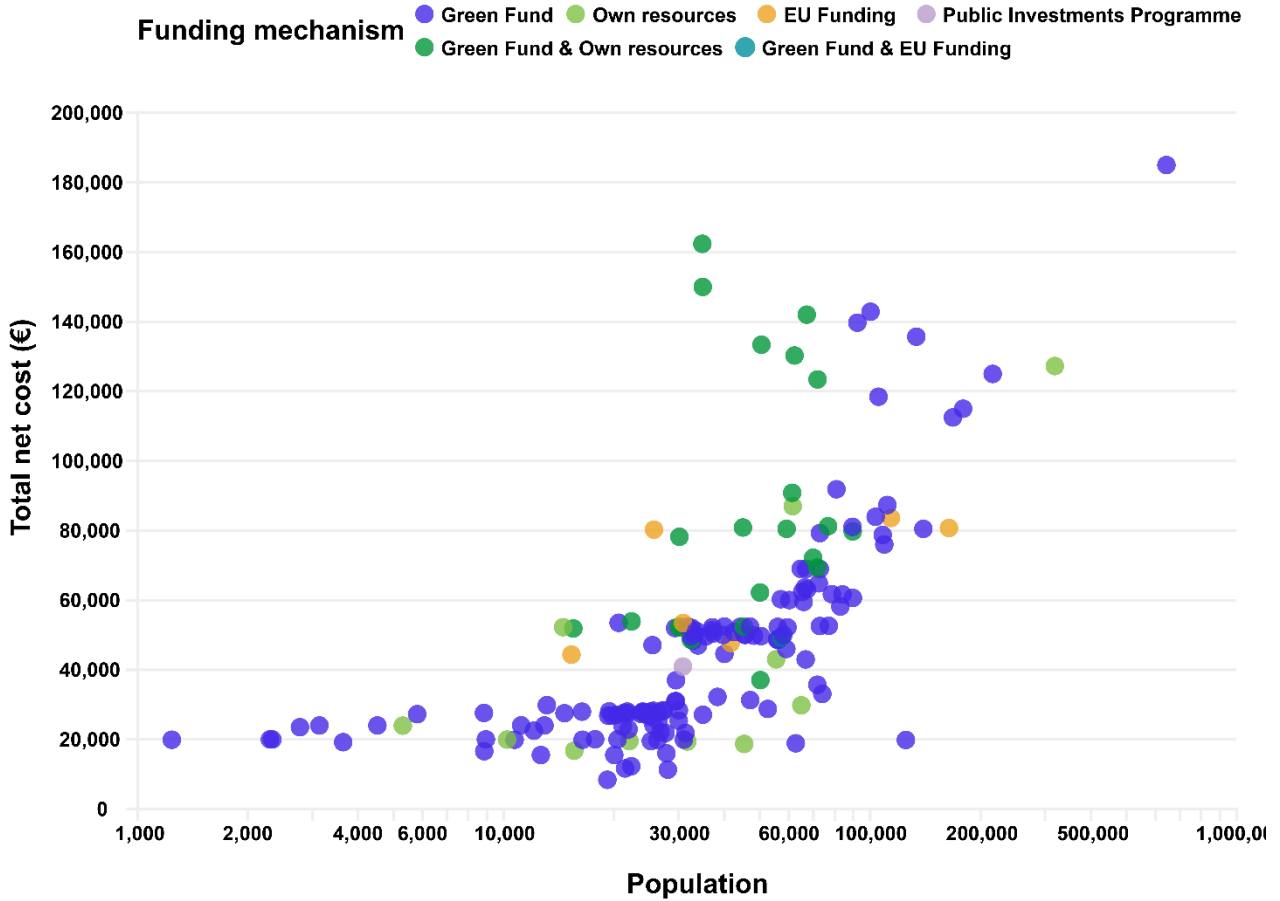
In terms of funding, the Green Fund is the leading stakeholder in supporting the development of SUMPs in Greece. The Green Fund is a public body operating under the Ministry of Environment and Energy that aims to promote sustainable development by providing administrative, technical and financial support to public authorities (Prasino Tameio, n.d.).

Specifically, 76% of the SUMPs already developed or in the process of being developed were funded exclusively by the Green Fund, 13% were jointly funded by the Green Fund and local authorities' resources, while the Green Fund and the EU jointly funded less than 1%. Of the remaining SUMPs, 6% were solely financed by local authorities' resources, nearly 4% were supported exclusively by EU funding and the Public Investments Programme funded less than 1%.

The average total net cost of developing a SUMP in Greece is approximately EUR 50 700, while the median value equals nearly EUR 48 390. As indicated in Figure 9, the maximum cost highlighted among the 173 SUMPs is EUR 185 000 corresponding to the Municipality of Athens, while the minimum cost seems to be EUR 8 400 corresponding to the Municipality of Messini. Furthermore, the total net cost of developing SUMPs generally is around EUR 20 000 for smaller municipalities of up to around 10 000 inhabitants after which the total cost increases with population.

In the majority of cases, the total cost refers exclusively to the cost of hiring external consultants to join the working group and support the local authority in preparing and elaborating SUMP. However, in a few cases, additional costs may be incurred. More specifically, for about 6% of the SUMPs developed in Greece, local authorities contracted a second group of external experts, such as the Hellenic Institute of Transport (i.e. a well-recognised research body in the field of transport), to guide the preparation of the SUMP tendering process, assist them in the performance of tasks requiring specialist knowledge such as the development of a traffic simulation model, and support them in monitoring the progress and the quality of the work delivered by the SUMP Working Group during the Elaboration phase. This additional cost amounted to approximately 15% of the total cost, on average. Apart from the above, in 6% of the Greek SUMPs, a second type of additional cost was incurred due to supporting actions and preparatory studies, which amounted to 14% of the total cost, on average.

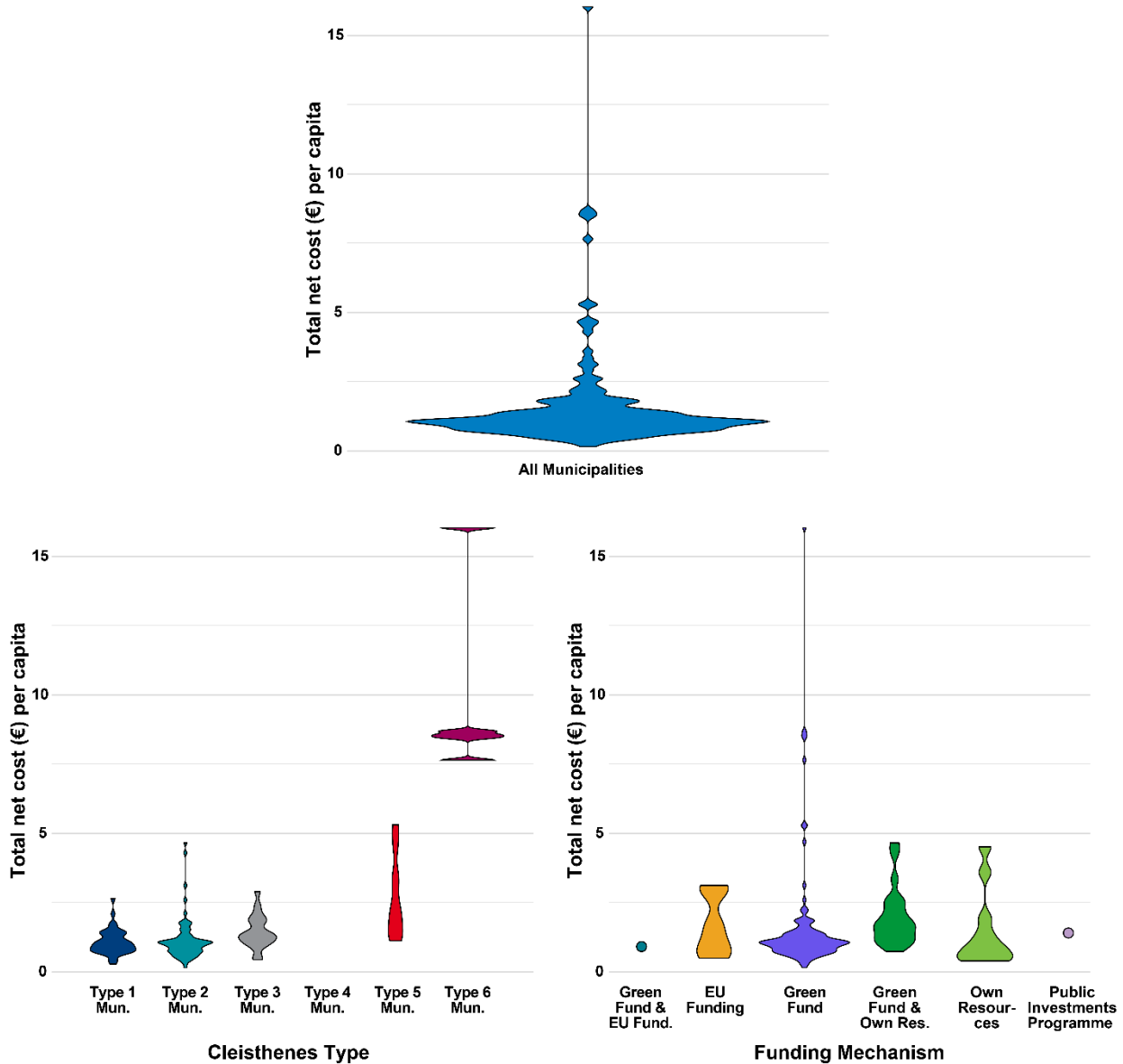
Figure 9. Scatter plot illustrating the relationship between the total net cost for developing a SUMP, municipalities' population, and the funding mechanism.



Source: Graph based on data collected in April 2023 from the government portals “Diavgeia” and “Promitheus” that provide open access to all administrative acts, decisions, and contracts made by the public bodies in Greece (Ministry of Digital Governance, n.d.-a, n.d.-b).

Figure 10 shows the distribution of the total net cost per capita for SUMP development in Greece using violin plots. As can be concluded from this figure, the total net per capita cost of developing SUMPs in Greece was, in the vast majority of cases, less than EUR 2.50, with an average of EUR 1.57 and a median of EUR 1.10. This is much lower than the average net per capita cost in Cyprus, which is EUR 2.64, according to tender data collected from the governmental portal "e-PPS", which is used for the electronic procurement of works, services and supplies (Republic of Cyprus, n.d.). Among the different types of local authorities, municipalities with a very small population, such as those included in Type 6, have a significantly higher total net cost per capita than the others due to a minimum cost underlying the development of SUMPs. Finally, in terms of funding mechanisms, the SUMPs funded jointly by the Green Fund and the local authorities and those funded by the EU seem to have a higher budget per capita than the rest of the SUMPs funded by other mechanisms.

Figure 10. Violin plots presenting the distribution of the total net cost per capita for SUMP development in Greece.



As can be concluded from the above, SUMPs have been strongly promoted in Greece since 2014, with several local authorities already or currently developing their SUMP. While one in four local authorities started voluntarily developing SUMPs before any national legal framework, the introduction of relevant legislation, particularly the current SUMP Law 4784/2021, acted as a catalyst for SUMP uptake. Although some amendments may be considered in the future, this law serves as a solid basis for SUMP development. In addition to the SUMP law, the development of SUMPs in Greece has been heavily supported by the availability of funding, in most cases from the Green Fund. The next critical turning point is expected to occur in early 2024 and beyond, when most Greek SUMPs will be in the implementation, monitoring, and evaluation phase. For local authorities that do not have SUMPs completed, support identifying measures and on data collection and public consultation should be a focus. For those already in the latter stages, the focus should be on guiding and facilitating the application and monitoring of SUMP-related measures.

The urban and transport context in Greece

This chapter provides an overview of the different types of urban areas in Greece, starting with an overview of the administrative typologies, how areas differ with respect to population, size, topographical characteristics, economy, tourism and technical capacity. Next, it outlines the transport services, and the responsible parties for providing bus, specialised services, taxis, rail and road infrastructure. The chapter concludes with challenges experienced by local authorities in sustainably managing urban mobility and the prerequisites local authorities and the national government should consider that will allow for the better management of mobility in the future.

The urban and regional context in Greece

This section describes the administrative structure in Greece, and provides an overview of population, topographical, economic, and tourism trends across regions and municipalities, which contribute to the unique transport challenges and priorities of these areas. It concludes with an analysis of the technical departments of local authorities and the capacity they may have to implement transport interventions.

The evolution of the Greek administrative structure: From Kapodistrias to Cleisthenes

Greece is a unitary state with a two-tier governmental structure (European Committee of the Regions, n.d.). The first tier is the State (national) government, while the second comprises local authorities.

State governance is exercised at both central and decentralised levels. This is mandated by the Constitution of Greece (Article 101), which provides that the administration of the State shall be based on the principle of decentralisation (Constitution of Greece, 2008). The central administrations, i.e. the ministries, have special executive and co-ordinating powers that extend throughout the country. They also provide guidance and verify the legality of the actions taken by the decentralised administrations (Constitution of Greece, 2008). On the other hand, the decentralised administrations, whose heads are appointed by the government, exercise devolved state powers in their respective areas (Constitution of Greece, 2008; FEK 47/A/11-05-2015; Pikramenos, 2023). These include a range of public policy areas such as urban and transport planning, environmental, energy and forestry policy, migration policy and citizenship (FEK 87/A/07-06-2010). The division of the country into decentralised administrations is based on geoeconomic, social and transport factors (Constitution of Greece, 2008).

Local governance is exercised by elected local authorities split between the “first” and “second” levels (Constitution of Greece, 2008). According to Article 102 of the Greek Constitution, local authorities are self-governing territorial entities that manage local affairs and have administrative and financial independence (Constitution of Greece, 2008). Over the last four decades, several laws have changed the distribution of responsibilities and what defines the first and second levels of local government in Greece (Maistros et al., 2022), with “Kapodistrias”, “Kallikratis”, and “Cleisthenes” being the most significant reforms.¹ The Cleisthenes reform applies today and maintains the distribution of responsibilities defined

¹ It is worth mentioning that there is an autonomous, self-governing territory of the Greek state. This territory, which extends to the peninsula of Athos, is commonly known as Aghion Oros and is governed, based on the Greek Constitution (Article 105), by its

by Kallikratis, as described below. The administrative structure of Greece under the Kapodistrias, Kallikratis and Cleisthenes reforms are illustrated in Figure 11.

The Kapodistrias reform, introduced in 1997 by Law 2539/1997 (FEK 244/A/04-12-1997), significantly changed the number of the first-level local authorities in Greece by amalgamating municipalities and communities, reducing their number sharply from 5 775 to 1 034 (Maistros et al., 2022). Under the Kapodistrias reform, 54 prefectures and 13 regions were established and shaped by earlier laws such as 2218/1994 and 2503/1997. The prefectures formed the second level of local authorities and the regions acted as the decentralised level of state governance during this reform (FEK 90/A/13-06-1994; FEK 244/A/04-12-1997; FEK 107/A/30-05-1997). Regions no longer act as decentralised state governance, but rather, local authorities, due to changes introduced by the Kallikratis reform.

In 2010, the Kallikratis reform, introduced by Law 3852/2010, further altered the structure of local authorities in Greece (FEK 87/A/07-06-2010). The aim was to make their operation more effective, efficient, transparent, and accountable and to serve citizens better (Ministry of Interior, 2012). Under this reform, the number of first-level local authorities was further reduced from 1 034 municipalities and communities to just 325 municipalities (Ministry of Interior, 2012). The 54 prefectures at the second level of local authorities were abolished and replaced by the 13 regions (Ministry of Interior, 2012). Each region was divided into smaller non-self-governing areas called regional units, which in most cases, followed the boundaries of the former prefectures. The regional units play an important role in decentralisation within the region by contributing to the smooth delivery of services to citizens throughout the region (Ministry of Interior, 2012). It is important to note that according to the Kallikratis reform, there is no hierarchical relationship and control between the two levels of local authorities, i.e. between municipalities and regions (FEK 87/A/07-06-2010). Instead, they should co-operate and collaborate, as well as enter into joint agreements for co-ordinated actions (FEK 87/A/07-06-2010). This reform shifted more powers and responsibilities to municipalities (e.g. in the fields of environment, quality of life, etc.) and specified the role of the regions (Maistros et al., 2022). Since the regions were no longer the decentralised level of state governance but rather the second level of local authorities, the Kallikratis reform introduced seven decentralised administrations to perform the decentralised duties of the state. These administrations cover the boundaries of one (e.g. Attiki, Kriti) or more regions.

Building upon the Kallikratis reform, the Cleisthenes reform (the current reform) was introduced in 2018 by Law 4555/2018 (FEK 133/A/19-07-2018). The Cleisthenes reform mainly focused on modifying the procedures regarding the election and governance of local authorities (Maistros et al., 2022). The distribution of powers and responsibilities between the state and local authorities stayed largely the same since Kallikratis (Maistros et al., 2022). The structure of the local authorities also largely remained the same (Figure 11), except for the number of municipalities. The Cleisthenes reform divided five former municipalities into 12 new ones, bringing the total number of municipalities to 332.

20 Holy Monasteries (Constitution of Greece, 2008). Given this territory is not required to complete a SUMP, it is not considered in the rest of the analysis/recommendations.

Figure 11. Administrative structure of Greece under the Kapodistrias, Kallikratis and Cleisthenes reforms.

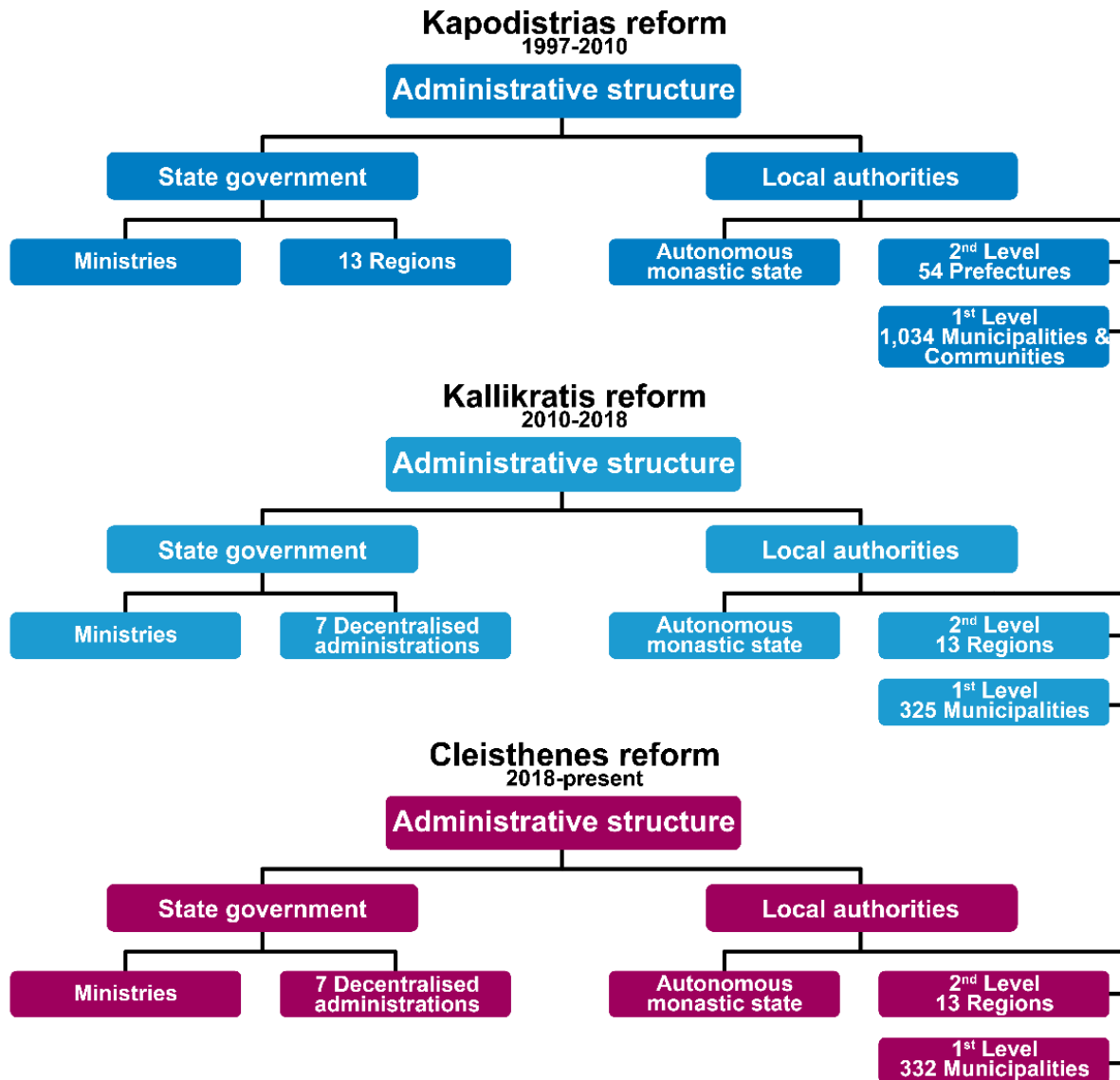
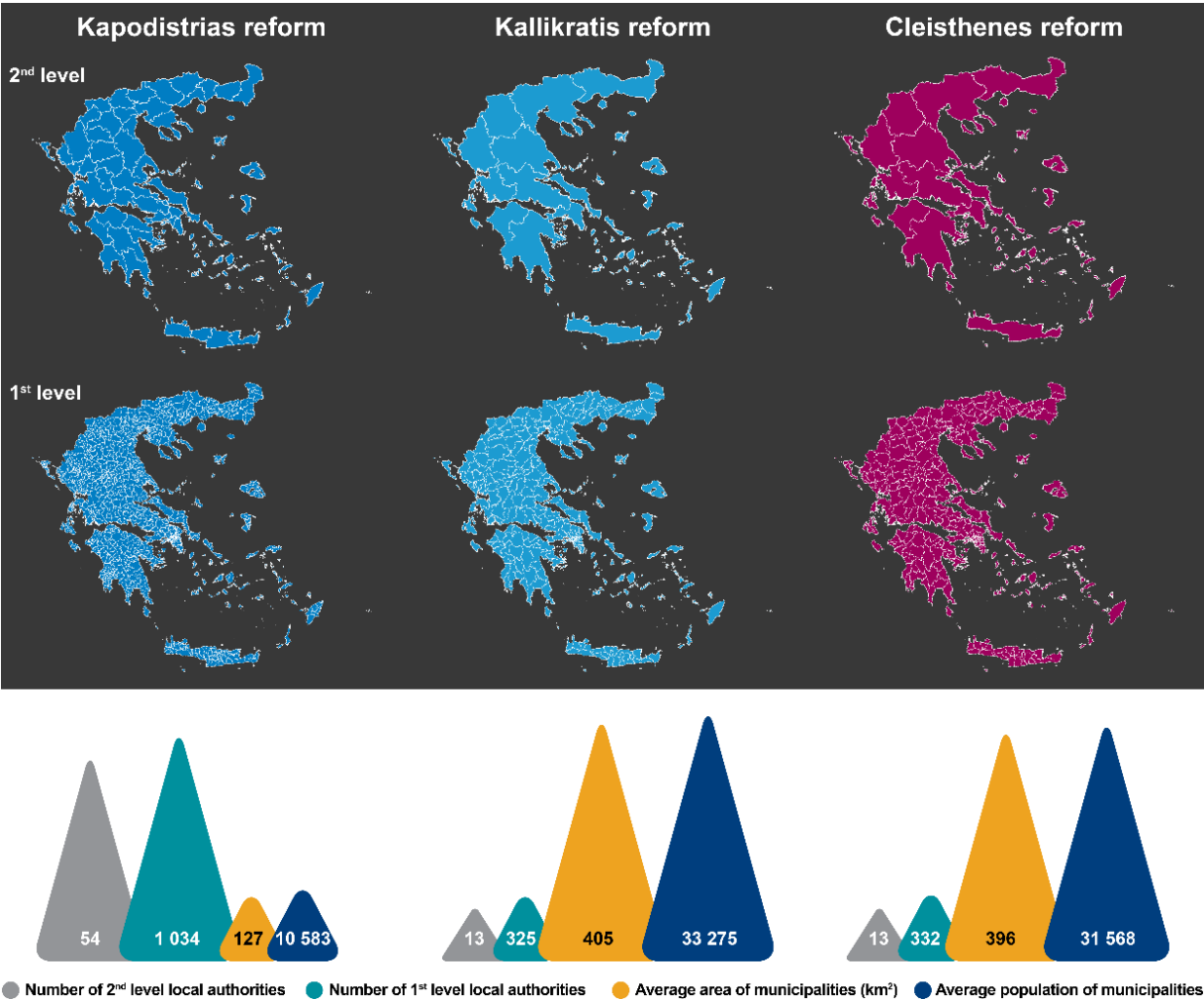


Figure 12 below maps the Greek local authorities under the three major administrative reforms. As can be seen from this figure, the change in the structure and number of municipalities brought about by these reforms, in turn, significantly diversified their characteristics in terms of area and population. More specifically, under the Kapodistrias reform, more than half (53%) of Greek municipalities and communities had a population of 0-5 000 inhabitants (KEDKE & EETAA, 2010). On average, a first-level local authority had a population of 10 583 inhabitants and covered an area of 127 km². On the other hand, under the Kallikratis reform, the majority (59%) of Greek municipalities had a population between 10 000 and 50 000 inhabitants (KEDKE & EETAA, 2010). The average Greek Kallikratis municipality had over three times the population of its predecessor (33 275 inhabitants) and covered an area nearly four times larger (405 km²). Finally, the characteristics of Greek municipalities shaped by the Cleisthenes reform are still comparable to those of the Kallikratis. On average, a typical Greek municipality spans 396 km² and has a population of 31 568. Compared to other EU and OECD countries, the population structure of Greek municipalities is similar to that of Portuguese, Swedish and Israeli municipalities, while their area is comparable to that of Danish and Korean municipalities and the unweighted EU average municipality (EETAA, 2022; OECD, 2021).

Figure 12. Greek local authorities under the three major administrative reforms.



Existing classification of the Greek municipalities

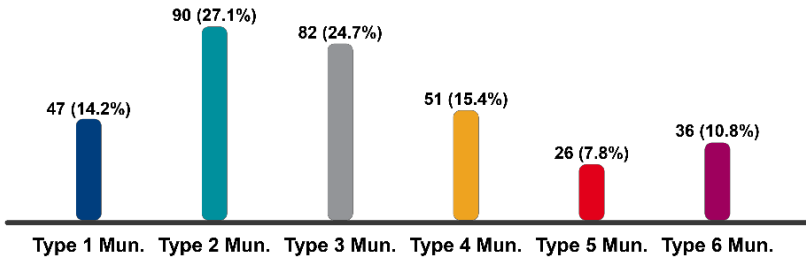
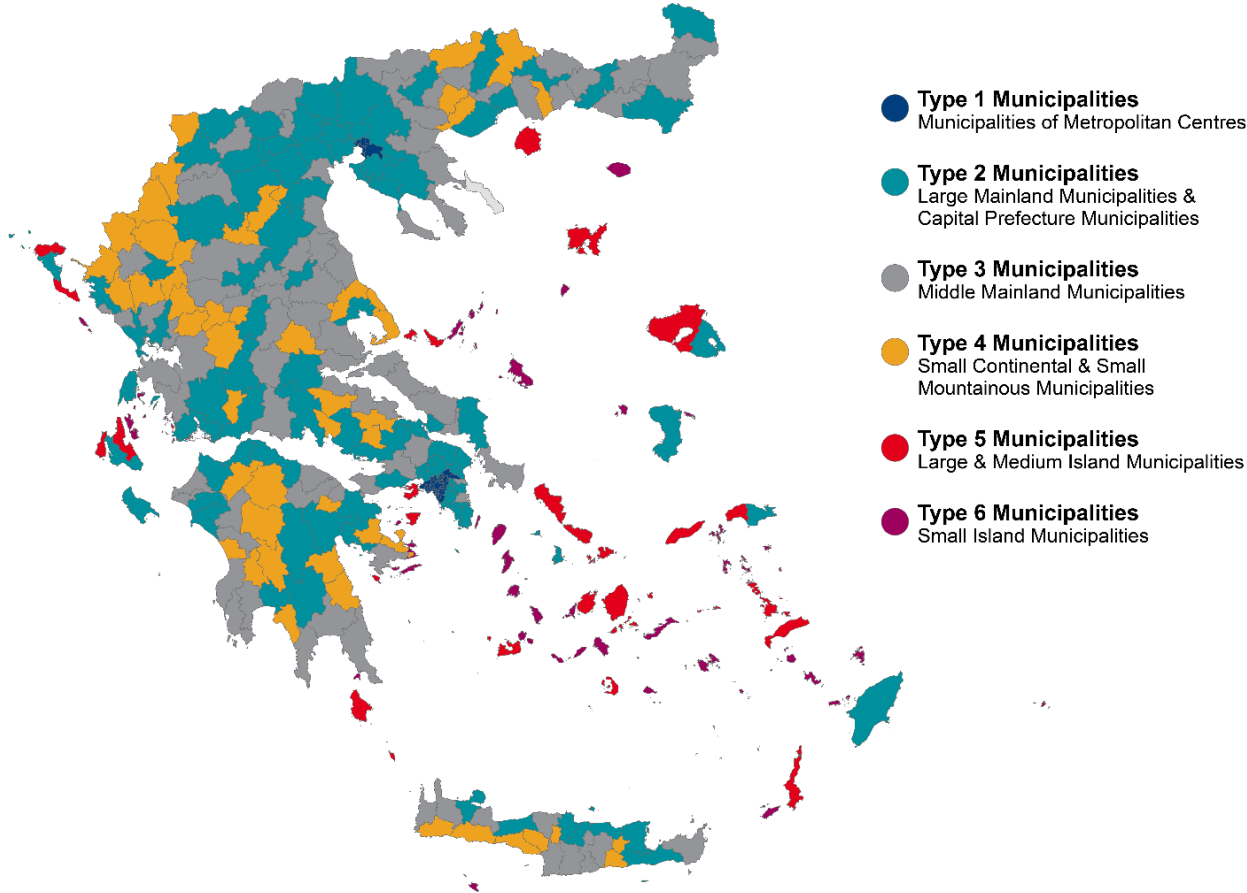
Although the Cleisthenes reform made only minor changes to the structure of Greek municipalities, it established a classification system for them. The main aim of this classification was to facilitate a clear definition of the roles and responsibilities of municipalities based on their specific characteristics, enhance their internal organisation, and ensure a fair distribution of central autonomous funds (i.e. funds granted annually by the state government to the municipalities) and other national or European funding sources (FEK 133/A/19-07-2018).

The Greek municipalities vary considerably not only in terms of population but also in terms of their natural and built environment (KEDE & EETAA, 2022), therefore the Cleisthenes reform took into account various factors to arrive at a classification. These factors included population, geomorphology, economic activity, level of urbanisation, integration or not into larger metropolitan areas, and position within the country’s administrative division (FEK 133/A/19-07-2018). As a result, the following six types of municipalities were identified (FEK 133/A/19-07-2018):

- **Type 1 (Municipalities of Metropolitan Centres).** It includes the municipalities located in the metropolitan areas of Athens and Thessaloniki. Explicitly, it encompasses all the 40 municipalities from the Regional Units of Piraeus, Central Athens, North Athens, South Athens and Western Athens, as well as seven municipalities from the Regional Unit of Thessaloniki. These seven municipalities are Thessaloniki, Ampelokipoi-Menemeni, Kalamaria, Kordelio-Evosmos, Neapolis-Sykees, Pavlos Melas and Pylaia-Chortiatis.
- **Type 2 (Large Mainland Municipalities and Capital Prefecture Municipalities).** It includes a) all mainland municipalities with more than 25 000 inhabitants and b) all municipalities (either mainland or island) that were capital prefectures. Although Crete and Evia are the two largest islands in Greece, they are considered to be part of the mainland in the context of the Cleisthenes classification due to their large population size and area and their territorial continuity, which creates problems of a different scale and development potential compared to the rest of the islands (EETAA & University of the Aegean, 2023). In addition, Evia is connected to the mainland by a bridge. Therefore, the municipalities of the Region of Crete and the Regional Unit of Evia, based on their other characteristics, are included in one of the Types 2, 3 and 4.
- **Type 3 (Middle Mainland Municipalities).** It includes all mainland municipalities with more than 10 000 and up to 25 000 inhabitants.
- **Type 4 (Small Continental and Small Mountainous Municipalities).** It includes all mainland municipalities with less than 10 000 inhabitants.
- **Type 5 (Large and Medium Island Municipalities).** It includes all island municipalities with more than 3 500 inhabitants.
- **Type 6 (Small Island Municipalities).** It includes all island municipalities with less than 3 500 inhabitants.

As can be concluded from the above, the classification introduced by the Cleisthenes reform is easy to use and transparent, the criteria are clear, and each municipality can be included in a single type (KEDE & EETAA, 2022). Moreover, a study utilising factor and cluster analyses highlighted that the Cleisthenes classification is consistent with the main characteristics of Greek municipalities (KEDE & EETAA, 2022). Figure 13 presents the map of the Greek municipalities based on the Cleisthenes classification. This figure shows that Type 2 municipalities represent the largest share (27.1%) for Greek municipalities, followed by Type 3 at 24.7%. Types 4 and 1 have smaller percentages at 15.4% and 14.2%, respectively. Type 5 and Type 6 municipalities have even lower shares, with 7.8% and 10.8%, respectively.

Figure 13. Greek municipalities classified by the Cleisthenes reform.



Population, area and population density of municipalities

Figure 14 presents the area, population and gross population density per type of municipality in the form of a connected dot plot based on data collected from the Hellenic Statistical Authority (2021). More specifically, Type 1 municipalities are the smallest in terms of area, covering an average area of 13.9 km². On the contrary, Type 2 municipalities are the largest, extending more than 574 km² on average. The smallest municipality is Agia Varvara, situated in the Athens metropolitan centre, with an area of 2.1 km², while the largest is Grevena, with an area of 1862.5 km².

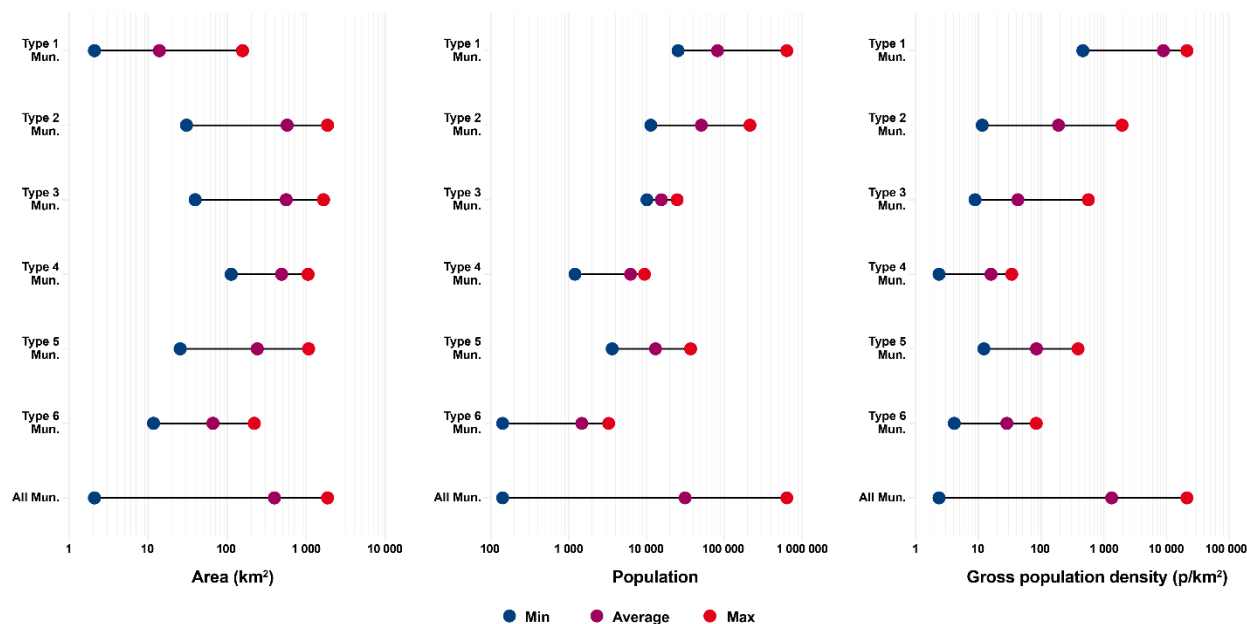
When it comes to population, Type 1 municipalities are the largest, with an average of 82 554 inhabitants, followed by Type 2 municipalities, with an average of 51 152 inhabitants. Type 3 and 5 municipalities are

both medium-sized, with a population of 15 636 and 13 146, respectively. Meanwhile, Types 4 and 6 are similarly small, with an average of 6 271 and 1 481 inhabitants, respectively.

In line with the above, Type 1 municipalities are characterised by relatively high gross population densities, averaging around 8 880 p/km², while Type 2 municipalities follow, with an average of just 189.3 p/km². Type 5 and 3 municipalities have similar low densities, with an average of 84.1 and 42.5 p/km², respectively. Type 4 and 6 municipalities have very low gross population densities, with only 15.8 and 28.3 p/km², respectively. Finally, looking at the extremes, the Municipality of Kallithea, located in the Athens metropolitan centre, has the highest gross population density, slightly exceeding 21 100 p/km². Conversely, the Municipality of Prespes, which falls under Type 4, has the lowest gross population density of only 2.4 p/km².

The high population densities that characterise Type 1 and, in some cases, Type 2 municipalities tend to promote sustainable mobility more effectively. On the contrary, Type 3-6 municipalities are likely to face greater challenges in reducing car dependency due to low population densities.

Figure 14. Connected dot plot illustrating the minimum, average, and maximum area, population and gross population density per municipality type.

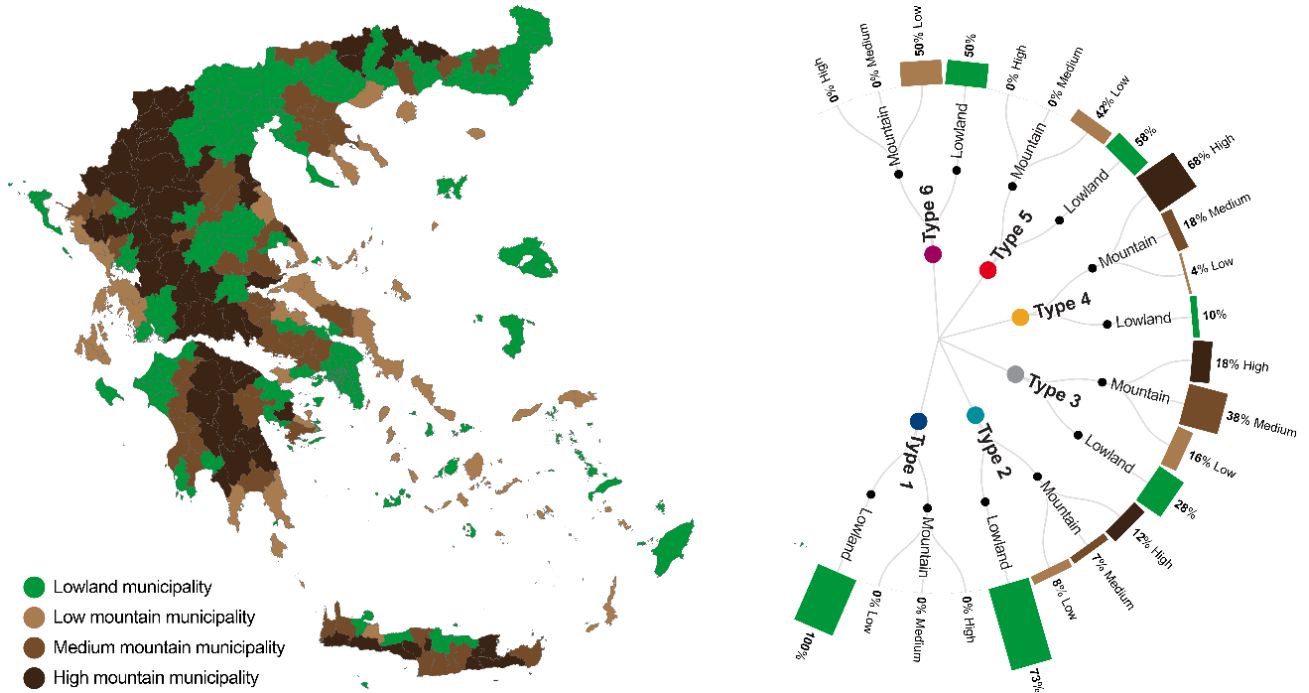


Topographical characteristics of municipalities

Figure 15 illustrates the terrain of the Greek municipalities in a simplified way, based on an analysis conducted by a research team from the National University of Athens (EETAA & National University of Athens, 2023). This analysis adapted the criteria set up by the EU for mountain areas (Eurostat, 2019) to better fit the Greek context. The analysis identified three classes of mountain municipalities: high (elevation over 700 m), medium (elevation between 300-700 m), and low (elevation under 300 m with relatively large local topographical contrasts) (EETAA & National University of Athens, 2023). Municipalities with over 90% mountain area were included in the high mountain class, regardless of their share in the different elevation thresholds (EETAA & National University of Athens, 2023). On the other hand, municipalities with a population density over 85 p/km² or a population of over 50 000 inhabitants were

excluded from the mountain municipalities (EETAA & National University of Athens, 2023). Based on the data presented in Figure 2.5, it is clear that the vast majority of Type 4 and 3 municipalities (90% and 72%, respectively) have mountainous terrain. Similarly, a significant share of Type 6 and 5 municipalities (50% and 42%, respectively) are considered mountainous. In contrast, only 27% of Type 2 and none of the Type 1 municipalities are classified as mountainous. Encouraging sustainable mobility in municipalities classified as Types 3-6 may, in many cases, prove more complex due to the additional mobility challenges posed by the mountainous terrain.

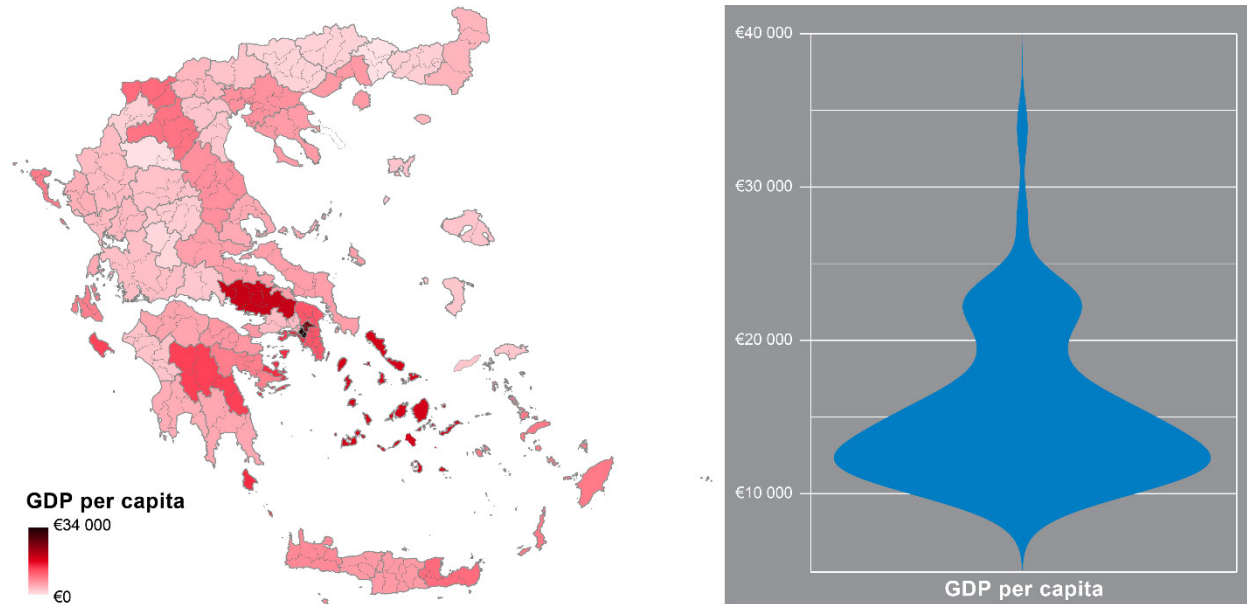
Figure 15. Terrain of the Greek municipalities.



Economic capacity of municipalities

To classify municipalities from an economic perspective, an analysis of the Gross Domestic Product (GDP) per capita was carried out and is presented below (Figure 16). The results illustrated in this figure refer to the year 2019 and are derived from data initially provided by the Hellenic Statistical Authority (2020c) at the level of regional units (NUTS3). Thus, for the scope of the current project, it is assumed that all municipalities within a regional unit share the same GDP per capita value.

Figure 16. GDP per capita across regional units in Greece



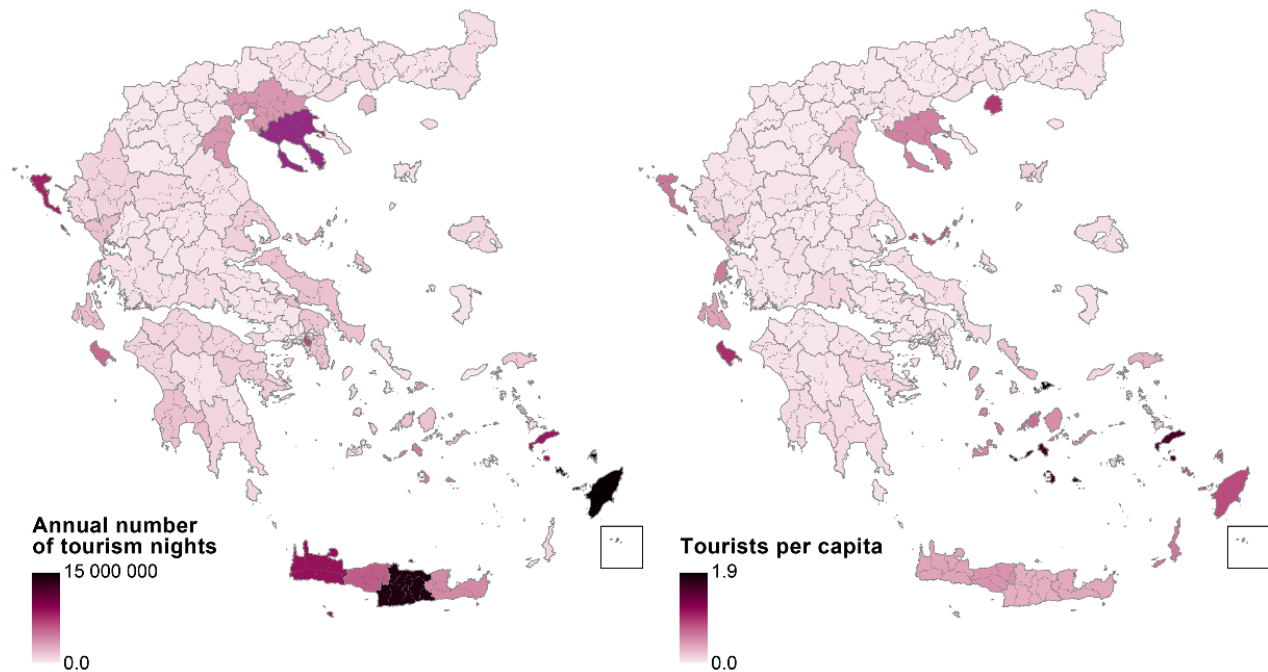
According to Figure 16, the Regional Units of Grevena and Xanthi in Northern Greece and their corresponding municipalities have the lowest GDP per capita (below EUR 10 000). On the contrary, the Regional Units of North and Central Athens and their related municipalities have the higher GDP per capita (ranging from EUR 28 000 to almost EUR 34 000). Given the close relationship between the economy and urban mobility, these high GDP values may imply higher mobility levels and specific challenges for sustainably managing demand. These challenges may include increased private vehicle ownership and use, and therefore, increased traffic congestion levels, stress, and economic losses due to wasted time and fuel, higher levels of air pollutants and greenhouse gas emissions, and increased energy consumption. At the same time, a stronger economy can support the investments needed to shift towards sustainable mobility. Out of the top 15 areas with the highest GDP per capita in the country, nine of them are island municipalities located in the South Aegean. These islands include Andros, Thira, Kea, Milos, Mykonos, Naxos, Paros, Syros, and Tinos. This is mainly due to the significant tourism activity in these areas.

Tourism in municipalities

Tourism is one of the major drivers of the Greek economy (OECD, 2022), impacting the local economies of many areas, both on the islands and the mainland. Based on data collected from the Hellenic Statistical Authority (2022a), approximately 133 million tourism nights were recorded in Greece in 2022. As can be seen from Figure 17, which illustrates the performance of Greek areas in terms of two basic tourism metrics, the top 10 areas accounting for a considerable share of these tourism nights are the Regional Units of Rodos, Irakleio, Chalkidiki, Chania, Kos, Kerkyra, Central Athens, Rethymno, Zakynthos and Thira, and their corresponding municipalities. It's important to note here that tourism data, much like GDP per capita, was initially provided at the regional unit level, and it was assumed that all municipalities within a regional unit had the same performance. In terms of tourists per capita, the islands (municipalities) of Mykonos, Thira and Kos seem to be the main attractors, with the number of tourists exceeding the number of residents during the peak period, or reaching parity, as in the case of Zakynthos and Thasos.

Tourism affects numerous municipalities, regardless of their Cleisthenes type. The temporary yet large increase in the number of people living and moving in high-tourism places poses significant challenges for mobility and raises concerns about the carrying capacity of these areas, as well as the competing priorities of transport services. Transport needs of tourists and locals can sometimes be at odds with each other. The mobility-related challenges become even more complicated when considering tourism seasonality, which is often expressed as the ratio of the number of tourists in the peak month to the average month (World Tourism Organization, 2004). Tourism seasonality ranges from 1.2 to 2.8 in the various Greek areas, with an average of 2.3.

Figure 17. Significance of tourism across regional units in Greece



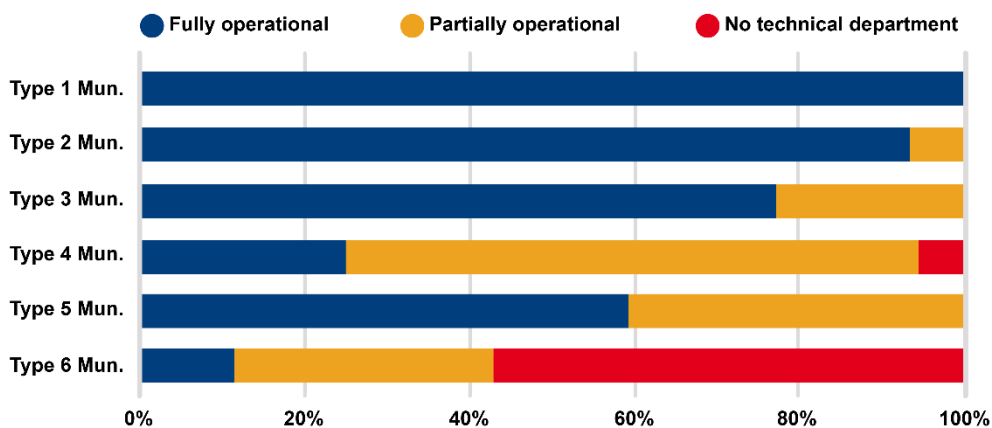
Technical departments of local authorities

Finally, an analysis of the technical departments of the Greek municipalities is presented below. The aim is to gain concrete insights into their capacity to develop demanding policies such as SUMP and to implement challenging transport measures. Based on this analysis, carried out by the Hellenic Agency for Local Development and Local Government (EETAA, 2022), the vast majority (93%) of the 332 Greek municipalities have a technical department, while the remaining 7% do not. Among the existing technical departments, 76% are fully operational, while the remaining 24% are partially supported by another body, such as the technical department of another municipality or the competent region. It should be noted that in the latter case of partial operation, the technical department requires either systematic administrative support from another body or during implementation of specific project (EETAA, 2022). Among the current technical departments, approximately 53% are structured as Directorates, 28% as units operating under a larger Directorate (primarily the Environment Directorate), 12% as independent units, and the remaining 19% as offices (EETAA, 2022).

As can be seen from Figure 18, which presents the results of the analysis per municipality type, all Type 1 municipalities have a fully operational technical department, indicating thus a high-capacity level. Similarly,

most Type 2 municipalities have a fully functional technical department, except for approximately 6.5%, where other bodies support the corresponding technical departments for implementing specific projects (EETAA, 2022). In a similar context, Type 3 and 5 municipalities have, in most cases, fully operational technical departments (77% and 59%, respectively) (EETAA, 2022). In fewer cases, the technical departments are partially functional, requiring support from other bodies for implementing specific projects (23% and 41%, respectively) (EETAA, 2022). On the other hand, the existing organization of technical departments in Type 4 and 6 municipalities indicate a low-capacity level. About 6% of Type 4 municipalities do not have a technical department, while more than 69% require systematic support from other municipalities or the corresponding region (EETAA, 2022). Only a quarter of Type 4 municipalities have a fully operational technical department. In the same vein, around 57% of Type 6 municipalities lack a technical department (EETAA, 2022). More than 31% require systematic support from other municipalities or the corresponding region, and only 12% have a fully operational technical department (EETAA, 2022).

Figure 18. Analysis of the capacity of the technical departments per municipality type.



Finally, the 13 Regions have fully operational technical departments, and therefore high technical capacity to undertake mobility interventions. The regional technical departments operate under the relevant directorates, which in turn are typically integrated into the comprehensive Directorates General of “Development Planning, Environment and Infrastructure”. More specifically, each region has a technical department located in its capital, which makes executive decisions on issues affecting the whole region. To encourage intra-regional decentralisation, an additional technical department is also established in the capital of each regional unit to carry out studies and projects within its borders.

Transport services and responsibilities in Greece

The following sections provide an overview of the transport context in Greece. They cover public transport services, taxis and ride-hailing, rail, private vehicles, road infrastructure, ports and airports, and freight transport.

Urban and inter-urban public transport services

The institutional organisation of public transport in Greece differs between large metropolitan areas and smaller cities. Two large authorities are responsible for public transport in the large metropolitan areas of Athens and Thessaloniki. The Athens Urban Transport Organisation (OASA) is responsible for planning,

organising, co-ordinating, and controlling all surface and underground public transport services in the Athens area, while its subsidiaries, OSY SA and STASY SA, are responsible for the operation of transport services. It is the only city in Greece with a metro network, as of April 2024. In Thessaloniki, the second largest city in Greece, the competent authority for public transport is the Transport Authority of Thessaloniki (OSETh), which is responsible for developing, co-ordinating and monitoring urban public transport in the Regional Unit of Thessaloniki. The Thessaloniki Urban Transport Organisation (OASTh) is the public body responsible for the operation of buses in Thessaloniki. The two public transport authorities receive financial contributions from the government that allow services to be delivered at a lower cost.

In all other cities in Greece, except for the islands of Kos and Rhodes, public transport services are provided by the Joint Bus Receipt Funds, known by their Greek acronym, KTELS. These private transport companies are under the responsibility of the respective Municipality and Region where they operate. Buses and coaches are the main means of public transport in Greece. The services operate in a closed market where KTELS have the exclusive right to operate urban and interurban bus lines. Urban bus services serve transport within cities and between the city and neighbouring settlements (which do not have an interurban line), while interurban bus services connect the main urban areas with large villages and towns within the region, and with Athens or Thessaloniki, and with cities in other regions. There are two exceptions on the islands of Kos and Rhodes where urban services are provided by a municipal service directly operated by the municipality.

Law 102/1973 established KTELS as exclusive operators of bus services in the regions and municipalities (FEK 178/A/17-08-1973). The bus companies are supervised by the Ministry of Infrastructure and Transport and follow the country's administrative structure. There are 62 bus companies, approximately one in each Regional Unit. KTELS have elected boards; their shareholders own the coach vehicles that KTEL uses to provide the services through individual contracts, and based on Law 2963/2001, the Hellenic Ministry of Infrastructure and Transport supervises them (FEK 268/A/23-11-2001). KTELS own the bus terminals where they operate (Lorenzini & Ambrosino, 2019).

In the case of the islands of Kos and Rhodes, dedicated municipal transport companies provide services rather than KTEL SA. Under Law 2963/2001, municipalities are allowed to offer their own public transport services (known as municipal public transport) to transfer residents of the municipality to and from the centre of the municipality, as long as there is no existing KTEL line (or in the case of Athens and Thessaloniki, no OASA or OASTH service) serving the same route (FEK 268/A/23-11-2001). These routes are low frequency (3-4 times per day) and sometimes offered for free. The services are provided using buses owned by the local authority.

Contracts may be established between municipalities and public transport operators, i.e., KTELS, to provide intra- or inter-municipal transport services in addition to those already in operation. According to Law 2963/2001, these contracts shall specify (a) the duration of the service, the routes, the frequencies, the fare, and the compensatory contribution to be paid by the local authorities, (b) the conditions for granting the use or leasing of buses owned by the local authorities to the transport operators and (c) any other relevant matter. According to Law 2963/2001, urban services cannot receive subsidies (FEK 268/A/23-11-2001). However, according to Law 4568/2018, compensation is allowed at the urban level (FEK 178/A/11-10-2018). Municipalities can make a request to the government to provide compensation, or in other cases, municipalities can provide non-financial support, such as providing the buses for KTEL's use, as is done in some municipalities.

According to Article 186 of the Kallikratis program (Law 3852/2010), the definition of the interurban bus lines, including the starting point, the route, the stops/terminals, the minimum service level and fares, is

the responsibility of the Regions. Any new intercity services by KTEL are to be reviewed and approved by the Regions. Regions also inspect vehicles, withdraw unfit buses from circulation, and have the right to form a disciplinary board for sanctioning transport operators and bus owners (LSE, 2019). By the decision of the Minister of Infrastructure and Transport, the maximum prices charged to passengers are determined based on socio-economic criteria, taking into account the need for access to the network at a reasonable fare (FEK 178/A/11-10-2018). Fares are set on a per kilometre basis and have seven categories which correspond to seven types of KTELS, classified according to characteristics of their specific market. Regions can define fares within these thresholds. KTELS rely solely on fare revenue, in most cases, to fund their operations. As a result, fares are higher compared to other European countries.

According to Law 2963/2001 (FEK 268/A/23-11-2001) and later Law 4974/2022 (FEK 185/A/29-09-2022), the competent regional authorities in their area of responsibility, also have the responsibility to prepare the planning and scheduling studies of interurban road passenger transport (including bus services). They must submit these for acceptance and approval to the competent department of the Ministry of Infrastructure and Transport. Interurban buses have always been an important link between Greece's remote areas and villages and the cities and towns of each prefecture. In addition to promoting regional development, interurban public transport services are also used as means to enhance accessibility of isolated areas to as to avoid depopulation and improve access to services. Government and regional authorities are always interested in the cohesion of settlements in a county or region, which is why they subsidise efforts to create and maintain a minimum level of interurban services.

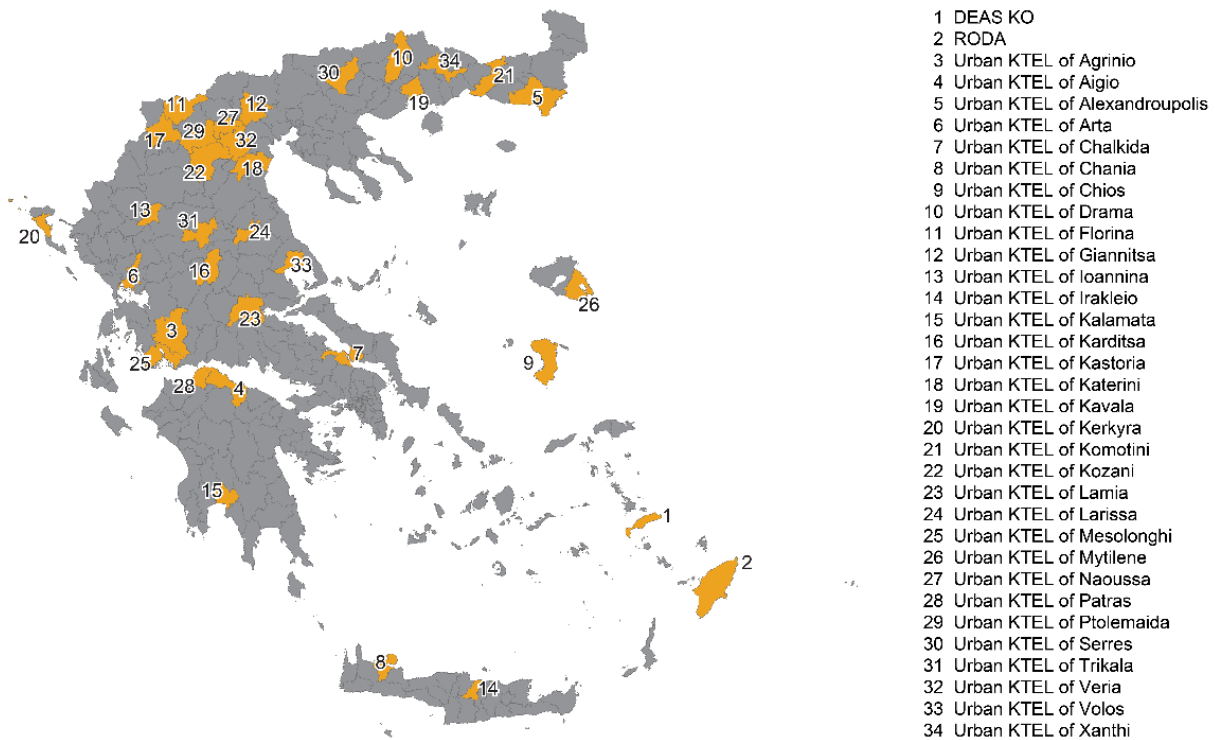
The exclusive rights given to KTELS creates a direct barrier to entry for competitors. The EU Regulation 1370/2007 ((EC) No 1370/2007) outlines the conditions for compensating transport operators and granting exclusive rights to provide public transport services by public authorities. Until December 2019, the KTEL system was exempted from this regulation during the transition period. Greek Law 4199/2013 (FEK 216/A/11-10-2013) for interurban transport and Law 4568/2018 (FEK 178/A/11-10-2018) for urban transport was put in place to implement EU Regulation 1370/2007 on the award of public service contracts. However, due to the active KTEL contracts already in place, and extensions to provide continuous service, there were few changes to the tender process. Greek Law 4974/2022 (FEK 185/A/29-09-2022), adopted in September 2022, is meant to finally implement Regulation 1370/2007 ((EC) No 1370/2007) and adopt new tendering procedures by 2024. It will require regions to submit specifications regarding the necessary urban and interurban bus services (routes, frequencies, etc.) to the government, who will then tender the services and award contracts. The government will handle the contracts and specify the economic criteria pursuant to the levels of service requested by the regions.

As can be concluded from the above, municipalities of the same Cleisthenes type share, in most cases, common characteristics with respect to public transport services. In all Type 1 municipalities (the metropolitan areas of Athens and Thessaloniki), public bodies operate the public transport system (OSY and STASY in Athens and OASTH in Thessaloniki), while public transport authorities oversee its smooth functioning. In addition, approximately 62% of Type 1 municipalities operate their own municipal public transport services to improve connectivity and accessibility within their boundaries. In a considerable share (36%) of Type 2 municipalities, public transport is operated by private companies (urban KTEL SA), while in one municipality, Rhodes, it is operated by RODA, which is the municipal transport company (POAS, n.d.). These companies operate urban buses to serve mobility needs within the main urban area of the corresponding municipality and connect it to neighbouring settlements or major trip attraction poles within the municipal boundaries, such as airports. In the remaining 64% of Type 2 municipalities, private interurban bus companies known as KTEL constitute the public transport operators due to the lack of urban buses. In these cases, coaches connect the main urban area of each municipality with the settlements and cities nearby, both within and beyond the municipal boundaries. Finally, either (interurban) KTEL or

municipal public transport services serve mobility needs in all other types of municipalities, i.e. Types 3-6, except for the Municipality of Kos (included in Type 5), where public transport, as described earlier, is provided by the municipal transport company called DEAS KO. In all of the above types of municipalities, except for Type 1, the Regions oversee the smooth operation of the public transport system.

The municipalities covered by urban KTELS, RODA and DEAS KO are illustrated in Figure 19.

Figure 19. Greek municipalities covered by urban KTELS, RODA and DEAS KO (adapted from POAS, n.d.).



Special public transport services

School transport is organised by the regions and municipalities and are provided through the existing public transport services (urban/interurban buses), or where needed, contracts are signed with KTELS or other bus companies under a public bidding process (Lorenzini & Ambrosino, 2019). Students who live beyond the minimum distance from their school unit as defined by Law 4217/2018 are eligible for free school transportation.

Regular tourist services are carried out by Tourism Road Transport Companies (TEOM), private bus operators, and General Tourist Agencies, which offer coach transport as part of their services. As of 2007, KTELS were granted by law the ability to set up General Tourist Agencies which also allow them to carry out tourist-focused services. These are distinct from regular services as the vehicle must hold a tourist coach license (Lorenzini & Ambrosino, 2019).

There are regulatory restrictions on the development of demand responsive transport in urban and rural areas as the current law only permits fixed route services offered by KTEL. OASTh offers transport to people with reduced mobility through an appointment-based system and owns three buses for this service. The Municipality of Thessaloniki also offers a similar program (AENEAS). Some studies have been conducted

regarding the viability of demand responsive transport, in particular in remote, mountainous areas such as the island of Thassos and Zagorochoria; and the rural area of Lagadas and the city of Kastoria and surrounding area. A public-private partnership between the government, Volkswagen Group, and the municipality of Astypalea also demonstrates an exception to the regulation in cases of experimental services and research. The six-year “Smart and Sustainable Island” project includes demand responsive transport using electric vehicles that can be used by all residents and visitors.

Taxis and ride-hailing

Taxi services are available in the municipalities, suburban and rural areas of Greece. The taxis services are regulated by Law 4070/2012 (FEK 82/A/10-04-2012), certain provisions of which have been amended by Law 4530/2018 (FEK 59/A/30-03-2018), which dictates licensing terms and conditions, vehicles’ technical requirements, and qualitative requirements for both vehicle owners and drivers. Though not an obligation, most taxis are associated with a dispatch centre which connects clients and taxi drivers and offers telephone or internet-based services. Ride-hailing and ridesharing services are not regulated in Greece. They have been present in Greece since 2014 and have been opposed by taxi operators. Companies such as Uber and Free Now that operate in major Greek cities operate only with professional taxi drivers.

Rail

The rail network in Greece is limited due to the mountainous terrain. Bus tends to be a more flexible option. The 2 571km of railways are owned and maintained by the Hellenic Railways Organisation (OSE), a state-owned company. TRAINOSE was established in 2005 as a subsidiary of OSE, to provide passenger and freight transport services. In 2017, TRAINOSE was privatised and transferred to Ferrovie dello Stato Italiane Group (FSI). From July 2022, the company was renamed Hellenic Train and is the main provider of rail transport for passengers and freight. The annual compensation of Hellenic Train by the State is EUR 50 million and includes an amount of up to EUR 21 million compensation to Hellenic Train for the provision of services, an amount of up to EUR 19 million for infrastructure usage fees paid to OSE and an amount of up to EUR 10 million to be paid to GAIAOSE (a public service company, 100% owned by the Greek State, active in the fields of railway property management and development and rolling stock management) as compensation for the rental of the rolling stock it uses.

Vehicle fleet

The number of vehicles in circulation in Greece exceeded 8.8 million in 2022, with 5.7 million being cars (Hellenic Statistical Authority, 2022b). This figure, which corresponds to the 10th largest fleet in the EU, results in a motorisation rate of 547 cars per 1 000 inhabitants, close to the EU average of 570 (Eurostat, 2023). It means that the land occupied by cars in Greece exceeds the combined area of its three largest municipalities, i.e. Athens, Thessaloniki, and Piraeus (ACEA, 2023; Sdoukopoulos, 2021).

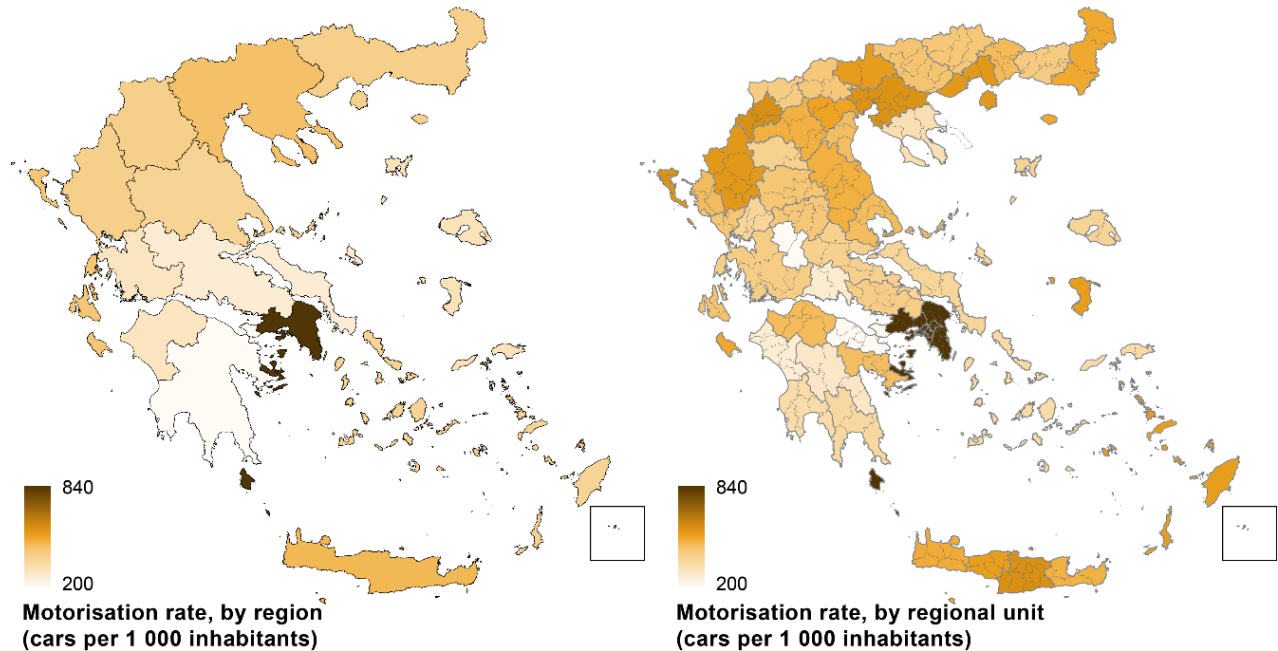
The Greek vehicle fleet consists of ageing vehicles, largely due to the financial crisis from 2009 to 2019. Greece currently has the oldest passenger car (17 years), light commercial vehicle (20.8 years) and truck (22.7 years) fleets in the EU and the second oldest bus fleet (19 years), all of which are heavily dependent on conventional fuels (ACEA, 2023). Based on 2021 data, in the EU, the average age of passenger cars was 12 years, the same as for light commercial vehicles, while trucks and buses were, on average, 14.2 years and 12.7 years old, respectively (ACEA, 2023). Moreover, the Greek automotive market increasingly relies on used vehicles imported from other European countries (ITF, 2023). Nearly half (41%) of newly registered vehicles entering Greece for the first time in 2022 were previously used and ran on conventional fuels (ITF, 2023). This is almost double the share of 21% in 2015 (ITF, 2023). Finally, just 4% of vehicles in

Greece run on LPG or CNG, and only 0.1% are BEVs or PHEVs (Ministry of the Environment and Energy, 2023a), with conventional fuels dominating the market in Greece and the EU in general. 93% of passenger cars, 97% of light commercial vehicles, 97% of trucks, and 93% of buses in the EU use gasoline or diesel. In contrast, battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs) and vehicles running on alternative fuels make up very low shares, ranging from 0.9% (trucks) to 7% (buses) (ACEA, 2023).

To explore similarities and differences between Greek local authorities in terms of motorisation, an analysis of the number of cars per 1 000 inhabitants was carried out. Figure 20 presents the results of this analysis based on data from the Hellenic Statistical Authority. The analysis uses population data from the 2021 census and the number of cars in circulation in each regional unit and region for the year 2022 (Hellenic Statistical Authority, 2021, 2022b). Due to data constraints, it is assumed that all municipalities within a regional unit have the same car ownership values.

As can be concluded from this figure, the motorisation rate varies considerably across the different local authorities. The Region of Attica and its municipalities have by far the highest number of cars per 1,000 inhabitants in Greece, reaching approximately 840. This is followed by the Region of Crete, with a motorisation rate of 472, with the municipalities of the Regional Unit of Irakleio leading with an average of 521 cars per 1 000 inhabitants. The Region of Central Macedonia records a similar motorisation rate of 450 cars per 1 000 inhabitants, with the municipalities of the Regional Unit of Thessaloniki being at the top and presenting an average value of 508. On the contrary, Peloponnese and Central Greece have the lowest motorisation rates of all Greek regions, with 201 and 265 cars per 1 000 inhabitants, respectively. The municipalities of the Regional Units of Korinthos and Euritania, located within these regions, record the lowest motorisation rates, having only 58 and 52 cars per 1 000 inhabitants, respectively.

Figure 20. Motorisation rate per region and regional unit (passenger cars per 1 000 inhabitants).



Road infrastructure

Greece has a road network spanning 117 000 km, of which 75 500 km are in urban areas and 41 500 km on inter-urban routes (Enterprise Greece, 2022). Different systems are used to classify the Greek road network, including the functional and the administrative classifications. The former takes into account the function and design standards of roads, while the latter considers the role of roads in connecting different areas and provides the basis for defining the responsibilities for operation and maintenance among different bodies. The administrative classification identifies three main types of roads, i.e. national, provincial and municipal/local. The first two types are subdivided into primary, secondary, and tertiary national, and primary and secondary provincial, respectively. A more detailed description of the various types of roads based on the administrative classification is given in **Box 3**. The road map of Greece according to the same classification is shown in Figure 21. It should be noted that municipal/local roads are not illustrated in the figure for the sake of visibility. The same figure also shows the roads and urban nodes included in the TEN-T network, as proposed by the European Commission in the proposal for the revision of the TEN-T Regulation (COM/2021/812 final) and amended proposal (COM/2022/384 final).

Box 3. Administrative classification of Greek road network

According to the administrative classification (FEK 146/A/02-09-1993), the Greek road network is divided into the following types:

1. National network

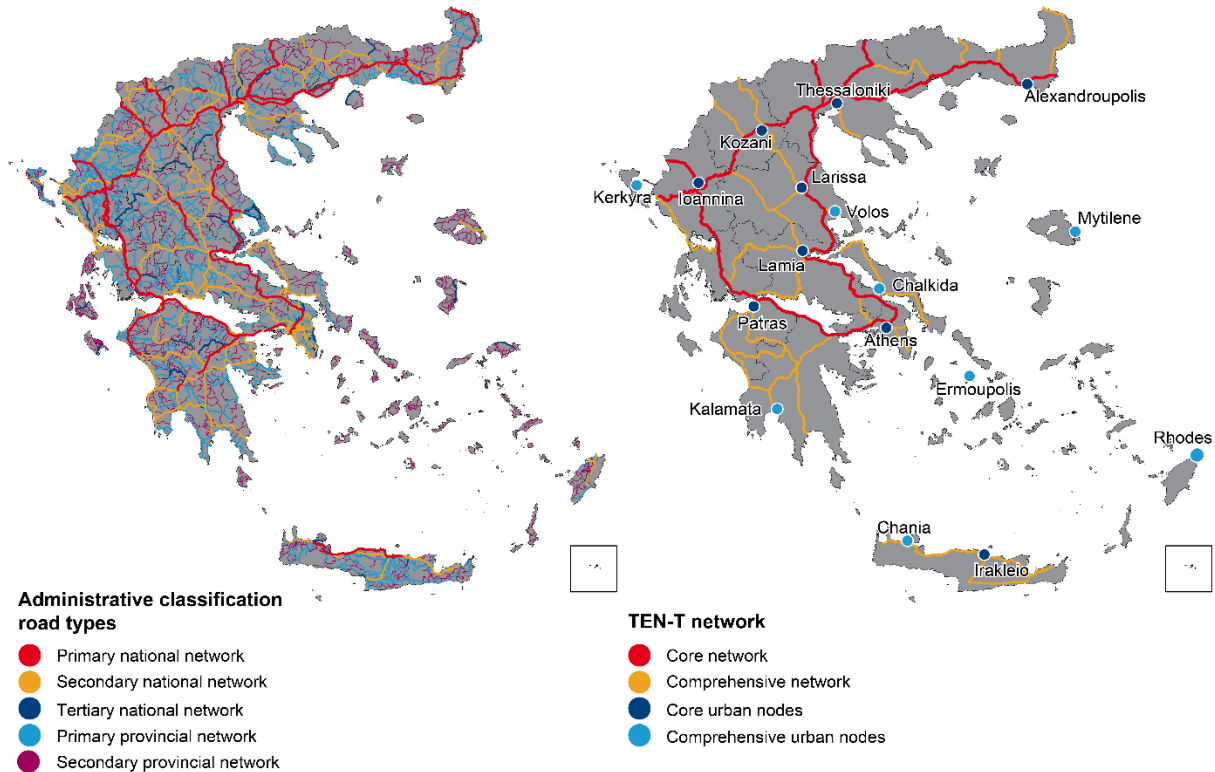
- 1.1. Primary national network: Interconnects the main Greek urban centres or links Greece to other countries either directly or by ferries.
- 1.2. Secondary national network: Interconnects the primary national road axes or links them to the main urban centres, ports, airports or places of high tourist interest or constitutes a deviation from the primary national road network.
- 1.3. Tertiary national network: Provides access to archaeological, tourist, historical or development areas or is part of the national road network that has been replaced by a new road.

2. Provincial network

- 2.1. Primary provincial network: Connects urban centres to the national road network and areas of archaeological, tourist, historical or development interest.
- 2.2. Secondary provincial network: Interconnects municipalities except the capitals of the regional units.

3. Municipal/local network

Figure 21. Map of Greece showing the administrative classification of roads and the TEN-T network.



The national road network density is highest in the Region of Attica, followed by Epirus and Central Macedonia. As regards the density of the provincial road network, the Region of Ionian Islands has by far the highest value, followed by the Regions of Crete and Epirus. When it comes to municipalities, Type 1 municipalities lead the way in terms of the density of both the national and provincial road networks.

According to Greek legislation, municipalities are responsible for the maintenance and safe operation of municipal/local roads (General Secretariat for Civil Protection, 2017). This also applies to all sidewalks within built-up areas, regardless of the type of road, yet the landlords of adjacent properties share this responsibility as well. In addition, municipalities are often responsible for the segments of national and provincial roads that pass through built-up areas (General Secretariat for Civil Protection, 2017). More specifically, whether this responsibility falls under the respective municipality or region is determined on a case-by-case basis (General Secretariat for Civil Protection, 2017). This determination is based on the decisions of the General Secretaries of the former state regions or the Heads of the regions before and after the Kallikrates reform, respectively (General Secretariat for Civil Protection, 2017). For example, the maintenance of Piraeus Street in Athens, which is classified as a secondary national road, is the responsibility of the Region of Attica, whereas the maintenance of Egnatia Street in Thessaloniki, also classified as a secondary national road, falls under the responsibility of the Municipality of Thessaloniki.

In every case, regions are responsible for maintaining the national and provincial road network outside built-up areas, except for motorways (General Secretariat for Civil Protection, 2017). Motorways, typically included in primary and less often in the secondary national road types, have, in most cases, been awarded under concession contracts. The concessionaires are, therefore, responsible for their maintenance (General Secretariat for Civil Protection, 2017). Finally, the maintenance of non-concessionary motorways

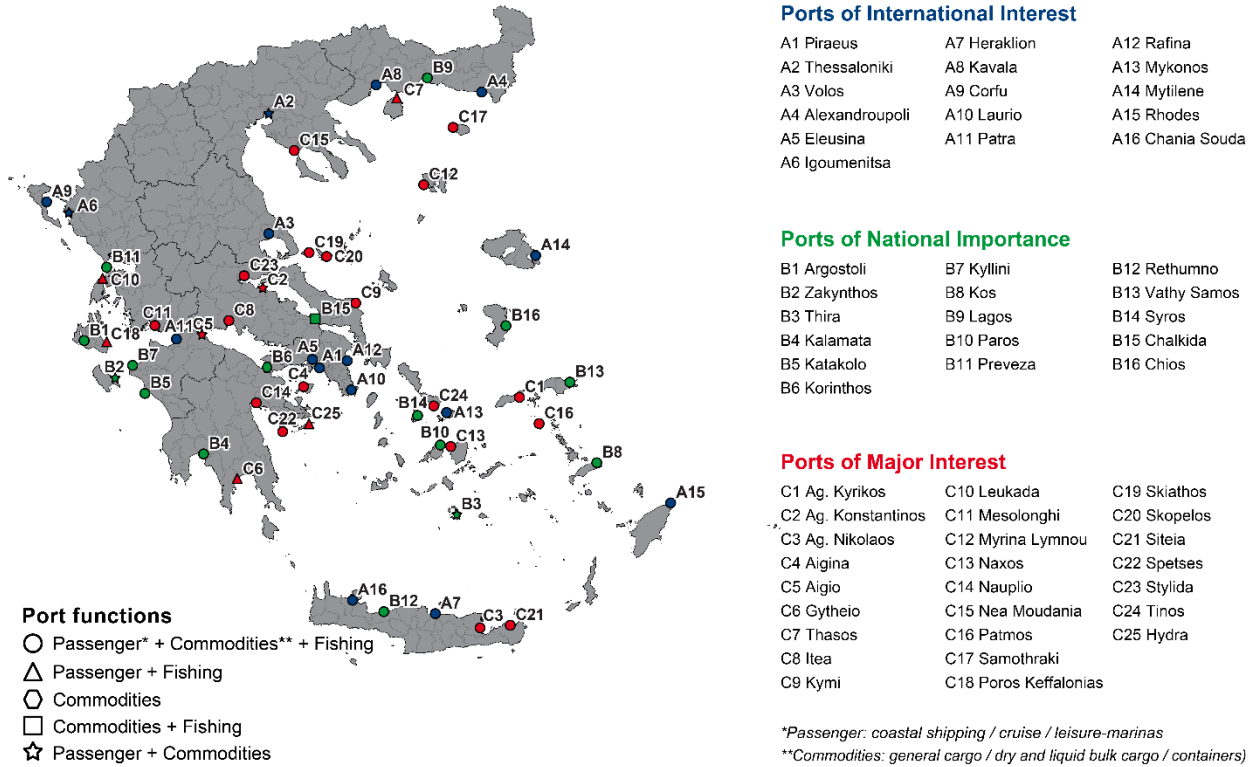
and the secondary/side roads of all motorways is the responsibility of a state agency under the MoIT (General Secretariat for Civil Protection, 2017).

When it comes to implementing traffic management measures, including the introduction of one-way streets, changes to the circulation plan, the construction of cycle lanes, changes to the width of carriageways or pavements, the introduction of traffic lights, the imposition of traffic and parking restrictions, etc., the decentralised administrations are also involved in addition to the municipalities and regions (FEK 261/A/17-12-2014). When the above measures concern the municipal or provincial road network, the Regional or Municipal Council responsible for the network in question makes decisions based on studies prepared by their respective technical departments or on their behalf. These decisions must, in turn, be approved by the corresponding decentralised administration before any measures can be implemented (FEK 261/A/17-12-2014). On the other hand, for cases involving the national road network, motorways, and basic road axes in major urban centres such as Athens, Thessaloniki, Volos, Irakleio, Larisa, and Patra, implementation of measures must be based on studies conducted by the MoIT or the decentralised administrations and approved by competent Regional Police Directorates or Traffic Directorates (FEK 261/A/17-12-2014).

Ports and airports

With almost 6 000 islands and islets scattered in the Greek Seas and an extensive coastline of 13 676 km, Greece has an enormous number of ports exceeding 900 (Greek National Tourism Organisation, 2023; Ministry of Maritime Affairs and the Aegean, 2013). According to Greek legislation (FEK 202/B/16-02-2007), Greek ports are classified into four categories based on their role in the national port system, the annual volume of goods and passengers handled and their growth potential. These categories are a) ports of international interest; b) ports of national importance; c) ports of major interest; and d) ports of local importance. As the 57 ports included in the first three categories form the backbone of the Greek port system, the analysis presented below focuses on them. Figure 22 maps these 57 ports.

Figure 22. Main ports in Greece.



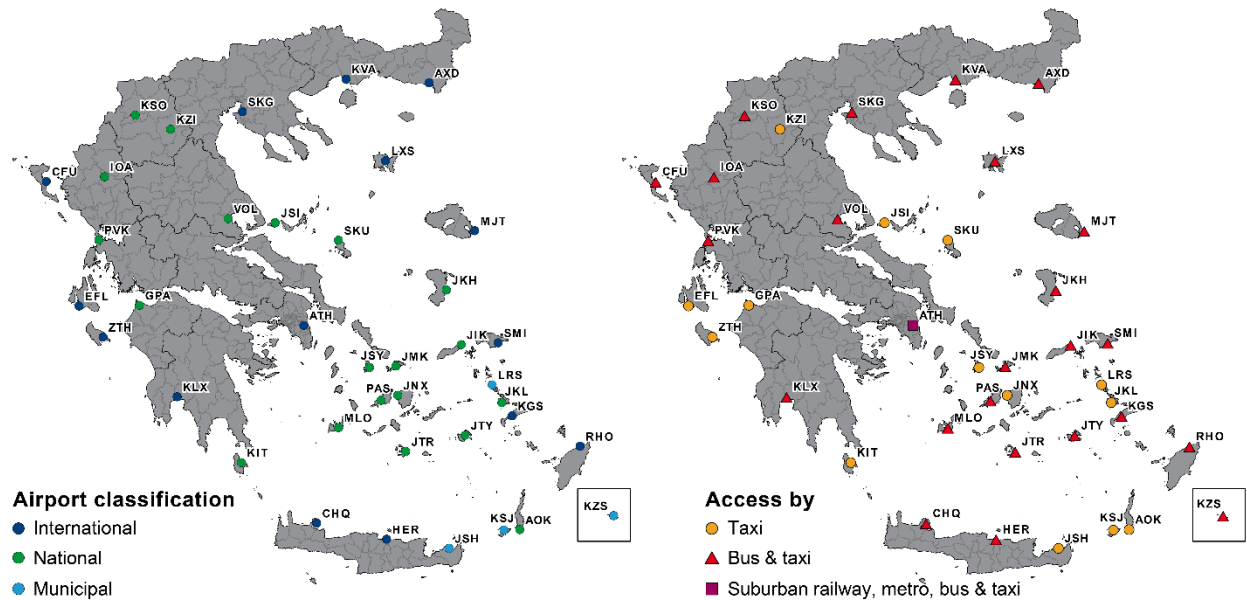
As can be seen from this figure, 29 ports are located on the mainland, and the rest 28 are on the islands. The mainland has the most (10 out of 16) ports of international interest, while the islands have the highest number of ports of national importance (9 out of 16) and of major interest (13 out of 25). The Region of Southern Aegean has the highest number of ports (9) among all Greek regions, followed by the Region of Attica with seven ports. The Region of Attica has also the highest number (4) of ports of international interest. A vast majority of these 57 ports, approximately 55%, are located in Type 2 municipalities. Type 5 municipalities account for 23% of all ports, while Type 3 municipalities have 13%. In contrast, only 5% of ports are located in Type 6 municipalities, and a mere 4% in those classified as Type 1.

All ports serving passenger flows are accessible by taxi, except Hydra, which is a car-free island. Moreover, buses provide transport to and from the various ports in most cases. In addition to the above, Greece's largest port, Piraeus, can also be reached by other means of transport, such as the metro and tram.

In addition to the large number of ports, the landscape of Greece has resulted in a relatively high number of airports. As can be seen in

Figure 23, Greece features 39 airports, of which 11 are located on the mainland and 28 on the islands. The Region of Southern Aegean has the largest share of the Greek airports (around 36%), followed by the Regions of North Aegean with approximately 13%, Crete and the Ionian Islands with almost 8% each. Most airports are located in Type 2 (43.6%) and Type 5 (33.3%) municipalities, with the remaining airports found in Type 3 (12.8%) and Type 6 (10.3%) municipalities.

Figure 23. Airports in Greece.



Out of a total of 39 airports in Greece, 15 are classified as international airports. These airports are equipped with permanent customs facilities suitable for international flights. On the other hand, 20 airports are classified as national airports, which are used for domestic and international charter flights. Finally, there are four municipal airports in Greece that are designed to accommodate small aircraft and are only meant for local use.

Based on data collected from the Hellenic Aviation Service Provider (2023), about 61% of Greek airports are served by taxis and either urban or interurban buses, while at almost 36% of airports, only taxis provide transport to and from the airport. The vast majority (85.7%) of the latter are island airports. Finally, Athens International Airport “El. Venizelos” is the only Greek airport that can be reached by multiple means of transport, specifically by suburban railway, metro, bus, and taxi.

Freight transport

Road transport plays a crucial role in the Greek economy, serving as the primary mode of freight transport. 97% of the transported tonnage within the Greek mainland is carried by road freight transport, contributing approximately 7% to the country’s GDP (Moschovou & Tyrinopoulos, 2018). Within urban areas and metropolitan regions, trucks are the predominant, and in some cases the only, means of transport for most goods. According to data gathered from the Hellenic Statistical Authority for the year 2022, the total number of trucks in circulation was 1,405,971, with 97.4% of them being for private use and the rest 2.6% for public (Hellenic Statistical Authority, 2022b). Notably, 33% of the former and 39% of the latter type of trucks were registered in the Region of Attica.

In 2020, Greece had 16 031 active companies in road freight transport, representing 2.9% of the EU sector (De Smedt & De Wispelaere, 2020; Hellenic Statistical Authority, 2020d). These companies employed a

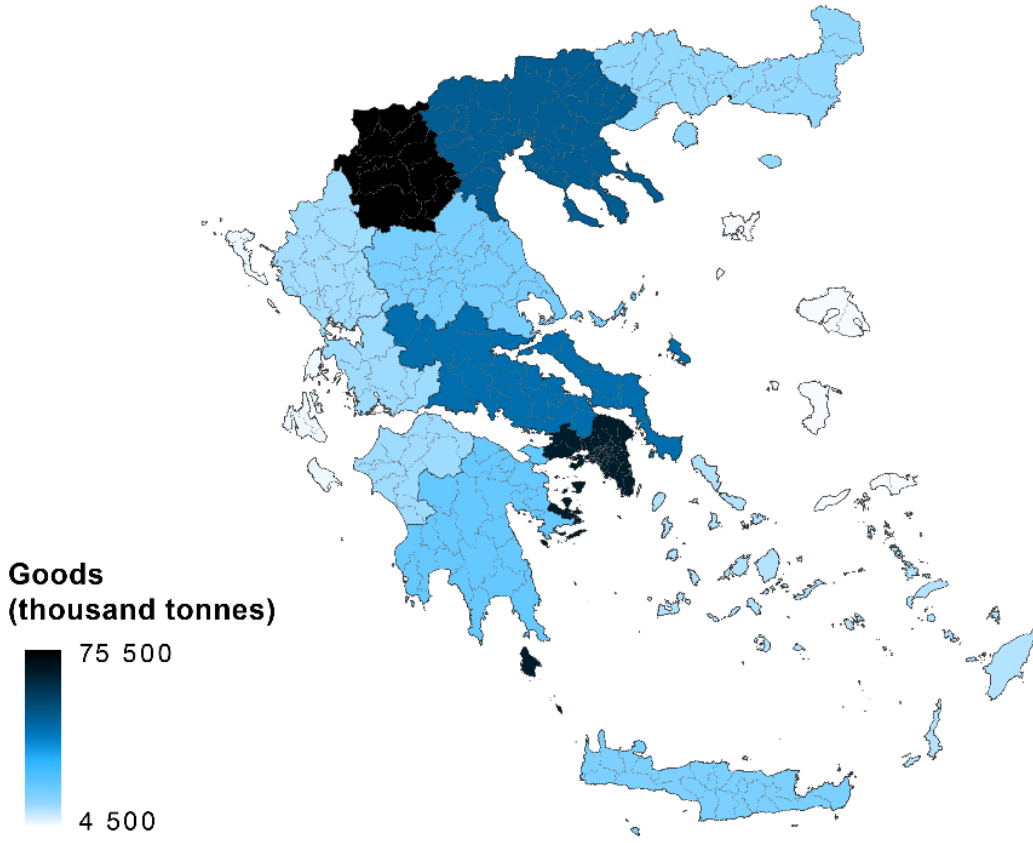
total of 38 535 people and had a net turnover of approximately EUR 2.6 billion (Hellenic Statistical Authority, 2020a). The analysis of the above data indicates that the Greek road freight transport industry is mainly made up of very small businesses. These enterprises employ only 2.4 people on average and generate a turnover of around EUR 165 500 per enterprise. This is significantly lower compared to the road freight transport industry in other European countries (De Smedt & De Wispelaere, 2020; Hellenic Statistical Authority, 2020b).

Further analysis of the road freight transport sector in Greece highlights that 354 082 thousand tonnes of goods were transferred by trucks in 2019, corresponding to 29.3 million tonne-kilometres (Hellenic Statistical Authority, 2020d). Solid bulk goods represented the majority of the transferred cargo at approximately 71%, palletised goods made up approximately 12%, and liquid bulk goods and containers each accounted for about 7%. The remaining 4% included mobile, self-propelled units and other cargo.

A significant share (22%) of the transferred goods was loaded in the Region of West Macedonia, followed by the Regions of Attica and Central Macedonia with 19% and 14%, respectively. At the opposite end of the scale, the Regions of North Aegean and Ionian Islands corresponded to extremely low shares, ranging from 1.4% to 1.6%.

Figure 24 illustrates in the form of a choropleth map the amount of goods loaded in each region in 2019.

Figure 24. Goods (thousand tonnes) loaded in each of the 13 regions in the year 2019.



What challenges do local authorities face concerning sustainable mobility?

The common challenges associated with SUMP development in other EU member states are also applicable in the Greek context. In general, these are related to the institutional framework governing SUMP development, and the extent (or lack of) co-operation between different levels of government. The lack of technical resources and stakeholder and public awareness are also often cited as obstacles in the Greek context. Primarily informed by feedback from stakeholder consultations across all types of municipalities, regions, national and freight stakeholders, this section explores how these common challenges manifest in the Greek context, exacerbated by the local circumstances, the established norms, and a lack of clarity regarding roles and responsibilities.

Local circumstances

In the Greek context, local circumstances such as geographic constraints and the resulting development patterns, compounded by heavy tourism can make the provision of sustainable mobility options challenging.

Geography and population

The geographic features of Greece influence the transport network and settlement patterns. For example, elevation due to the mountainous terrain is a factor when establishing possible transport options and road connections between destinations. Similarly, the sea creates a barrier for connections between settlements. Such geographic features can create operational bottlenecks, which can have cumulative effects on the overall capacity and efficiency of the transport network. For example, port capacity influences the capacity required for access and egress modes, and delays at ports can have knock-on effects on connecting scheduled services, such as public transport. As a result, when considering mobility measures, it is necessary to explore complementary measures, or address multiple challenges at once. Such an approach can account for the interconnectedness of the transport network. This approach requires more collaboration between different levels of government, as well as public and private stakeholders for implementation. Stakeholders can include private operators of transport services, port and airport authorities, as well as private enterprises involved in the tourism sector, such as tour operators and tourism accommodations.

The effect of the geography is also evident in the population distribution, and as a result, on settlement and travel patterns. In Greece, the most densely populated municipalities (Type 1 and 2) are the least mountainous (see Figure 15). However, even these municipalities face at least some geographic constraints (such as mountains and the sea) that constrain their transport networks. The challenges these municipalities face with respect to sustainable mobility planning are mainly related to managing increasing transport demand, shifting towards more sustainable modes, and co-ordinating between municipalities and different levels of government overseeing transport services. These municipalities typically have more established institutional capacities due to their size, and are all in the process of developing SUMPs.

By contrast, smaller and less densely populated municipalities typically have more challenging geographies, and a smaller share of them are required to have SUMPs by law. In this group, some Type 3 and 5 municipalities that tend to have larger year-round populations and more institutional capacity for strategic planning are in the process of developing SUMPs, including some that are not legally mandated to do so. These municipalities face similar challenges to Type 1 and 2 municipalities, albeit at a smaller scale or concentrated during high tourist season. Large seasonal peaks in demand can be significant in comparison to their smaller permanent population. For example, some municipalities in this group (e.g. Sithonia) have multiple settlements and high tourism demand, but connections between these

settlements are hindered by the limited road networks as a result of the mountainous terrain. In such instances, providing adequate public transport connections can be costly, even within the same municipality. This can be further complicated by heavy tourism volumes during peak seasons, when the limited links between settlements are further constrained in terms of capacity. These municipalities also often have more limited staff resources.

The least populous municipalities (Type 4 and 6) also typically have challenging geographies, however, none are required by law to develop SUMPs. Despite this, many of these municipalities face significant transport related challenges, and often have limited institutional capacities for creating land use plans, let alone strategic plans. For example, island municipalities with small year-round populations tend to have more limited connectivity to the mainland in winter months, which impacts services and supplies. While some of these challenges can be considered in regional SUMPs, this process will require an approach that meaningfully engages the municipalities. The level of engagement between municipalities and their corresponding regions varies, and some of the challenges with that process are discussed further in the following sections.

Tourism

In Greece, tourism can present a challenge for mobility planning, given the volume of tourists and seasonality of demand. This challenge is particularly notable for areas that experience influxes of tourists during peak seasons that outnumber the year-round population (there can be as many as 1.9 tourists per capita in some small island municipalities (Figure 17)). Although mobility measures targeted to full-time residents may not necessarily differ from those needed to accommodate tourists, the high peaks in demand both in terms of capacity of infrastructure and service delivery can mean rapid scaling up and down of services within short time spans and can require relying heavily on seasonal resources.

Larger municipalities typically face year-round capacity constraints in their road and public transport networks and require both enhanced services and infrastructure, as well as strategic approaches to demand management. For example, in the large metropolitan areas of Athens and Thessaloniki, measures that increase capacity by better utilising or upgrading existing infrastructure can address the travel demands of the permanent residents as well as accommodate tourism demand. These include investment in higher capacity public transport networks, as well as road space reallocation to prioritise collective, shared and active modes.

However, even in these places, there are periodic influxes of tourists that can create bottlenecks and additional capacity issues. This is often the case at ports with the arrival of large cruise ships, or at specific locations frequented by coach tours. Accommodating these instances can be particularly challenging in already constrained transport networks, particularly where private car use is strongly preferred, leading to an over reliance on the mode and capacity constraints. In fact, for many of the smaller municipalities, accommodating peak season mobility demands is the main driver for implementing mobility measures and developing SUMPs. The high number of pedestrians and vehicles during peak tourism seasons leads to challenges in terms of capacity, and significant issues for enforcement, especially for parking violations.

During the peak seasons, mobility service providers have to balance the needs of the local residents with those of tourists, which may not necessarily align. For example, where the local authorities rely on the same service providers for school services as they do for public transport, there are often complaints about preferential treatment for tourists, with reports of operators prioritising tourist pick up over student pick up. For municipalities, there is little recourse in such situations, because serving the tourist demand is more lucrative for private operators, and staff resources for performance monitoring are limited. During the off-peak seasons when demand is low, municipalities have to subsidise the more limited services in place to maintain mobility for year-round residents.

Established norms

In addition to the local circumstances, some of the established norms can cause resistance to change and require significant engagement as well as political will to overcome. These norms mainly relate to public and stakeholder perceptions and a regulatory landscape that can present barriers for implementing mobility measures proposed in SUMP.

Public and stakeholder perceptions

In Greece, car ownership levels are high (see Figure 20), and the role of the personal car in the transport system is prominent. Consequently, attitudes towards measures that limit car use, such as access restrictions and tolls, can be politically unpalatable. Nonetheless, all the municipalities consulted identified the need to consider restrictive measures for addressing mobility challenges. Specifically, parking management, access and speed restrictions, and road space reallocation to active modes were popular for their potential impacts on reducing congestion, improving safety, and encouraging mode shift. However, for all municipality types consulted, the required cultural shift to make such measures acceptable was expected to be a barrier to their implementation.

Many municipalities noted that efforts to manage parking or reduce speeds are expected to be challenging due to overall lack of enforcement. For example, efforts to restrict parking for non-residents in the historical areas can be met with opposition from the public and can require additional stakeholder engagement. The combination of lack of enforcement and public opposition can make it challenging to get political buy-in for mobility measures. Meaningful engagement of the public and stakeholders is needed to increase acceptance for mobility measures.

For the municipalities consulted, the level of public engagement was perceived to be an obstacle in the success of SUMP development. Gaining public acceptance was widely viewed as a necessary step in shifting away from established norms. However, local authorities often found it difficult to meaningfully engage the public during SUMP development and would only receive feedback once measures were implemented. Public consultation as part of the planning process is a budding practice in many Greek contexts, and there are still barriers to participation. Although this is changing, the resource allocation for public consultation in the SUMP development process has yet to catch up, further marginalising public consultation and engagement of other stakeholders including businesses and contracted services, such as the KTEL. Businesses and contracted services also face constraints on staff time, which presents a further challenge to participation. Some smaller municipalities take a much more proactive approach with regards to consultation, by engaging directly with citizens in public spaces. However, this approach is resource-intensive, and would not scale well for larger municipalities.

Institutionalisation of public consultation (Law 3852/2010) is beginning to normalise the process at the regional and local level. Law 3852/2010 consolidates and essentially guarantees the involvement of citizens in the public sphere by obliging the establishment of a municipal consultation committee in municipalities with a population of more than 10,000 inhabitants (FEK 87/A/07-06-2010). However, to meaningfully engage the public in the planning process, local authorities will need to go beyond the legislated requirements for consultation to engender a culture of participatory planning.

Consulted stakeholders considered strong political will or a champion for measures that may risk pushback, as necessary to the successful implementation of SUMP. However, political terms may not align in length with the results from implemented measures, leading to further challenges. In particular, measures that may require more time to implement or may cause disruptions during their implementation can be considered to be politically inexpedient.

Regulatory landscape

For some measures, the barrier is not with public and stakeholder perceptions, but rather with the regulatory landscape, which can be fragmented, especially as it relates to the provision of public services. For example, as previously noted, KTELS have maintained a hegemony over the provision of public transport services in most of the country, due to regulations that assign these operators the sole right to provide services in a closed market. As a result, many local authorities report contentious relationships with KTELS, from the planning process, to performance monitoring and data sharing. They feel that they do not have access to information related to travel patterns and do not have much power to intervene on public transport planning.

Given the advantage KTELS have had in the market for decades, transitioning to open tenders for these services continues to be a challenge, despite changes in regulation. In addition, various local authorities consulted feel that KTEL services often operate with a lack of transparency. This means that local authorities do not have access to vital information related to travel patterns that can be useful in informing the specifications in future service procurement contracts. In addition, as the incumbent service providers, KTELS will maintain a competitive advantage, even in an open market.

Recent regulations aimed at easing the transition to open tenders have placed an emphasis on the role of regional authorities in interurban service design, fare setting, and fleet and infrastructure considerations reporting to the national government who will ultimately issue the tenders. These revised regulations can be an opportunity for co-ordinating procurement, which may result in more lucrative contracts and more bidders. In order for this to work however, more co-operation between municipalities and regional authorities will be required to fully understand needs. It will also require some clarification regarding roles and responsibilities as they pertain to public transport service which currently include many grey areas from the perspective of regional and municipal authorities.

Urban public transport services currently remain within the purview of local municipalities, who can consider contracting these services to a third party, or supplementing existing service if there is a KTEL in place. However, if there are existing KTEL services, municipal services tend to be limited, since municipalities need to work with the existing service providers. To provide additional services, municipalities can compensate KTELS, or provide non-financial support. In one municipality (Serres), the authority opted to provide the fleet and contract the operations. This structure gives the municipality more flexibility in terms of the fleet specifications, which can in turn be used to address additional priorities, such as the transition to electric fleets, or the purchase of more accessible vehicles. However, such structures are uncommon, given the current relationships between KTELS and municipalities, limited funding, and the staffing constraints on the local authority side to monitor alternative service delivery structures.

The SUMP development process can be an opportunity for national authorities to work with local authorities to explore opportunities to revise regulatory frameworks within the context of the broader urban policy environment, to address multiple objectives at once. Some sector-specific regulations can be revisited with this in mind. This is particularly relevant in the Greek context as it pertains to the regulation of new and shared modes, which may not be permitted within the current regulations.

Existing regulations limit the possibility of alternative service delivery methods, such as demand-responsive transport. Although KTELS are private service providers, they are expected to provide a minimum level of service connecting settlements without other public transport, which can be subsidised by the region or municipality. However, in areas where such services are needed for basic mobility, it can be costly to provide fixed-route services with adequate coverage and frequency. This means that areas

which could potentially benefit from the flexibility and scalability of demand-responsive service are compelled to rely on more limited fixed route services.

Some exceptions to the existing regulations allow the operation of on-demand services on a pilot basis – such as the public-private partnership in the municipality of Astypalea. This six-year initiative is the result of a partnership between the Hellenic Republic and Volkswagen Group to explore various measures to transform mobility on the island. This arrangement can function as a regulatory sandbox, allowing the regulators to develop appropriate policies during the pilot phase. For regulators taking the limited pilot approach, it is necessary to consider how the duration of the pilot may influence the success of such a program. If the duration is too short, it may not be enough time to allow users to try the service and change their behaviour. A too-short program can also create uncertainty for service providers. Such considerations require adequate staff resources to collect data and monitor progress, which is also an additional barrier, particularly at the local level.

Similarly, taxi regulations in Greece have effectively curtailed the operation of ride-hailing services, despite the prevalence of such services elsewhere. Currently, ride-hailing services operate in a more limited fashion, within the limits of the existing taxi regulations. This means that the potential access benefits, mainly from increased supply, that can be realised by such schemes are missed. Nonetheless, the strong taxi regulations in place present an opportunity for public authorities to revise regulation, focusing on addressing issues experienced in other contexts related to rider and driver safety, equity in service provision, the employment conditions of drivers, and congestion and emissions concerns (ITF, 2019).

Changes to the regulatory landscape will require consultation and co-ordination between local, regional, and national authorities, while the ultimate ability to change regulation rests with the national government. The lack of staff resources at the local level in many smaller Greek municipalities may pose a challenge in this regard.

Roles and responsibilities

SUMP development calls for cooperative relationships between different levels of public authorities and service providers in order to address mobility challenges while achieving other environmental and economic objectives. Currently however, there is a lack of clarity regarding the distribution of roles and responsibilities, which stems from two main issues:

- devolution of responsibilities to local governments that may be limited in terms of staff resources; and
- the strategic role of SUMP, particularly in relation to other decision-making processes related to transport and land use planning.

As previously noted, there is no hierarchical relationship between regions and municipalities in Greece, however regions have a role to play in the delivery of services and in ensuring intra-regional co-operation. In this context, and with the devolution of responsibilities to municipalities in recent reforms, there are challenges with respect to the allocation of roles and responsibilities between regions and municipalities, exacerbated by a lack of technical and staff resources.

This issue was repeatedly alluded to in consultation, particularly regarding jurisdiction over the planning and provision of public transport and over roads. For public transport, while regions and municipalities have jurisdiction over interurban and urban services, respectively, there are areas of overlap. For example, for some smaller municipalities without dedicated public transport, the interurban service functions as de facto local services. However, the possibility of working with the interurban KTELs to optimise such services

to better serve local needs can be limited by staff capacity and the level of co-operation between the local authorities and operators, even when such an agreement can be beneficial for both parties. Regions can work with KTEL operators to define services where the KTELS are open to such cooperation, but this also limited by the availability of staff capacity at the regional level to take on these additional monitoring tasks. Monitoring of KTEL services to ensure they are providing the agreed upon levels of service is limited due to these resource constraints in authorities.

For roads, where national and regional roads pass through a municipality, the process to implement any measures on those roads outside their jurisdiction can be long and bureaucratic for municipal authorities. However, in this instance, recent amendments to the Road Traffic Code (article 60, Law 5003/2022) are expected to simplify the process and significantly reduce the time needed to implement traffic management measures (FEK 230/A/14-12-2022). The authorities responsible for other measures, such as designating delivery times and urban speed limits, seemed to be unclear, partly due to the challenge of co-ordinating such measures across municipal boundaries.

In fact, the allocation of roles and responsibilities can be made more complex by travel patterns, which are not confined to administrative boundaries. In Greece, all existing SUMP have been prepared at the municipal level, however, all regions are also expected to develop SUMP, though their mandate is to focus on major transport hubs and their connections to the rest of the region. Some larger municipalities suggested that the study area for SUMP should be dictated by the functional urban areas to better account for actual travel behaviour of urban residents. This was particularly relevant for metropolitan areas, especially those of Athens and Thessaloniki that already have metropolitan public transport authorities (OASA and OSETh, respectively). Currently, co-ordination between neighbouring municipalities is supposed to be carried out through SUMP working groups. For OASA and OSETh, they have legislative authority to veto SUMP measures, and their participation in SUMP working groups is mandatory. In addition, they are required by Law 4784/2021 to take into consideration SUMP that have been issued a ministerial decision when developing their own strategies. However, even with the framework in place to allow for better collaboration across jurisdictions, the lack of staffing resources makes this a challenging effort. It is also possible that a framework with several SUMP in the same metropolitan area leads to duplication of efforts and some redundancies between them. In fact, OASA is planning a Strategic Transport Plan for Attica, which is intended to integrate supra-local measures proposed in the framework of the SUMP of its municipalities. The development of this plan will require extensive engagement with the local municipalities.

A clearer understanding of the relationship between SUMP and other municipal planning policies and procedures can play a role in clarifying roles and responsibilities for the different authorities. Although municipalities have the autonomy to integrate their planning policies with their SUMP, either as measures to be implemented, or as strategies for consideration in the preparation phase, based on feedback received during consultation, it is not necessarily apparent how this is to be approached. In addition, the SUMP process has requirements for data collection and reporting that are independent of other municipal planning policies and implementation processes. For example, data that can be relevant for SUMP elaboration is not necessarily found in one single municipal department, which may necessitate dedicated staff to consolidate the available data from different departments. As such, it can be harder to designate ownership over the collection and maintenance of the data necessary to both implement and evaluate measures. This is a significant hurdle that compounded by the lack of staffing resources, as discussed in the following sections.

Recommendations for sustainable urban mobility management

The following recommendations address the barriers to successful implementation of SUMP and related transport policy measures, voiced by local authorities:

- **Promote a balanced mix of transport modes is necessary for resilient transport systems that serve both residents and tourists.** Car-centric planning and a strong prevalence of car use has led to capacity constraints (including parking issues), congestion and the associated negative externalities in many Greek cities. Accommodating high influxes of tourists can be particularly challenging in already constrained transport networks. Promoting a more balanced mix of modes can both improve accessibility, as well as make the transport network more resilient during these peaks (ITF, 2023). Smaller municipalities experiencing seasonal capacity constraints require more flexible and scalable approaches to manage seasonal demand while maintaining a basic level of mobility for year-round residents. Shifting public opinion on car use will be a challenge that requires effective engagement and consultation, in addition to improving alternative modes.
- **Allocate budget and staff support to institutionalise the process of consultation is necessary to meet the Greek SUMP Law's minimum consultation requirement of three public consultations.** Importantly, the process should be accessible and should encourage clear, consistent two-way communication. As much as possible, public engagement programs should bring the practitioners to where people are (e.g. public squares, markets) to expand their reach, and make citizens aware of programs. For private enterprises and operators, authorities should also make an effort to conduct targeted outreach.
- **Adopt a supportive regulatory framework that allows co-ordination between local, regional, and national authorities, along with private entities involved in providing mobility services during the implementation of SUMP measures.** While the national authority is ultimately responsible for updating regulations, the local and regional authorities, as well as the service providers, are well positioned to make sure that regulations are context-appropriate. As such, the process for developing and updating regulations to support the implementation of mobility measures, particularly with respect to innovations in the sector should be collaborative and responsive. Pilot programs and regulatory sandboxes can be a way to give local authorities the autonomy to explore context-relevant solutions, working with service providers, in an environment where risks can be closely monitored. Existing regulations limit the provision of services like demand-responsive transport, ride-sharing etc.
- **Clarify the relationship between SUMP and other strategic land use and transport planning policies and processes.** To successfully implement SUMP, their role in the overall planning framework should be made clear. Currently, the plans and studies required to implement SUMP mobility measures in the Greek context exist independently of the SUMP process, making the mechanism for prioritising the implementation of measures unclear and potentially introducing redundancies. The MoIT envisions that pre-existing plans should be integrated in the development of SUMP, for example environmental assessments, climate action plans, strategic transport plans, or accessibility plans. If a SUMP calls for actions that require an update to a pre-existing plan, this approach still means that SUMP actions will be delayed until such an update is made. Clarifying the role of the SUMP in the overall planning framework to local authorities would be beneficial in achieving the SUMP objectives and allow timely implementation.

Importantly, without appropriate budget resources and staff capacity, these barriers cannot be addressed. Particularly at the local level, limitations in technical staff, and limited budget resources to contract consultants, developing, implementing and monitoring SUMP will be very challenging. Even in contexts where regional authorities can fulfil some of these roles, the involvement of local authorities will be necessary to make sure approaches are context-relevant.

Bridging challenges to data management, monitoring and evaluation

Developing and evaluating SUMPs requires leveraging a wide range of data. In the development of SUMPs, data related to the planning context as well as the main challenges and opportunities are essential for determining the appropriate measures. Monitoring and evaluation necessitate regular updates to understand if objectives are being met. The next sections outline challenges to data collection, management and reporting faced by local authorities in Greece. The chapter concludes with a section on recommendations that apply more generally to transport-related data and recommendations that delve deeper into freight data given this emerged as a very challenging area for local authorities

The main data challenges faced by local authorities

Current barriers to data collection at the local level include managing spatial data, data on travel behaviour and data from transport service providers. While several datasets exist at the national level, there are challenges accessing these as well. Collecting freight data remains an even bigger challenge. The root of many of these difficulties can be attributed to constraints in terms of resources and technical capacity.

Spatial data collection and management

Greek local authorities currently collect spatial data and data on infrastructure in a project-specific manner, may it be for the development of specific plans (SUMPs, the Municipal EV Charging Plans, the Municipal Accessibility Plans, or the Municipal Energy Reduction Plans) or as part of infrastructure improvement projects. In this case, data collection is limited to a specific geographic area. All data is typically collected by consultants hired for the project. While in most cases the data is handed over to the municipality, there is difficulty processing and combining this data from varying sources, collected at various points in time, into a cohesive database. In some cases, data was handed over as printed drawings rather than digital files. Where these databases exist, they tend to be outdated due to lack of continued maintenance. The piecemeal collection of data results in uneven coverage across the built-up area of the municipality. In many cases, the city centre is the focus of transport improvements in municipalities. As a result, municipalities are more confident about the availability of data for that area rather than for the whole municipality.

The lack of maintained databases often leads to redundant data collection efforts. Local authorities have reported spending a significant portion of their SUMP budgets on collecting basic data which may have been collected in the past but was no longer available or could no longer be located.

Data collection on travel behaviour

Information on modal share is necessary to track shifts in behaviour and the transition to more sustainable transport modes. Household travel surveys tend to be the most accurate way to obtain data on trip characteristics (travel purpose, time, origin and destination, mode, etc.) as well as socioeconomic data, from a representative sample of the population. Other methods that leverage digital sources (e.g. location tracking via smartphones) do not provide a representative view of the population. However, household surveys can be very resource intensive.

Currently, the approach to household surveys in Greece is fragmented and does not follow a standard surveying frequency due to funding uncertainties. Household travel surveys are usually conducted at two levels. In the context of the SUMP, household travel surveys are carried out at the municipal level to meet the calibration needs if a traffic model is being developed. Typically, there will be no survey if there is no model. Given the cost of carrying out these surveys, there is typically no plan to update these after the SUMP. In the case of strategic planning studies, surveys are carried out in metropolitan areas such as Athens and Thessaloniki, under the supervision of OASA and OSETh (the public transport authorities in each city, respectively). For example, a household travel survey was carried out between 2020 and 2022 in the context of the development of the Thessaloniki Metro. The previous household travel survey in the area took place over 20 years prior.

Notably, local authorities they felt that they lack the procedures to systematically collect data related to public transport. OSETh, for example does not currently have data on public transport demand (origin-destination), they are in the process of developing a data collection framework, working with research institution with the technical capacity for such work. However, even for these authorities with the technical capacity, data collection was considered to be a very resource-intensive task in the SUMP development process, taking up nearly half the budget and time.

Data collection from transport service providers

In order to effectively implement policies and monitor sustainable mobility progress, local authorities need access to operational data from transport operators, including OASA and OASTh in Athens and Thessaloniki, KTEs in most other contexts for urban and interurban transport, as well as other service providers. A common challenge reported by local authorities is the lack of data on public transport and other mobility services, most notably taxi services and increasingly micromobility and other new mobility services. Operators are currently unwilling to share necessary data. In some contexts, KTEs only provide very aggregated data (e.g. number of tickets sold), but no information of vehicle types, or boarding and alighting data, which would be valuable for service planning. Existing data sharing practices are negotiated on an ad hoc basis and largely depend on personal relationships between local authority staff and the operator. Research institutions have also established bilateral agreements with providers. Collecting and sharing the data necessary for planning purposes, but can be resource-intensive, particularly as they require regular reporting, and some operators do not have the staff in place to meet these requirements.

Data collection from national bodies

Outside of data collected by local authorities themselves, the Hellenic Statistical Authority (ELSTAT) is a valuable source of data. While a number of helpful datasets such as vehicle registration and fuel consumption, road crashes, and demographic data can be accessed via special requests to ELSTAT at a suitably disaggregated level, municipalities report long wait times, bureaucratic processes and having to pay for the data as a deterrent. For example, vehicle registration data is publicly available at the regional unit level by vehicle class but does not include disaggregation by powertrain—a crucial variable when monitoring fleet transitions. This extra data, while possible to obtain with registration information, requires a special request. Similarly, population data is available publicly at the municipal level but not at the city block level, which is important for population-weighted understanding of spatial accessibility. Such analysis strikes a balance, allowing comparison across contexts and providing meaningful results for evaluation, without being too computationally burdensome (ITF, 2019). Road crash data is available but details such as whether vulnerable users were involved are not publicly available.

Freight data collection

Obtaining data for analysing and better managing freight flows is a recently emerging practice for local authorities. Consultations with local authorities reveal that they historically perceived freight transport activities to be private sector-led and as such, not in need of specific policy attention to manage flows. Many public authorities, beyond Greece, struggle to manage freight activity due to a lack of in-house capacity and knowledge of how urban logistics functions (ITF, 2022). In part due to this, there is little experience in developing data reporting or sharing mechanisms, or policies such as regulations and incentives targeting freight carriers and receivers.

With changes in consumption patterns, the rise of e-commerce which accelerated during Covid-19, and the advent of newer modes of freight deliveries, local authorities around the world have an increasing need to better understand and monitor freight activity (ITF, 2022). Due to there being little policy interest in the past, there is a lack of systematic freight transport data collection in urban areas in Greece.

Resource challenges within local authorities

All the challenges listed above are exacerbated by a lack of staff resources which was echoed by the national, regional and municipal authorities. The national authorities flagged that they lack an internal mechanism for monitoring and evaluating the progress of implementation for SUMP, in part as there are various gaps in data available at the local level. Many local authorities simply lack the staff resources for data collection and management, which often extends to other domains – not just transport. One local authority noted that none of their current job descriptions include anything related to data, so they often rely on consultants. For example, the municipality of Serres contracts the management of their SUMP database to a third party. However, this approach also comes with challenges, as the contractor then needs to be particularly responsive and aware of various ongoing municipal projects.

The Greek SUMP Law includes the establishment of a National SUMP Platform that hosts open data on the implementation of SUMP, to be updated every two years by local authorities. Despite data sharing being a requirement, there is no penalty for municipalities that do not update their data. The only exception is for TEN-T nodes, which are obligated to collect specific monitoring data under the proposed revision of the TEN-T Regulation (COM/2021/812 final). The proposed regulation specifies that member states are expected to ensure the collection of this data at the local level. Given the lack of standard mechanisms for data collection and management, as well as the understaffing of technical services, the requirement to update the SUMP platform biennially was considered unachievable by many municipalities consulted without additional resources. The upcoming TEN-T Regulation mandates that urban nodes monitor on an annual basis which would be an even larger burden on municipalities that are not yet prepared to gather and report data. Even for those contracting out the task to a third party, those consulted considered it would still be too resource-intensive to procure the services to meet the updating requirements, based on current budgets.

Recommendations for mobility data management

The following recommendations address the general challenges associated with mobility data collection, management, and reporting.

Establish and maintain spatial databases independent of individual projects

At least for the city centre, authorities consulted believed they had spatial data from improvement projects in the area. With startup resources to compile and digitise the available data, a relatively complete database for the city centre could be within the reach of municipalities mandated to develop a SUMP. Coverage should be extended to the rest of the built-up area of the municipality to ensure a clear understanding of needs of all residents—not just those accessing the city centres. Better data coverage is needed not only to inform indicators but to understand the needs and determine which measures to implement in the first place to improve transport options across the municipality. Updates to the dataset can allow the calculation of indicators to track progress from these starting conditions.

As a first step to ensuring spatial and infrastructure data from various projects are compiled, local authorities across all technical departments should systematically include a check-in point at the end of a project within the project contract that ensures the spatial data is transferred in a standard format to ease the compilation of a database. Reducing the data collection burden on individual projects could lead to greater resources for elements such as public consultation or additional data improvements. Much of this data is common across plans that are required by multiple ministries.

Develop or secure adequate long-term technical capacity.

Specialised competencies such as GIS data processing skills are needed to maintain spatial databases, process the data appropriately, and to calculate certain indicators. GIS skills are relevant to the preceding phases of SUMP development as well. Many technical departments lack GIS expertise or have a single staff member supporting all departments. While consultants can be engaged on an as-needed basis, continuous maintenance and updates to GIS databases will be needed to ensure an efficient monitoring process. Such requirements may need to be included in long-term consulting arrangements if a municipality is unable to manage the data compilation and updating process in-house.

Streamline data provision from national bodies.

To keep up with the pace of biennial reporting, it will be necessary to have a streamlined process in place for local authorities to access the required data in a timely manner and decrease the burden on ELSTAT if each municipality separately requests every data set. The MoIT may consider working with ELSTAT to develop a procedure that provides a single point of access for all local authorities requiring data pertaining to SUMPs. This could take many forms. The MoIT may create a list of specifications for the data needed by nearly all local authorities, including names of data sets, level of granularity, spatial coverage, etc. and obtain the data themselves. The data could then be made available to the local authorities. This would require managing a significant quantity of data. ELSTAT could also establish a process themselves that allows faster access to the same data, such as creating a data portal or feeding into one that is already in place. Access to certain datasets can be limited to vetted stakeholders if there are concerns about privacy. Without some simplification and acceleration of the current data request process, the burden of data collection is expected to hinder the ability of local authorities to monitor on a biennial basis.

Existing platforms should be leveraged wherever possible to reduce redundancies and enable more efficient data sharing and data acquisition by local authorities. One such platform is *e-poleodomia* run by the Ministry of Energy and Environment (MoEE) which provides digitised spatial plans for all municipalities. This resource will be helpful for determining the areas of interest and defining boundaries of built-up areas or city centres as part of certain indicators. Municipalities could consider either sharing their road network data with information on speed limits, tactile paving and pavement characteristics with the MoIT and MoEE to expand the function of such a platform, or contributing their data to an open platform such as OpenStreetMap. The National Access Point (NAP) is another example of an existing transport data portal which could play a role in providing better access to transport data in the future. The datasets currently available on the NAP are not sufficient for the indicators, nor is there enough spatial coverage to include all local authorities, but the platform could be expanded to serve this role.

Establish data reporting requirements for transport service providers

Delegated Regulation (EU) 2017/1926 (European Commission, 2017) on multimodal travel information services (MMTIS) requires transport authorities, mobility operators, infrastructure managers and transport on-demand mobility service providers to report data regarding their services to the NAP. This obligation currently concerns static travel and traffic data, as well as historic traffic data. Mobility service operators that hold such data should share it, which would allow a certain degree of monitoring.

To adequately evaluate progress towards objectives and to evaluate whether transport measures are having their desired impact, regular access to data will be vital. Data reporting agreements with transport service providers (including taxis, shared mobility, etc.) should be formalised to ensure consistency and quality in what is being shared. The requirement to report data should be incorporated into licensing agreements so that payment or license to operate is contingent on compliance with the data reporting requirements. This may require the involvement of the MoIT if it implies changes in the legislation. Learning from the successes of bilateral data sharing agreements in Greece between operators, on the one hand, and research groups and local authorities on the other – as shared during the stakeholder consultations-- it is important to build trust and be transparent about the use of the data. Highlighting the advantages of sharing this kind of data and how it helps authorities make better decisions to ensure residents have access to these services is important to get buy-in. The same applies for off-street parking garage operators who can be reluctant to share data. Mandated data reporting should be linked to explicit public policy objectives and authorities should explain why reporting is necessary for meeting the objectives. The purpose for which the local authority is collecting the data should be outlined clearly, publicly, and with reference to the legal basis for data collection (ITF, 2021).

In the case of public transport, incorporating such requirements has been challenging, if not impossible, due to the current monopoly held by KTELs and a lack of staff to monitor and enforce agreements. However, under the Greek Law 4974/2022 (FEK 185/A/29-09-2022), adopted in 2022, public transport services are expected to be contracted at the national level and managed at the regional level. As part of the new tender process, explicit data reporting requirements with specifications on the types of data, granularity, spatial coverage, and frequency of reporting should be included. The national government is expected to be responsible for incorporating this into the contractual obligations, and the regional government may be best placed to ensure compliance if they are managing the contracts for their region. Data from operators may be made available through online platforms such as the NAP which can allow for protected access to local authorities.

Provide national-level guidance on household surveys

Given the importance of tracking modal shares as part of the SUMP and TEN-T regulations, it would be appropriate to establish a regularly administered household survey. For consistency, the design of the survey should be overseen by the MoIT with the support of research institutions. Each regional authority should then coordinate the survey deployment (which may include a public tender for the process), analysing the data, and sharing it with relevant stakeholders (e.g. municipalities and their consultants, metropolitan transport authorities). Regions have more resources than municipalities and by administering it at this level, can capture the inter-urban trips and travel patterns from areas surrounding municipalities. Regions should also share the survey results with municipalities, allowing them to disaggregate the results beyond the metropolitan and municipal level to smaller zones (e.g. traffic zones), which they can also use to calibrate their traffic models, where relevant, or simply understand travel behaviour at a more detailed level.

Regional and local authorities, including metropolitan transport authorities, can provide input into the stratification of the sampling frame. Geographic, demographic, or targeted behavioural stratification can be part of ensuring a representative sample of the population completes the survey. For example, an authority may target a completion rate by administrative boundary population, income level, or by an emerging mode to better understand travel behaviour (Statistics Canada, 2022).

Standardise data collection and indicators at the national level.

For the SUMP platform to provide meaningful insights for local authorities on their mobility measures and allow benchmarking, the onus will be on the national authority to standardise data collection practices and indicators, with consideration of TEN-T indicators alongside national requirements, when they become available. This approach can also help to integrate the use of indicators in the public administration process and normalise the sharing of data amongst authorities and private entities involved in SUMP delivery. As part of this project, ITF proposes an indicator framework to support the national government in developing a system to monitor progress of urban mobility objectives at the local level. The last chapter describes a framework to support standardised monitoring practices. The framework is accompanied by an Excel-based tool that proposes a set of calculators and reporting templates to make the process more accessible and easier to implement for municipalities and regions. They may serve as a template for an online version to ease indicator reporting. The national authority also has a role to play in making the process more accessible and easier to implement, through capacity building activities such as knowledge sharing and developing templates, or through partnerships with research institutions. All expectations of the local authorities to contribute to the indicators on the SUMP platform will need to be paired with adequate resources and funding to ensure that they are equipped to comply with expectations.

Recommendations to understand and monitor urban freight activity

Tracking the impact of more sustainable freight measures will require obtaining data on freight transport demand, freight service supply, infrastructure and vehicle fleet. Freight demand data includes information on freight receivers delivery needs, such as weekly received loads per commodity type. Freight service supply can include information on carriers' vehicle flows, for instance on operators' driving and delivery practices, including on how they deliver goods and the level of noise observed. Infrastructure information

refers to data on availability of (un)loading spaces and their characteristics, as well as on-street access requirements for various vehicle types. Vehicle fleet can include data on vehicle characteristics (ITF, 2022).

In most cases, freight-relevant data is not systematically generated or gathered by local authorities. Local authorities can lack in-house resources to gather and analyse data, as it can be time or cost intensive. More affluent municipalities could generate data through the use of sensors and other information and communication technology applications (ICTs), but this is not a common practice in the Greek context. Even when available, ICT data, for instance on vehicle flows, is not enough to provide a full characterisation of the sector, nor of the impact of sustainable freight policies.

Since urban freight mobility was highlighted as a challenging area for local authorities during consultations, this section delves deeper into how they can overcome challenges in collecting data in a fragmented and still private sector-led sector.

Cooperate with freight stakeholders to address data gathering challenges

To obtain a full picture of freight activity, authorities need to collaborate with the various stakeholders who generate or have relevant data. Table 1 gives a general idea of the types of data that authorities could use to better understand the sector and assess the impact of sustainable freight policies, as well as potential stakeholders who could provide them. It includes data on freight transport demand (which goods need to be received); service supply (how goods are delivered); the available infrastructure for facilitating deliveries; and freight vehicles (ITF, 2022). Relevant stakeholders include freight carriers, who use vehicle fleets to make deliveries, freight receivers, who generate demand, driving training centres and research institutions that study freight activity. In the public sector, local authorities could also benefit from collaborating with other municipalities, regions and national institutions, to obtain relevant data. The table is a heuristic tool showcasing, among others, data inputs that feed the freight-relevant transport indicators proposed as part of the monitoring and evaluation framework presented in the final chapter of this report. The table is not exhaustive. Authorities may choose to integrate other data inputs and relevant stakeholders, depending on their priorities and implemented measures, as well as on data availability and data collection capacity.

Efforts will be required to engage with and gather data from freight carriers and receivers. There are no legal data reporting requirements for these stakeholders to share data with local authorities under current legislation. Carriers and receivers alike might not see the point in investing resources to share data with authorities without clear benefits for them. Because of this, authorities need to convince carriers and receivers alike to share data in a regular and streamlined manner which can take considerable effort.

Studies with focus groups of freight carriers have shown that carriers are willing to share data provided certain conditions are met. They need to see the value in sharing data which requires understanding their personal benefits and a clear framework for the use of data that specifies how it will be used and boundaries to this use. They need to preserve their competitive advantage; therefore, carriers want to know that the data will be secure and provided at a sufficiently aggregated level of detail, and they want to feel that all carriers are contributing (not just them). Lastly, they need to be able to easily obtain the data without dedicating extra resources (Laegran et al., 2023).

Building the conditions for effective data reporting sharing with private stakeholders requires trust. Creating dialogue spaces with freight stakeholders could help build this trust. Authorities could organise biannual or annual dialogues with the support of local chambers of commerce which could serve as platforms where authorities could explain the benefits that sharing data could provide, address the kinds

of conditions mentioned above, and permit stakeholders to voice concerns. Some concerns include worries over data privacy and over the use of shared data to inform policies restricting freight activities, for instance through more stringent off-peak hour delivery obligations (ICLEI, 2021). Benefits that could be highlighted include direct impacts from policies developed with the support of shared data, for instance improvements in travel times resulting from less congested freight flows or higher availability of (un)loading infrastructure.

Authorities also need to set clear partnership agreements on data sharing, with private freight stakeholders (Moschovou et al., 2019). Agreements specifying data use and sharing conditions, as well as data format specifications help private stakeholders better understand and act upon data sharing requests by authorities. Similar to best practice for passenger modes, all data requests should have a legal basis, pertain to public policy objectives, and clearly outline the reasons for requesting the data (ITF, 2021). Receiving data sets in standardised formats is more efficient and reduces time resources for data processing and analysis by the local authorities.

Table 1. Types of data to support understanding and monitoring of sustainable urban logistics and potential stakeholders that may generate or collect the data

Data category	Type of data	Stakeholders who could generate or collect the data
Freight transport demand	Location of freight receivers	Municipal authorities may be aware of local sites that attract freight deliveries (e.g. commerce, public institutions, offices).
	Demand generation by freight receivers	Freight receivers can be surveyed to understand demand volumes and patterns. Research centres may have historic data from past studies or surveys to understand demand generation.
	Demand preferences of freight receivers (such as delivery times or vehicle choice preferences)	Freight receivers can be surveyed to understand demand volumes and patterns. Research centres may have historic data from past studies or surveys to understand demand generation.
Freight transport service supply	Freight vehicle flows (for a given time and location)	Freight carriers should have data on vehicle flows (ranging from trip logs, to real time GPS-tracked flow). Research centres may have historic data from past studies or surveys.
	Partnership arrangements by freight carriers	Freight carriers can be surveyed to understand whether they have partnership agreements (eg. to share warehouse spaces, trucks etc.).
	Vehicle preferences by mode and route of freight carriers.	Freight carriers can be surveyed to understand their modal preferences and how these may differ by route.
	Skill and training level of freight drivers	Freight carriers should retain records with respect to their employed drivers to track completion of drivers' training, specialised training for undertaking nighttime deliveries, eco-driving etc. Training centres may be able to provide aggregate data. National authorities in charge of driving licences should have access to data regarding training requirements that are part of licencing.

Data category	Type of data	Stakeholders who could generate or collect the data
Freight transport infrastructure	Location, capacity and use of freight depots (transshipment and/or consolidation centres)	Freight carriers can be surveyed to understand the locations and their use of freight depots. Municipal and regional authorities should know the location of most freight depots, though sometimes operations can occur in warehouse spaces that may not be specifically demarcated as consolidation centres/transshipment centres.
	Location, capacity and use of freight (un)loading bays	Municipal authorities will know the locations and capacity of these spaces. They can use sensors to understand the occupancy of bays, but depending on the level of illegal parking (by passenger vehicles), these sensors may not always give an accurate picture. Without sensors authorities may carry out observational surveys, partner with law enforcement to track illegal use of bays or collaborate with freight receivers if located close to bays to obtain observational data. This would not be real time data and would require investment in personnel. Freight carriers can be surveyed to understand how often they use these spaces.
	Location, capacity and use of micromobility infrastructure for cargo bikes and light delivery vehicles	Municipal authorities will know the locations and capacity of these spaces. They can use sensors to understand the occupancy of certain parking areas, but depending on the level of illegal parking (by passenger vehicles), these sensors may not always give an accurate picture. Without sensors authorities may carry out observational surveys, partner with law enforcement to track illegal use of bays or collaborate with freight receivers if located close to bays to obtain observational data. This would not be real time data and would require investment in personnel Freight carriers can be surveyed to understand how often they use micromobility infrastructure for logistics.
	Charging infrastructure availability within freight depots	Freight carriers will know the availability for charging infrastructure at depots and can be surveyed. Municipal authorities will often need to be involved in permitting processes for charging infrastructure installation and therefore should maintain a record.
Freight transport fleet	Vehicle fleet characterisation (vehicle type, model, age, fuel technology)	Freight carriers will have all details with respect to their fleet and can be surveyed or asked to share data. National authorities (ELSTAT) will maintain data related to vehicle fleets and registration. The Ministry of Infrastructure and Transport can provide aggregate data upon request. Regional authorities manage vehicle registrations and therefore have access to the vehicle characteristics.
	In-vehicle technologies	Freight carriers will have all details with respect to their fleet and installed technologies and can be surveyed or asked to share the data.

Use surveys to collect freight data for indicators

Given the current lack of data, monitoring and evaluation of the freight sector is not possible without the generation of new data. While data-sharing agreements may be ideal, they will take time to establish. This project did not undertake a comprehensive review of all freight data collection methodologies and their applicability to the Greek context. Rather, to minimise the data collection burden, the freight-relevant indicators suggested in the final chapter are designed to rely primarily on data that could be collected by developing biennial regional surveys targeting freight carriers. Carrier surveys have been used in many European cities to obtain the types of freight data required for these indicators, though not always on a consistent basis (van den Bossche et al., 2017). Survey results would allow comparison across regions and help track national objectives at regular intervals. The indicator fact sheets provide further details on possible questions to include in the survey relevant to each indicator. This section provides an overview of the proposed surveys which are structured similarly to the recommendations for a nationally coordinated household passenger travel surveys at regular intervals. While regular household passenger travel surveys exist at the national level in many countries, there are few examples to draw from at this time on regular freight surveys given it is still a relatively new focus in transport planning and policy. National coordination is recommended to minimise redundant efforts regions may experience in undertaking this work individually.

Similar to the household surveys, regions would be an appropriate scale for carrying out surveys, as freight carriers often deploy their activities based on region-wide flows. Regions also have more in-house resources than municipalities to administer the survey. Depending on the questions included in the survey, the obtained data could also benefit municipal authorities (especially where they are in charge of policy measures affecting urban space, such as those addressing off-peak deliveries and the management of curb space). The results should ideally allow them to track challenges and opportunities for implementing measures at the municipal level.

Cooperation across multiple administrative levels would be needed to run representative surveys in the Greek context. First, national authorities would be best placed to develop a standardised methodology that all regions can use and which aims for representativeness in results (Sakai et al., 2015). To address this challenge, national authorities could partner with a relevant research body to explore survey methodologies that could fit the Greek context and data collection needs. In partnership with this institution, they could select and streamline a survey process that minimises resource intensity, ensures representativeness, and which can be deployed by regional authorities across the country. A core set of survey questions could also be defined at the national level and added to by regions as they see fit to ensure consistency when it comes to the basic data required for the indicators.

Authorities will also need to identify a sample and maximise response rates from carriers (Sakai et al., 2015). Regional authorities do not always have registries to help identify a proper sample of freight stakeholders nor do they consistently have ways to contact them. To overcome this challenge, regional authorities could request data from national and municipal registries allowing them to identify the freight carriers and receivers operating in the region, their characteristics, as well as contact details. Partnering with local chambers of commerce could also be a way to increase survey response rates. The suggested dialogues between freight stakeholders and local authorities could also be used to launch the surveys and encourage responses.

In addition to surveying the freight carriers, some of the suggested indicators focus on freight receivers to provide additional insights. Given the freight receivers are much more localised and can be attributed to a single municipality, municipal authorities are well placed to collect this data. This may be a short online survey, or simply a phone call to collect the kind of data required.

Choosing urban transport policy measures for SUMPs

In support of the Greek national government's pursuit of sustainable urban mobility, ITF developed a measure selection tool designed to aid local authorities in choosing appropriate transport policy measures for their specific urban contexts. The tool would be of most use during the *Elaboration* phase, specifically during Stage 4 where measure packages are meant to be defined and assessed, according to the Greek SUMP law (see Figure 4). It may be a useful starting point for consultants that are advising local authorities, but the primary intended users of the tool are local authorities themselves. It is an educative resource to help local authorities understand what a shortlist of suitable measures for their context might look like. It can help them participate effectively in defining the measures alongside other experts. The content can also be helpful in informing scenario design or defining objectives in prior stages if the local authority wishes to understand what kind of actions may be needed to achieve a desired future scenario when prioritising objectives. The tool was developed based on international good practice, tailored to the Greek context based on a detailed survey and stakeholder consultations with representatives from each Cleisthenes urban area type, regions, freight stakeholders, academia, transport professionals, and the national government.

The tool, built in MS Excel, provides fact sheets for 24 mobility measures encompassing 78 sub measures designed to address the objectives of the Greek SUMP law and other mobility guidelines. The relevance of measures or sub measures to certain areas are classified based on a variation of the Cleisthenes types which is explained below. This chapter describes the tool, how it is organised, and how it can be used. An online version of the tool could be made accessible via the national SUMP platform to ensure ease of centralised updates and allow easy access to authorities. The platform has been issued a ministerial decision (FEK 1735/B/19-3-2024) and will be managed by the MoT. The data is intended to be available online for all local authorities to access.

This chapter also discusses the measures in general terms based on policy category, sector, relative cost, implementation timescale and level of national involvement along with possible sources of funding that can support implementation of the measures. For details on each measure, please refer to the tool available at: [Advancing Sustainable Mobility in Greece: Supporting SUMPs uptake | ITF \(itf-oecd.org\)](https://www.itf-oecd.org/advancing-sustainable-mobility-in-greece-supporting-sumps-uptake)

The objectives of SUMPs and mobility measures

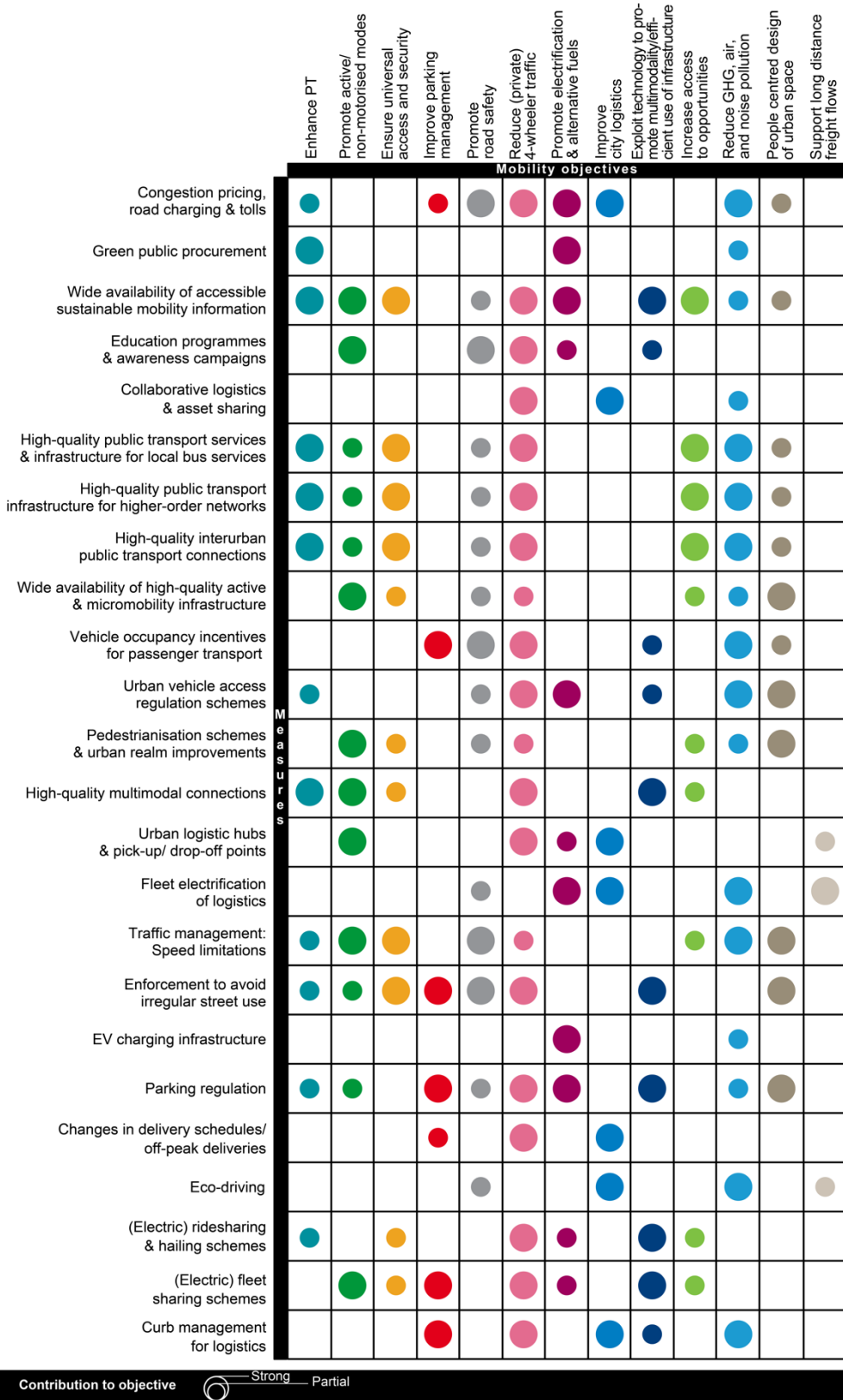
Local authorities develop SUMPs to meet mobility objectives to improve environmental, social and economic sustainability. The measure selection tool suggests measures that help address the following objectives as defined in the SUMP law, and subsequent guidance from the EU Urban Mobility Framework. These goals are summarised in Table 2.

Table 2. Mobility objectives according to the Greek SUMP law and the EU Urban Mobility Framework

Greek SUMP Law (4784/2021) objectives	EU Urban Mobility Framework objectives (additional to the SUMP law)
<ul style="list-style-type: none"> • enhance public transport • promote active/non-motorised modes • ensure universal access and security • promote road safety • reduce private four-wheeler traffic • improve parking management • promote electrification and alternative fuels • improve city logistics • exploit technology to promote multimodality/efficient use of infrastructure 	<ul style="list-style-type: none"> • increase access to opportunities • reduce greenhouse gases, air, and noise pollution • people-centred design of urban space • support long distance freight flows

The applicability of each measure to the mobility objectives are illustrated in Figure 25. Reducing private car use is directly addressed by 17 of the 24 measures and partially addressed by three additional measures. This objective is central to sustainable urban mobility and therefore has many relevant measures. Reducing greenhouse gases, air, and noise pollution follow reducing car use as a core objective targeting transport's impact on the environment and health. Other objectives can be more specific and therefore have fewer measures impacting them, but each of the objectives are the direct target of at least one measure. The tool demonstrates that sustainable mobility clearly needs a package approach to measures in order to tackle all mobility objectives; no one measure can tackle them all. Furthermore, some measures have a strong impact on some objectives while having a secondary, or partial, impact on others. If local authorities have certain priority objectives, they can filter measures within the tool that contribute strongly to their desired objective. By doing so, local authorities can customise the subset of measures suggested by the tool to reflect their priorities.

Figure 25. Sustainable urban mobility measures and the objectives they contribute to

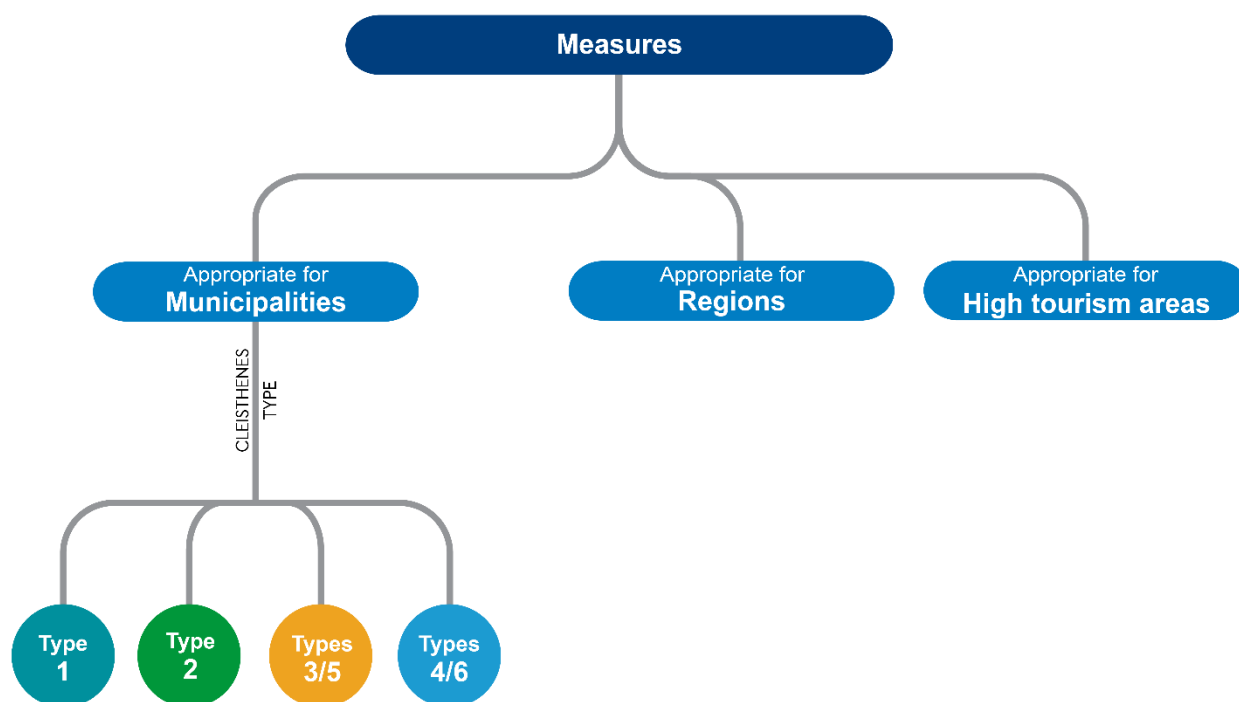


Classification of measures by area types

The analysis carried out in the second chapter highlighted that the classification of the Greek municipalities, introduced by the Cleisthenes reform, is a solid basis. This classification effectively addresses the complexities and diversity between Greek cities, resulting in six types that group municipalities with similar characteristics and needs. Although each type of municipality is unique in its own way, some are more closely connected, encountering similar challenges and seeking common solutions, especially when it comes to mobility. The analysis of SUMP development by municipality type, presented in the second chapter, further supports this finding.

To help local authorities choose the most appropriate measures for their area, the tool introduces a slight modification to the existing Cleisthenes classification. Measures are classified as being relevant for regions, municipalities of Type 1, Type 2, Types 3 and 5, and Types 4 and 6. There is an additional category, denoting whether measures are more relevant in municipalities of high tourism (regardless of type) or not. The measure classification system is presented in Figure 26.

Figure 26. Measure classification system based on area types.



Measures that are appropriate for regions are typically applied at the regional level. This includes measures such as inter-urban public transport where the decision making and application lies heavily with the regional authorities. Other measures, such as local public transport may also require support from regions with respect to decision making, funding etc., while their application rests at the municipal level ; in those cases, measures are not classified as a regional measure. Many measures are relevant for certain types of municipalities as well as regions, such as multimodal connectivity which should be co-ordinated between both municipal and regional authorities throughout a region.

Measures appropriate for the municipal level are first classified according to their Cleisthenes type. Types 3 and 5 are grouped together, as are Types 4 and 6. This is because Types 3 and 5 municipalities share similar demographic and environmental characteristics, and both have medium technical capacity. They also deal with fewer congestion-related mobility issues and have lower density than Types 1 and 2. Similarly, Types 4 and 6 have comparable population and built environment characteristics, face the most significant accessibility challenges due to their remoteness/low population density, and have very limited capacity to address even basic mobility-related issues. Given Type 4 and 6 municipalities are not required to develop SUMPs by law and are typically rural settlements. Regions that encompass many Type 4 and 6 municipalities may consider supporting the implementation of such measures through their regional SUMPs.

The tool also includes a binary classifier related to tourism which applies horizontally for all urban area types. Some measures are especially relevant for municipalities with high tourism, regardless of their size. For example, curb management for urban logistics is important in Type 1 and Type 2 municipalities to manage the use of (un)loading bays efficiently. It may not be relevant for smaller municipalities, unless they are areas dealing with a high influx of tourism. During high season, it may be prudent to apply curb management measures especially in congested historic city centres. Measures where there is likely no differentiation needed according to level of tourism are not classified as relevant for high tourism areas.

In addition to tourism, island geography impacts mobility conditions and, therefore, the way in which mobility measures should be applied. The analysis presented in the second chapter demonstrates that, municipalities of all types attract tourism flows, while island municipalities are found in Types 2, 5 and 6. Tourism flows influence the choice of measures as well as when or how it is applied, as explained in the curb management example. Island geography does not play a significant role in the selection of appropriate measures. All the measures are relevant for islands, however, applying certain measures in island settings introduces particularities or challenges that need to be addressed. For example, multimodal connectivity on islands (and coastal municipalities) should consider connections to ports very strongly if this is the main access to the island.

What are the transport policy measures?

The tool includes 24 policy measures. Some are more straightforward and display a limited diversity in application; this is the case of traffic management using speed limits, for instance. Others involve several actors and could take several different forms, such as fostering urban logistics hubs. Where measures encompass multiple possible interventions, they have been split into sub measures adding up to a total of 78. Measures can address only the passenger sector, the freight sector, or both and are classified based on the policy category, relative cost, implementation timescale and level of national involvement. These measure characteristics are summarised in Figure 27.

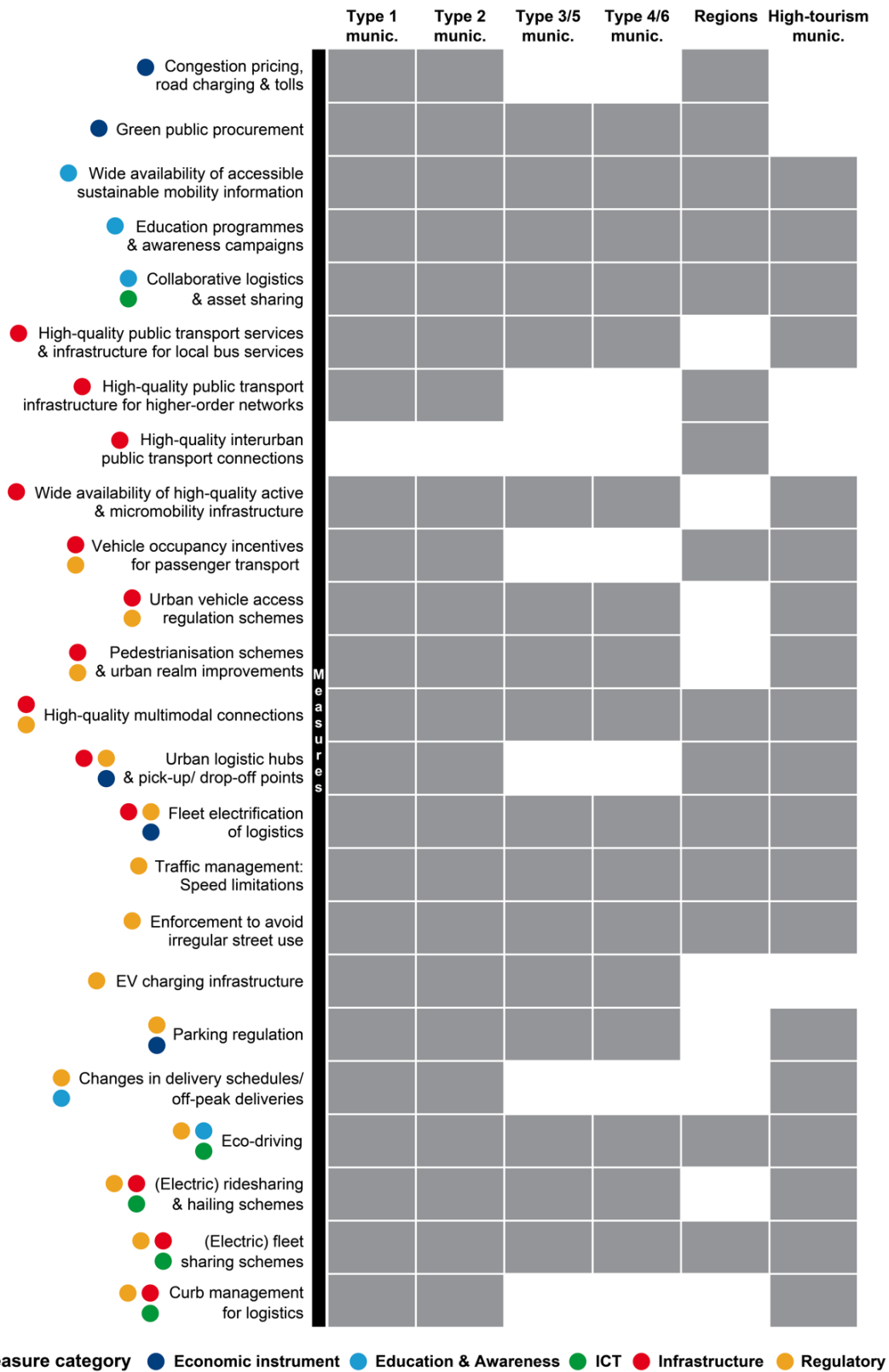
Policy categories refer to the way policies support more desirable behaviour such as those that improve sustainability, safety, well-being, etc.

- **Economic measures** involve financial incentives or disincentives to choose more desirable transport choices (eg. congestion pricing, road charging and tolls). Disincentives, especially, can be more controversial to implement though they are typically highly effective. When implementing economic measures, authorities must take into account distributional impacts and ensure that economic burdens do not fall unfairly on certain groups.

- **Regulatory measures** restrict or impose limits on less desirable actions by law (eg. parking regulation, urban vehicle access regulations). Regulatory measures can also be controversial as they can curtail behaviours that are currently commonplace. They may also be paired with economic measures, by imposing fines or charges on behaviour that is not congruent with the regulation (eg. diesel vehicles entering a low emission zone may be required to pay). Regulatory measures need to be paired with enforcement for them to be effective.
- **Education and awareness measures** improve public knowledge of more desirable transport choices or increase confidence in them (eg. enhancing sustainability information and accessibility). Implementation of most mobility measures should be paired with education and awareness measures to inform the public of how they may be affected and how to comply. Education and awareness alone is not an effective way to encourage more sustainable mode choices; adequate services and infrastructure must also be in place.
- **Infrastructure measures** involve construction or conversion of infrastructure for a purpose that improves conditions for desirable transport behaviours (eg. increasing and improving active and micromobility street space and related infrastructure). Converting infrastructure dedicated to less sustainable modes and allocating it to more sustainable ones, can be an efficient way of incentivising mode shift.
- **ICT/Innovation/R&D measures** are typically dependent on new technologies and tries to leverage or develop them to support more desirable transport choices or improve services/operations (eg. collaborative logistics and asset sharing in urban freight). This category of measures includes vehicle technology improvements which have a direct impact on sustainability, safety, etc. They also include digital tools that, for example, allow more efficient use of existing vehicles.

The tool also offers a qualitative indication of the relative cost, implementation timescale, and level of national involvement to provide a quick snapshot of the challenges to implementation. However, these classifications should be considered extremely high level and significantly variable depending on exactly how a measure is applied. There are numerous actions local authorities can take depending on their individual characteristics, needs and resources. The full measure factsheet, included in the tool, provides a thorough understanding of elements to consider.

Figure 27. Sustainable urban mobility measures included in the measure selection tool and their relevance to different urban area types and their measure category



Each of the measure factsheets includes a reader’s guide at the top with the applicability of sub-measures by urban area type. It is followed by a summary with a description of the measure and its sub measures. It provides a non-exhaustive overview of the types of costs that may be incurred and will need to be planned for during implementation, operation and beyond, as well as how the local authority may fund the measure. This is followed by an evaluation of non-financial challenges to implementation. The summary concludes with potential direct or indirect impacts and a list of complementary measures that may be relevant to implement together or at least consider for greater impact.

The second section qualifies the measure in greater detail. The sample costs section draws from case studies, where available, to provide an indicative example of costs from past projects. Implementation timescale rating qualitatively reflects the length of the implementation process due to wider involvement of stakeholders, regulatory requirements, technical difficulty, etc. The level of national involvement is also qualitatively determined to indicate where national support will be imperative for a measure’s success. In some cases, the necessary national involvement describes an existing process, and in others describes actions that may be necessary in the future. A summary of these actions for each measure are found in Annex 1. Local authorities will need to keep in mind that local conditions and market factors will influence the actual costs and timelines, and should only think of these as indicative guidelines.

The Excel tool: Sustainable Urban Mobility Measure Selection Tool for Greece

The accompanying Excel-based tool, the “Sustainable Urban Mobility Measure Selection Tool for Greece”, to aid local authorities in selecting appropriate transport policy measures based on their specific urban contexts during their SUMP development process. It allows users to filter based on desired criteria to determine a short list of possibly appropriate measures for their urban area type, that address their mobility objectives.

The classification of measures by urban area types attempts to identify possible solutions to common mobility challenges typical of an urban area type. However, it is essential to note that each municipality has unique circumstances and constraints, and no classification can thoroughly address the complexities and diversity between Greek municipalities. The tool presents various alternative mobility measures, but how they are ultimately implemented will need to be customised by local authorities. Classification of a measure as relevant for a type of urban area does not mean it would be applicable to all municipalities of that type.

No one measure addresses all mobility objectives, nor are all measures appropriate in all circumstances. The tool demonstrates that a package approach is needed for sustainable mobility policies. Local authorities are encouraged to use this tool after a thorough needs assessment that informs their priority areas and helps identify the suitability of certain measures over others. This tool is meant to be educational, not prescriptive. It is not a substitute for in-depth analysis of unique local circumstances.

Overview of the tool

When opening the tool, the user is first presented with a “Home” sheet which provides an introduction and describes the sheets contained in the tool as well as a brief project description. It also includes the urban area classification that is used to classify the relevance of measures for certain urban areas.

The “Measures” sheet lists all measures and sub-measures (and their codes) and includes links to their fact sheets.

The “Overview_Measures” sheet summarises all the characteristics of the measures and sub-measures based on their relevance for a specific urban area type, measure category, relative cost, implementation timescale, level of national involvement, and its applicability to certain mobility objectives. The “Measure_Selection_Filter” sheet allows users to filter the full list of measures based on the same criteria.

The following sheets labelled by three-letter measure codes contain the fact sheets for each measure. Each fact sheet includes a reader’s guide at the top indicating the applicability of sub-measures by urban area type. This is followed by a summary description of the measure and its sub-measures and a non-exhaustive overview of the types of costs that may be incurred and will need to be planned for during implementation, operation and beyond, as well as how the local authority could fund the measure. This is followed by an evaluation of non-financial challenges to implementation. The summary concludes with potential direct or indirect impacts and a list of complementary measures that may be relevant to implement together or at least consider for greater impact.

The second section of each fact sheet describes the measure in greater detail. Sample costs are drawn from case studies of past projects, where available. An implementation-timescale rating qualitatively reflects the length of the implementation process due to such factors as the involvement of stakeholders, regulatory requirements, and technical difficulty. The level of national involvement is also qualitatively determined to indicate where national support will be imperative for a measure’s success. Local authorities will need to keep in mind that local conditions and market factors will influence the actual costs and timelines and should only think of these as indicative guidelines.

Access the Sustainable Urban Mobility Measure Selection Tool for Greece

Download the tool via the ITF website:

[Advancing Sustainable Mobility in Greece: Supporting SUMPs uptake | ITF \(itf-oecd.org\)](#)

Funding the implementation of SUMP measures

Funding the implementation of sustainable transport measures can require a variety of schemes. Funding may come from the local, national and EU level.

Local governments can consider prioritising sustainable mobility measures and initiatives using their own budgets, which may prove difficult given local budget constraints, or through revenue generated through the implementation of certain economic and regulatory mobility policies. Funds from road pricing, parking pricing, and enforcement may be used to invest in sustainable transport initiatives.

The Green Fund of the Greek national government disburses funds coming from environmental taxes and fees to support programmes, measures and projects aimed at improving environmental sustainability. It has funded several of the current SUMP development efforts and is also relevant for local authorities when implementing SUMP measures (EU, 2019).

The national government also approves funding via the Partnership Agreement (PA) on EU funds with Greece for 2021-2027. It is the primary strategic fund for the country's development projects. It aims to address structural weaknesses that led to the 2009-2018 economic crisis in Greece, and the economic and social consequences that ensued. It is implemented with significant EU resources from the European Regional Development Fund, the Just Transition Fund, the Cohesion Fund, and the European Social Fund+ as well as the European Maritime, Fisheries and Aquaculture Fund. The PA for 2021-2027 provides funding for investments in smart technology, clean energy, road and digital networks which all pertain directly to

transport, as well as policies that support employment, small and medium-sized enterprises, social inclusion, and the fight against poverty.

Additionally, the European Commission funds research projects and co-ordination on sustainable mobility within its primary funding programmes, Horizon Europe and Interreg. The European Union offers various funding tools for sustainable urban mobility, including (Interreg Europe, 2018; Werland & Rudolph, 2019):

- **Horizon Europe:** Successor to Horizon 2020 which had a budget of nearly EUR 95.5 million, Horizon Europe is the EU's primary funding program for research and innovation, with a focus on tackling climate change, the UN Sustainable Development Goals, and boosting EU's economic competitiveness. The programme is in place 2021-2027 (EU, 2023a).
- **Interreg:** A crucial program co-funded by the EU that provides project funding to support co-operation across member states. Its main objective is to address common challenges and discover shared solutions in various fields such as health, environment, research, education, transport, sustainable energy, and more (EU, 2023b; Interreg Europe, 2023).
- **Cohesion Policy – European Structural and Investment Funds (ESIF):** The European Structural and Investment Fund (ESIF) is composed of five distinct funds, with the European Regional Development Fund (ERDF) and Cohesion Fund being particularly relevant for urban mobility projects (European Commission, 2021c). The ERDF aims to encourage balanced development in all regions of the EU (European Commission, 2021d). The Cohesion Fund supports investments in priority trans-European transport networks, including low-carbon transport systems, to promote sustainable regional and local mobility. This fund is targeted towards Member States whose Gross National Income (GNI) per inhabitant is less than 90% of the EU average (European Commission, 2021b).
- **Connecting Europe Facility (CEF):** A fund for pan-European infrastructure investment in transport, energy and digital projects, aiming for greater connectivity between member states. The new CEF programme seeks to shift the focus to decarbonisation and make transport connected, sustainable, inclusive, safe and secure (European Commission, 2021a).
- **Jaspers:** Provides technical assistance to prepare high-quality significant projects financed by the ERDF and Cohesion Fund, including CEF projects. Jaspers' experts provide independent, hands-on support on strategies, programmes, and projects to ensure the EU-funded investments promote growth and sustainability, connectivity and innovation in Europe (Jaspers, n.d.).
- **InvestEU:** A programme that boosts European investment, innovation and job creation over 2021-27. InvestEU will support the Green Deal Industrial Plan to enhance the competitiveness of Europe's net-zero industry and the fast transition to climate neutrality. Apart from funding, Invest EU provides advisory support and technical assistance through the InvestEU Advisory Hub and matchmaking and networking opportunities through the InvestEU Portal (European Union, n.d.).
- **Digital Europe Programme:** A new EU funding programme aiming to accelerate Europe's digital transformation, bringing technology to businesses, citizens, and public administrations to aid economic recovery following the COVID-19 pandemic (European Commission, 2022b).
- **Innovation Fund:** One of the world's most extensive funding programmes for innovative low-carbon technologies. The Innovation Fund focuses on funding technologies and flagship projects that have the potential to significantly reduce emissions. The EU Emissions Trading System (EU ETS) - the world's most extensive carbon pricing system that controls emissions from roughly

10,000 energy and manufacturing facilities and airlines operating between EU countries –funds the Innovation Fund (European Commission, 2023).

- **The Just Transition Mechanism:** A framework to assist regions that rely heavily on fossil fuels to manage the economic and social consequences of transitioning towards a more sustainable economy. As part of this framework, EU member states are given dedicated financial resources and technical support, with the condition that they create national just transition plans. The framework includes a 17.5 EUR billion Just Transition Fund and 13.3 EUR billion in grants and loans through other channels to support just transition programs and investments (European Commission, 2021e). Accessing funds via this mechanism requires significant national involvement but may be applicable for regions implementing sustainable mobility measures.
- **Social Climate Fund (SCF):** A dedicated fund that will assist Member States in providing direct support to the most vulnerable groups, such as households that experience energy or transport poverty, during the green transition. Member States can use SCF to support investments in energy efficiency, building renovation, clean heating and cooling, renewable energy integration, and low-carbon mobility solutions. SCF has set a target of mobilising a minimum of EUR 86.7 billion between 2026 and 2032 (European Commission, n.d.-a).
- **Recovery and Resilience Facility (RRF):** The largest EU funding programme at the time of launch, providing grants and loans to Member States. The RRF regulation was implemented in February 2021 and required Member States to develop a National Recovery and Resilience Plan (NRRP) outlining the investments and reforms they intend to make. Greece’s NRRP, “Greece 2.0”, was adopted in July 2021, and a revised version was approved in December 2023, amounting to EUR 34.95 billion to support 103 investments and 76 reforms. Funding under the RRF is open until 2026 and some of it is open to municipalities in certain cases (eg. the “Smart Cities” initiatives). In other cases, funds are distributed to a ministry (such as the Ministry of Interior) who may disburse the funds to municipalities (Ministry of Finance Recovery and Resilience Facility Agency, n.d.).
- **Technical Support Instrument (TSI):** An EU programme providing technical assistance to Member States to develop and implement reforms. Member States can request technical assistance for a variety of policy areas, many of which intersect with transport policy. Annual requests must be submitted in October each year. Support can be provided through the European Commission’s in house experts or external providers, as is the case for this project which is funded by the TSI (European Commission, n.d.-c).

Beyond local, national and EU funds, local authorities may seek alternative financing options (e.g. loans, green city bonds, public-private partnerships) though they will also need to carefully consider risks and benefits of such schemes.

How can local and national governments evaluate progress towards sustainable mobility?

The Greek SUMP Law 4784/2021 (FEK 40/A/16-03-2021) establishes the importance of monitoring Sustainable Urban Mobility Plans (SUMPs) at the onset. Following the preparation (Phase 1) and elaboration (Phase 2) of the SUMP, monitoring and evaluation makes up the third and final phase of the SUMP development process according to the law. Local authorities who are obliged to create SUMPs must also submit biennial progress reports with updates to the indicators included in their SUMPs. These results are to be submitted and accessible via a national SUMP platform, which is under development and managed by the MoIT. The data is intended to be available online for all local authorities to access.

The main goal of the MoIT in including the monitoring and evaluation mandate is to establish a culture of data-driven policymaking, evaluation and continuous improvement at the local level. At the national level, a standardised indicator system will allow benchmarking and comparisons between the progress of individual authorities to identify where support is needed. The mandate to monitor is not yet tied to funding for SUMP measures due to the complex nature of funding streams, as multiple ministries may often be involved. Nor are there explicit consequences for failing to report.

In addition to the biennial reporting requirements of the SUMPs, according to the amended proposal for the TEN-T regulation (COM/2022/384 final) municipalities that make up urban nodes of the TEN-T network will also have annual reporting requirements. The indicators will be a revised set of Sustainable Urban Mobility Indicators (SUMI). The final indicators and methodology are not yet available, and will be published in an Implementing Act which is to be adopted following the publication of the revised TEN-T regulation (European Commission, n.d.).

The ITF, in the context of the EU-funded project, *Recharge and Refuel – Clean, smart and fair urban mobility*, developed a monitoring framework consisting of two indicator systems to support the MoIT in developing standardised monitoring practices. Indicators are single numerical values calculated using a combination of data sources that can be used to evaluate progress towards a certain objective or target. . The framework considers the SUMI used in the EU’s first set of SUMP guidelines (Rupprecht Consult et al., 2020), examples from current Greek SUMPs, indicators that are prevalent in related literature and also considers the priority areas according to the European Commission which are expected to be reflected in the TEN-T reporting requirements. These include indicators on congestion, greenhouse gases and pollution, road safety, modal share and access to mobility services (European Commission, n.d.). It is informed by the local authority survey and online consultations ITF carried out for the project, as well as a series of in-person consultations with a range of authorities of different urban area types and the MoIT with a focus on monitoring and evaluation. These consultations were especially useful in understanding the roles different bodies may play, the feasibility challenges and the priorities of local authorities. Local authorities themselves have expressed a desire to have a standardised framework in place at the national level for SUMPs so that a base set of indicators can be used for all SUMPs.

The monitoring framework includes one indicator system that monitors progress towards mobility objectives, the Objective-Specific Indicator System (OSIS), and one that measures the impact of individual transport measures, the Measure-Specific Indicator System (MSIS). For ease and to ensure the efficient use of resources, the systems use as many common indicators as possible. The systems are presented in the rest of this chapter and in the accompanying Excel-based tool (the Sustainable Urban Mobility

Monitoring and Evaluation Tool for Greece) which includes factsheets on each indicator as well as templates to automate their calculation and reporting. In the long-term, the reporting of indicators is expected to be done online via the national SUMP platform to ensure ease of centralised updates and allow easy access to authorities. The platform has been issued a ministerial decision (FEK 1735/B/19-3-2024) and will be managed by the MoIT. This chapter introduces proposals for the monitoring and evaluation framework, and describes the two indicator systems that make up the framework. It concludes with an overview of the accompanying tool.

Developing a realistic and robust monitoring and evaluation framework

The indicators included in the OSIS and MSIS prioritise simplicity in terms of data collection and calculation, while still providing insights to track progress and allow all responsible parties to establish a monitoring practice. Ideally an indicator system would have as few indicators as possible, the indicators would be as robust as possible, and the data required to collect the indicators would be as simple as possible. It is difficult to optimise across all three areas, as the robustness provided by a few indicators typically entails more resource intensive data collection. Within the proposed framework, the data requirements are as simplified as possible, leveraging existing practices where feasible, and suggesting new methods where needed. The result is a higher number of indicators to ensure robustness. The higher the number of indicators monitored, the more complete a picture one has of the performance of the mobility system. To minimise the burden on resource-constrained authorities, the OSIS and MSIS identify indicators that provide the highest value while simplifying data collection. Once the initial system is in place and adequate resources are dedicated to monitoring, the indicators can be made more robust. This may include more frequent collection of data, expansion of the types of data collected, and the calculation of more detailed indicators. Suggestions for this progression are included in the fact sheets under the “Further Considerations” section which concludes each sheet.

The surveys and consultations revealed that the most significant barrier to monitoring and evaluation is a lack of staff resources. While the monitoring framework endeavours to reduce this burden as much as possible, a minimum level of data collection, processing, calculation and regular updating of databases will be required. Concerns regarding staff resource needs are particularly high in the case of local authorities. Establishing baseline datasets is a necessary pre-requirement to implementing these monitoring systems; this is a resource-intensive first step for local authorities. Local authorities have also expressed the need for dedicated training on monitoring and evaluation to introduce the methodologies and fully understand their responsibilities. A more thorough discussion of current approaches and challenges with respect to data collection, as well as recommendations are included in subsequent sections.

For the most efficient use of resources, indicators should be coordinated across plans that require the monitoring of similar efforts in the transport domain. Local authorities expressed concern over the duplicate use of resources to develop plans, collect data, and report different indicators where there is overlap in the ultimate objective. Ideally, the indicators used for SUMPs should be applicable for other related plans as well. The SUMP law mentions certain plans (e.g. the strategic plans of OASA, OSETh and Elliniko Metro, Municipal Electric Vehicle Charging Plans, Urban Accessibility Plan, Sustainable Energy and Climate Action Plan, etc.) but does not always mention which plans take precedence. SUMPs could act as an umbrella for national strategies that relate to transport, however, given they can be under the purview of different ministries, providing clarity regarding the relationships and hierarchy between these plans would require coordination at the national level between ministries to streamline the expectations of local

authorities. Resource constraints also exist at the national level, and this is expected to be a challenge. The proposed framework endeavours to use data that would be available due to these other plans/strategies, to allow for the simplification of indicator requirements, and to align with the expected requirements of the TEN-T regulation. Additional coordination and buy in would be beneficial from the ministries involved in topics related to urban issues and sustainability.

Monitoring progress towards objectives: the Objective-Specific Indicator System

The Objective-Specific Indicator System allows the tracking of progress towards thirteen mobility objectives as outlined by the SUMP Law and by EU guidelines, including the TEN-T regulations aiming to support the MoIT assess how sustainable mobility is promoted across municipalities and regions. Understanding the performance of local authorities across the country can help the MoIT prioritise investments and the dedication of resources according to need. Municipalities and regions can use the indicators they calculate to understand their own local progress towards the objectives. In the case of some indicators, greater cooperation is expected between municipalities and regions.

This indicator system is intended to support local authorities that are required to have a SUMP (i.e. regions, and municipalities of primarily Type 1 and 2 with a few exceptions). These municipalities are likely to have technical capacities that are sufficient for data collection and processing, and indicator calculation on a biennial basis. Smaller municipalities that have opted to develop SUMPs can use the indicator system as a guide, but based on the conclusions of the stakeholder consultations, they may not be able to calculate all the indicators due to lack of capacity. If a complete national picture of SUMP performance is desired, including at the level of smaller municipalities, the national government will need to consider how these authorities may be supported in their reporting efforts. See subsequent sections for recommendations regarding challenges related to data collection, data processing, and indicator calculation.

Monitoring impact of measures: the Measure-Specific Indicator System

In the Measure-Specific Indicator System, each indicator allows for the evaluation of a specific transport measure to ensure that it is having the desired impact. Any local authority that is putting in place measures should also try to understand whether they are working. The indicators in this system apply to the local authorities implementing the measure (regardless of type) and will support their monitoring efforts. The frequency of indicator calculation may be higher than the biennial objective-specific indicators. It depends on the indicator and the authorities' capacity. Many of the objective-specific indicators are also reflected in this list, but it includes additional indicators to ensure at least one indicator is provided for each measure suggested in the SUMP Measure Selection Tool for Greece developed in the context of this same project. The MSIS provides a selection of indicators that authorities can prioritise based on the measures they implement.

Setting targets that reflect priorities and local conditions

While indicators allow comparison and benchmarking between local authorities at the national level, they are most useful when compared with a baseline value and a target value to measure progress towards a quantitative goal. As a first step, the baseline values for indicators should be calculated to document the starting point of the local authority. This could be completed as part of the SUMP elaboration process. The target can be defined as the final value the local authority wishes to reach; one that would demonstrate success. The goal is to lower or increase the indicator value in order to reach that target.

In most cases, local authorities should lead target-setting as part of the SUMP process. Often, the local context and priorities will determine the target values set by the authority. Take for example the indicator of bike network density (labelled as indicator i_1 in the monitoring framework). It is the bicycle network length divided by area of interest (e.g. city centre, built up area, etc.). Each local authority knows how much of its urban area can realistically be served by bike infrastructure depending on its geography. A city in relatively flat terrain would likely aim for a higher target value than one with mountainous terrain and other geographic barriers. The target value for an indicator can be calculated by assuming all desired projects are complete. In the case of bike network density, if a municipality with an area of 100km² wishes to create a 100km cycle network, their target would be an indicator of 1.0. Local authority-led target setting not only accounts for unique constraints, but also reflects the municipal priorities. A municipality that wishes to emphasise active modes due to their analysis of needs will necessarily set more ambitious targets for indicators in this policy area, and implement more related measures than one that identifies fleet electrification as a significant priority.

The national government may consider setting some targets for indicators it deems vital or aligns with EU targets. For example, in the case of road safety, the National Road Safety Strategic Plan 2021-2030 sets a target of a 50% reduction in road fatalities and a 50% reduction in serious injuries, in line with the Valetta Declaration (2017), for the decade 2021-2030 (Ministry of Infrastructure and Transport, 2022).

In a minority of cases, literature values can serve as appropriate targets where multiple studies have shown what the optimal value would be. The target on-street parking demand to supply ratio is an example. Numerous studies demonstrate that the ideal ratio is 0.85 to prevent excessive circulating while looking for parking which causes excess greenhouse gas emissions, air pollutants and other externalities, while maintaining an adequate supply. The goal is for local authorities to reach this optimum. A ratio that is higher than 0.85, as may be the case in many congested cities, can be lowered by reducing demand (through parking disincentives such as restrictions or pricing measures). An indicator of less than 0.85 demonstrates an oversupply of parking which could have the effect of encouraging car use. Removing excess parking and increasing the value to 0.85 would support a sustainable level of parking, while allowing the urban space to be converted to other uses. When designing policies to achieve targets, it is important that these measures align with sustainable transport policies. It may be possible, for example, to lower a ratio exceeding 0.85 by increasing parking availability, however this would hinder progress on the wider goals of reducing private car use.

While setting appropriate targets can internalise the priorities of a local authority, comparing targets and current indicator values helps the authority track progress. Identifying where certain areas are falling short can signal a need to prioritise investment in these areas. Similarly, at the national level, trends demonstrating that progress towards a certain objective is lagging may indicate a need to prioritise it through technical or financial support in the future.

The Objective-Specific Indicator System

The Objective-Specific Indicator system comprises 32 indicators, out of which five indicators are broken down into two to four sub-indicators. The OSIS lists 1-6 indicators for each of the nine objectives as defined by the SUMP law and the four objectives derived from EU guidelines. Some of these indicators are also used to monitor progress of individual measures and therefore included in the MSIS. Table 3 lists all indicators and whether they belong to the OSIS, the MSIS or both.

The indicators can pertain to multiple objectives but in the Excel tool are organised, first, according to the objective it is most directly suited to; the secondary objectives are listed in the fact sheets. Each fact sheet also specifies if indicators should be considered alongside others in order to have a holistic idea of progress towards an objective. The intent is to optimise and provide as few indicators as possible while providing adequate insight into the progress of mobility objectives. Each of the indicator factsheets included in the Excel tool provide details. The following sections simply discuss the main points that are tackled in these factsheets.

Table 3. Indicators included in the monitoring and evaluation framework proposed in the context of this project, including two indicator systems, the Objective-Specific System and the Measure-Specific System

ID	Indicator	Objective-specific	Measure-specific
i ₁	Bicycle network density	✓	✓
i ₂	Share of road network length corresponding to streets with adequate pavement width, traffic-calmed or pedestrianised streets	✓	✓
i _{3a}	Share of active and non-motorised modes in modal split	✓	
i _{3b}	Share of public transport in modal split	✓	
i _{3c}	Share of private cars in modal split	✓	
i _{3d}	Share of shared mobility services in modal split	✓	✓
i ₄	Share of mid-block crossings and intersection corners with installed curb ramps	✓	✓
i ₅	Share of road network length with installed guidance path tactile paving surface	✓	✓
i ₆	Share of signalised pedestrian crossings with audible signals	✓	✓
i _{7a}	Share of public transport stops with accessible information		✓
i _{7b}	Share of public transport stations with accessible information		✓
i ₈	Annual number of road fatalities per 100 000 inhabitants	✓	
i ₉	Annual number of serious injuries per 100 000 inhabitants	✓	
i ₁₀	Share of vulnerable road users in road fatalities	✓	✓
i ₁₁	Share of road network length with a speed limit of 30km/h or lower		✓
i ₁₂	Annual number of traffic violations per 100 000 inhabitants		✓
i ₁₃	Annual number of parking violations per 100 000 inhabitants		✓
i _{14a}	Population-weighted average network distance to the nearest local bus public transport stop	✓	✓
i _{14b}	Population-weighted average network distance to the nearest higher-order public transport stop or station	✓	✓
i ₁₅	Average frequency of local buses and higher-order public transport lines providing access to interurban stations	✓	✓
i _{16a}	Boardings per capita on local bus public transport services	✓	✓
i _{16b}	Boardings per capita on higher-order services	✓	✓
i _{16c}	Boardings per capita on interurban services	✓	✓
i ₁₇	On-time performance		✓
i ₁₈	Share of public transport stations serving as multimodal hubs		✓
i ₁₉	Car ownership per 1 000 inhabitants	✓	✓
i ₂₀	Share of road network length corresponding to streets covered by urban vehicle access regulation schemes		✓
i ₂₁	Travel time index		✓
i ₂₂	Number of public EV charging points installed per 100 000 inhabitants	✓	✓
i ₂₃	Share of local authority fleet annual mileage completed by clean vehicles	✓	✓

ID	Indicator	Objective-specific	Measure-specific
i24a	Share of clean vehicles in the urban public transport fleet	✓	✓
i24b	Share of clean vehicles in the inter-urban public transport fleet	✓	✓
i25	Share of clean vehicles in the taxi fleet	✓	
i26	Share of clean vehicles in urban logistics fleet	✓	✓
i27	Share of logistic spaces with charging infrastructure availability	✓	✓
i28	Average wait times and average in-vehicle travel times of on demand transport		✓
i29	Passenger trips per in-service hour of on demand transport		✓
i30	On-street parking demand to supply ratio	✓	✓
i31	Off-street parking demand to supply ratio	✓	✓
i32	Share of last-mile deliveries and pick-ups served in (un)loading bays	✓	✓
i33	(Un)loading bays infrastructure gap	✓	✓
i34	Share of truck drivers who have received eco-driving training	✓	✓
i35	Share of trucks equipped with in-vehicle tools to measure vehicle driving efficiencies		✓
i36	Share of freight receivers willing to receive deliveries and pickups during off-peak hours		✓
i37	Share of freight deliveries and pickups taking place during off-peak hours		✓
i38	Share of freight carriers that have signed a private agreement for asset sharing and collaboration		✓
i39a	Private car occupancy rate	✓	✓
i39b	Taxi occupancy rate	✓	✓
i40	Number of shared micromobility devices per 100 000 inhabitants	✓	✓
i41	Number of car-sharing vehicles per 100 000 inhabitants	✓	✓
i42	Population-weighted average network distance to nearest amenities for everyday needs	✓	
i43	Perceived quality of public spaces	✓	✓
i44	Annual number of participants in education programmes and awareness campaign-related events to promote sustainable urban mobility		✓
i45	Number of days per year on which the daily average concentration of PM ₁₀ exceeds 50 µg/m ³	✓	
i46	Annual greenhouse gas emissions per capita	✓	
i47	Share of deliveries and pickups using a transshipment hub or consolidation centre	✓	✓

Indicators to monitor Greek SUMP Law objectives

The indicators that evaluate progress towards the objective of **promoting active/non-motorised modes** measure the penetration of cycling and pedestrian-friendly infrastructure within a municipality and the modal share of active modes. Definitions of appropriate cycling and pedestrian infrastructure remain broad at this stage to capture all efforts, though in the future disaggregating indicators by type of infrastructure or limiting the definition only to the “best practice” versions may be considered. A cross cutting mode share indicator also contributes to measuring progress towards this objective by reporting on the share of active/non-motorised modes in the overall modal split.

The objective, **increase universal access and security**, is tracked by three infrastructure-related indicators measuring the share of mid-block crossings and intersections with curb ramps, the share of the road network with tactile paving, and the share of pedestrian crossings with audible signals. These indicators evaluate the most basic requirements to allow wheelchair users or people with low vision/blindness to navigate city pavements and cross intersections safely. Additional indicators are included as part of the MSIS with respect to accessible information, but these three indicators are proposed as part of the

obligatory reporting to maintain a reasonable reporting burden while capturing key elements of universal access.

Progress towards **road safety** is informed by three indicators measuring road fatalities, serious injuries and the share of vulnerable road users in the road fatalities. The first two are standard measurements of road safety and align with the National Road Safety Strategic Plan. The third is important to measure especially as authorities encourage and facilitate active mobility (and therefore increases the number of vulnerable road users), to ensure that policies are in place to reduce the dangers posed by car traffic.

Enhancing public transport, is a key objective in reducing car dependent mobility. Progress in this domain is measured by four indicators, some of which include sub indicators. The first, is a measure of spatial accessibility to local buses and higher-order public transport (where applicable). The second measures access to interurban bus stations based on the frequency of urban public transport connections serving the interurban station. Third, the indicator measures boardings per capita on local bus, higher order, and interurban services. While the first two are a measure of access, the third provides insight on the quality of the service. If there are relatively high boardings per capita, this indicates that the services are being used. Lastly, the mode split sub indicator related to public transport mode share demonstrates how public transport usage compares to other modes.

The objective to **reduce (private) four-wheeler traffic** is indirectly measured by many of the indicators that are also listed under other objectives. Two dedicated indicators are included specifically for this objective. Car ownership per capita is used to evaluate progress on reducing car dependency. The mode share of private cars also demonstrates how car use compares to other modes. Several other indicators were considered including mileage-based indicators to understand changes in transport activity as a result of sustainable transport policies. While this is significantly better than only car ownership, no reliable data collection process exists that would allow for mileage data to be associated with a specific local authority. Some local authorities will be able to track mileage through transport models and other sources, but for an objective specific indicator to allow comparisons across authorities, the same data must be available to all. The KTEOs that perform biennial vehicle inspections could theoretically record this data and submit the mileage values to a national repository but given there are no reliable links between the location of the garage/inspection centre and the area of primary use, this was not seen as a reliable source of geography-specific data. The national government could use this data at an aggregate level to track the intended reduction in private car use across the country but would not be able to relate it to individual efforts in municipalities and regions. Further data collection initiatives could be implemented, but the monitoring framework focuses first on data that can be accessed or could be accessed with a reasonably small effort on the part of local authorities or the national government.

Tracking the **promotion of electrification and alternative fuels** includes six indicators related to charging infrastructure (both public and specific to logistics) and fleet shares of clean vehicles for public transport, taxis and urban logistics fleets. The share of mileage completed by clean vehicles is an even better indicator, but due to difficulty in obtaining such data from third parties, a mileage share indicator is only proposed for local authority fleets.

The proposed indicators suggest a slightly more stringent definition of “clean vehicles” than Law 4710/2020 (FEK A/142/23-07-2020), which incorporated the revised EU “Clean Vehicles Directive” (2019/1161) into Greek legislation (Directive (EU) 2019/1161 of the European Parliament and of the Council of 20 June 2019 Amending Directive 2009/33/EC on the Promotion of Clean and Energy-Efficient Road Transport Vehicles, 2019). Ultimately, the national government will need to define “clean vehicles” for all fleet-related indicators, and local authorities should conform to these guidelines. For this project, the following definition is adopted:

- A clean light-duty vehicle is any zero-emission car or van.
- A clean heavy-duty vehicle is any truck or bus that runs on hydrogen, electricity (both BEVs and PHEVs), or 100% biofuels

While the revised EU “Clean Vehicles Directive” (2019/1161) (Directive (EU) 2019/1161 of the European Parliament and of the Council of 20 June 2019 Amending Directive 2009/33/EC on the Promotion of Clean and Energy-Efficient Road Transport Vehicles, 2019) states the following:

- A clean light-duty vehicle is any car or van that emits no more than 50 gCO₂/km and up to 80% of the applicable real driving emission (RDE) limits for nitrogen oxides (NO_x) and particulate number (PN) until 31 December 2025, and only zero-emission vehicles from 1 January 2026.
- A clean heavy-duty vehicle is any truck that runs on any of the following alternative fuels: hydrogen, electricity (both BEVs and PHEVs), natural gas (both CNG and LNG, including biomethane), liquid biofuels, synthetic and paraffinic fuels, and LPG.

As the definition of clean light-duty vehicles is set to change by the end of 2025, it is strongly recommended that local authorities only consider zero-emission vehicles as the only clean vehicles in the indicator calculation. This will ensure the consistency needed to accurately assess the evolution of the indicator over time. In addition, it is strongly suggested that local authorities avoid investing in or encouraging the investment in heavy-duty vehicles that use fossil fuels and only consider those that run on hydrogen, electricity, and 100% biofuels as clean.

For the objective **improve parking management**, two indicators allow authorities to understand the demand to supply ratio of on-street parking as well as off-street to monitor the parking situation holistically.

To **improve city logistics**, three indicators are proposed to evaluate progress. First, the share of deliveries being done using loading/unloading bays. Second, the gap between the available loading bay infrastructure and the theoretical need. These together provide insights on the availability and the use of loading bays. Compared to measures such as off-peak deliveries that are managed wholly at the local level, the national government may be more interested in the use of infrastructure for urban logistics which may be the focus of funding at the national level. Lastly, the share of truck drivers having received eco-driving training may be more relevant for the national government to track given they oversee licensing requirements which could be adjusted to include such training in the future.

Monitoring the objective to **exploit technology to promote multimodality and the efficient use of infrastructure** includes four indicators. The average car occupancy rates of private cars and taxis as well as ridehailing and ridesharing vehicles, helps understand whether policies to increase carpooling and ridesharing are contributing to higher occupancy which is a more efficient use of vehicles and related infrastructure. Additionally, the number of shared micromobility and car sharing vehicles available per capita demonstrate the availability of new modes for residents. Lastly, the mode split sub indicator which relates to shared mobility mode share demonstrates how the uptake of these modes compares to other modes.

Indicators to monitor additional EU mobility objectives

To monitor progress towards **increasing access to opportunities**, an accessibility indicator is proposed that calculates the population weighted network walking distance to amenities serving daily needs such as healthcare facilities, shops for necessities, public transport facilities, and schools. Accessibility to basic amenities should be a short walk or bike ride away, and this indicator focuses on walking/wheeling distance as it is the most available mode to most residents.

The **people-centred design of urban space** can be monitored using the perceived evaluations of the quality of public spaces. Transport planning can influence the dedication of public space to transport modes (e.g. cars, bikes, walking) as well as the reconversion of spaces formerly used for transport (e.g. parking) to other public uses. This indicator is particularly concerned with public spaces related to transport that improve the urban realm such as pedestrianised areas, squares and plazas, riverbanks, and waterfronts.

Monitoring the **reduction of greenhouse gases, air, and noise pollution** can be challenging at the local level. Two indicators are proposed with multiple possible methodologies. To ensure a standardised comparison, the methodology is advised to be set at the national level. The first, concerning air pollution, is an indicator of the number of days per year where the daily average PM10 concentrations are above 50 µg/m³. Second, is the level of greenhouse gases emitted annually per capita. This indicator requires more detailed calculations than the other indicators. Additional trainings may be desired and are discussed in the fact sheet.

Lastly, the objective to **support long distance freight flows** is monitored with an indicator looking at the share of deliveries or pick-ups being done while relying on transshipment hub or consolidation centre. To allow for the transition of goods between long distance and urban carriers, hubs are considered to be important interchange points supporting multimodality and the use of cleaner vehicles.

Roles and responsibilities of each level of government

Reporting on the Objective-Specific Indicators starts with the local authority. Municipalities are responsible for calculating nearly 70% of indicators and sub-indicators, while the regions are best placed to carry out the monitoring for 30% of the indicators and sub-indicators. For metropolitan areas (i.e. Type 1 municipalities), certain indicators should be calculated for the whole metropolitan area rather than at the individual municipality level. In this case, since there is no administrative body yet at the metropolitan level, the region is likely best suited to support and calculate the indicator using data from across the metropolitan area. There are six indicators where this is the case out of the indicators that are otherwise calculated by municipalities. Each municipality in the metropolitan area can then adopt the same value as the metropolitan area and use it in their reporting. There is one indicator that should be reported by both municipalities and regions separately. Further details specific to each indicator are provided in the fact sheets. Both levels of local authorities track the progress of their indicator from the baseline towards their target value to understand how their efforts are contributing to meeting mobility objectives.

Municipal indicators and underlying input values should be shared with the encompassing region and reported to the national government to allow comparisons and aggregations at higher administrative levels. Regional governments should similarly report indicators and input values to the national government where they are responsible. The accompanying Excel tool provides a sample reporting template and additional tools which in the future would be expected to be available as an online form.

National governments can track overall progress of municipalities. Regions can aggregate data from the municipalities within their boundaries. Both national and regional authorities will be able to compute

summary statistics to understand overall progress towards indicators and use the information to understand performance at the municipal level. The information can be used to better distribute resources and develop peer learning arrangements to allow municipalities to learn from each other and gain the support they need to achieve their objectives. Though municipalities and regions do not have a hierarchical relationship, collaborating through the sharing of indicators and input data will help regions support their municipalities as well.

National governments have the additional role of enabling data collection efforts that are currently hindered due to lack of resources, bureaucratic processes to access detailed data, and a lack of regulation with respect to formal data reporting agreements, as well as supporting household and freight survey efforts, as discussed previously. The region, as discussed, may play a role in enforcing or managing data reporting agreements. In the case of indicators that rely on survey data, the national government would be expected to establish a core set of questions which can then be administered locally by local authorities with additional questions as they see fit.

To ensure indicator comparisons compare “like with like” the national government must also establish certain definitions at the national level. In most cases, this means defining the spatial area of interest of some indicators (i.e. the city centre, built up area or entire municipality). In a few cases where there are multiple calculation methods possible, this means defining which of the methods should be adopted when reporting indicator values.

More details regarding the roles and responsibilities specific to each indicator are available in the factsheets.

The Measure-Specific Indicator System

The Measure-Specific Indicator System is comprised of 41 indicators made up of 1-3 indicator for each of the measures included in the SUMP Measure Selection Tool for Greece. Any time a measure is put in place, indicators should be used to track the progress towards a target from the starting point/baseline. About 85% of the indicators and sub indicators are also used in the Objective-Specific Indicator System. The intent is to optimise and provide as few indicators as possible while providing adequate insight into the progress of mobility measures. Each of the indicator factsheets included in the Excel tool provide details. The following sections simply discuss the main points that are tackled in these.

The MSIS is flexible and can be adapted to the needs and capacities of municipalities. Unlike the OSIS which is primarily concerned with comparisons between local authorities, MSIS is under the complete discretion of local authorities. While there are common indicators between OSIS and MSIS, the indicators may be calculated differently if a local authority wishes. When calculating indicators to monitor the impact of measures, municipalities should strive for the most robust version of the indicator they can calculate which may mean a larger area of interest than the objective-specific version or using a more detailed calculation method, or even disaggregating the indicator to provide more detailed information as is suggested for “further consideration” in the factsheets. In order to allow comparisons across authorities in the case of OSIS, the national government must standardise the areas of interest covered by the indicator (city centre, built up area, entire municipality, etc.) and, where appropriate, the method of calculation. Typically, this would be determined by the lowest capacity municipalities that they wish to include in the country-wide comparisons.

In the case of objective-specific indicators that are most relevant to be reported at the metropolitan level, municipalities report the indicators calculated at the metropolitan level by the region, as described in the

breakdown of responsibilities associated with the OSIS. However, if the same indicator can be used to monitor measures (i.e. it is part of the MSIS as well), the municipality can choose to calculate a more detailed indicator focusing on just their municipality as the area of interest if it is the spatial unit at which the measure in question is being implemented. It may be useful to compare to the metropolitan level value and identify opportunities for improvement. The ability of municipalities to do this will be resource-dependent but should be considered especially if it is related to a measure they identify as high priority. For example, while the number of shared micromobility devices is something that is tracked at the metropolitan level in the OSIS, individual Type 1 municipalities may wish to calculate this indicator at the municipal level when performing their own measure-specific monitoring to better understand the context within their municipality.

The frequency of indicator calculation may be higher than the biennial objective-specific indicators as well. Some indicators could be calculated annually or even more frequently depending on the indicator and the authorities' capacity. For example, changes to public transport services can be implemented more quickly and the impacts may be more immediate than large regulatory change or infrastructure schemes.

Each of the indicator factsheets included in the Excel tool provide details. The following section simply describes the main indicators suggested for each measure.

Indicators to monitor measures

Active mobility infrastructure measures such as **wide availability of high-quality active and micromobility infrastructure** and **pedestrianisation schemes and urban realm improvements** are suitably addressed with the objective-specific indicators previously discussed that pertain to promoting active modes, universal access, and people-centred design of urban space. Municipalities may choose to expand their areas of interest beyond what may be required to be reported as part of the OSIS.

Wide availability of accessible sustainable mobility information can be monitored by indicators concerning the share of public transport stops and stations that contain accessible information (i.e. information in many forms) and the share of traffic lights with audible signals. Together they support people with disabilities to independently use sustainable modes.

The impact of **traffic management using speed limitations** is measured partially by the road safety indicator from the OSIS looking at the share of vulnerable road users in road fatalities. This measures a change in the impact of speed limitations and is paired with the share of the road network that has a speed limit of 30km/h or lower to measure the extent to which the indicator has been applied.

Measures improving **enforcement of irregular street use** can be monitored based on the annual number of traffic and parking violations per 100 000 inhabitants. The indicator is not as straightforward to monitor, as it would be expected that there would be an initial increase (due to more consistent enforcement) but with continued enforcement, infractions are expected to decrease.

The impact of **high-quality public transport services and infrastructure measures** for local bus, higher order and interurban connections can be monitored using the objective-specific indicators for the objective of enhancing public transport. In addition, the more detailed indicator measuring on-time performance of local buses provides information on the reliability of the services.

High quality multimodal connections are measured by evaluating the share of public transport stations serving as multimodal hubs. Public transport is the central element of a multimodal system, therefore is an essential element of a multimodal hub.

Measures to **increase vehicle occupancy** can be evaluated with the objective-specific indicators looking at car occupancy of both private cars and taxis and ridehailing, as well as car ownership which also pertain to objectives of reducing car use and improving multimodality.

Municipalities implementing **congestion pricing and tolls** can measure the reduction in congestion on the corridor or area with the pricing measures using the travel time index. This index compares peak hour and free-flow travel speeds and should only be applied to areas affected by the measure, not entire municipalities.

Urban vehicle access regulation schemes can be monitored by looking at the share of the road network covered by regulations which demonstrates the extent of the coverage of such schemes.

Parking regulation indicators are also covered by the OSIS.

Electric vehicle charging infrastructure and green public procurement can be monitored with objective-specific indicators relating to charging point availability, the share of fleets or transport activity completed using clean vehicles.

The **availability of (electric) fleet sharing** options for both micromobility and car sharing are also covered by the objective specific indicators measuring the use of technology to promote multimodality and efficient use of infrastructure.

The quality and usage of **(electric) ridesharing and hailing schemes** can be monitored with indicators concerning the average wait and in-vehicle travel times as well the passenger trips per in-service hours of demand responsive transport. It also includes the objective-specific indicator on the share of clean vehicles in the taxi fleet.

Education programmes and awareness campaigns are difficult to compare as they can vary quite widely. The proposed indicator focuses on tracking the participants in events held as part of these programme and campaigns. Targets for this indicator may vary year to year as programmes change.

Fleet electrification of logistics includes two indicators pertaining to the share of clean vehicles in the logistics fleet and the availability of dedicated charging infrastructure.

Curb management for logistics can be monitored using the same objective specific indicators related to city logistics.

Progress on **eco-driving** practices can be monitored based on the share of drivers being trained (which is part of the OSIS) as well as the share of vehicles being equipped with tools to measure efficiencies and provide feedback.

The success of **changes in delivery schedules / off-peak deliveries** can be monitored by tracking the share of deliveries and pickups being done off-peak. Another indicator tracks the share of receivers willing to receive deliveries off-peak hours. Receivers play a crucial role in enabling whether off-peak deliveries are viable for carriers, thus having the data from both carriers and receivers helps understand how sustainable logistics promotion is faring in cities.

Collaborative logistics and asset sharing measures can be tracked using an indicator of the share of freight carriers that have signed a private agreement for asset sharing and collaboration.

Lastly, monitoring progress on measures related to **urban logistics hubs and pick-up/drop-off points**, the OSIS indicator pertaining to supporting long distance freight can be used. It calculates the share of deliveries and pickups being done using transshipment hubs or consolidation centres.

The Excel tool: Sustainable Urban Mobility Monitoring and Evaluation Tool for Greece

The accompanying Excel tool, Sustainable Urban Mobility Monitoring and Evaluation Tool for Greece, provides local authorities and the national government with an overview of the monitoring and evaluation framework and a description of the two indicator systems which comprise the framework. Local authorities can use the tool to help define indicators for their SUMP that either support monitoring of progress towards objectives and/or measures. They can learn about them through the fact sheets, then use the provided calculators to calculate the indicator, automatically generate a reporting summary (either at the municipal or regional level) and, lastly, use the progress tracker to understand how intermediate indicator values are performing relative to the baseline and target. The tool can be used as a standalone resource, but users would benefit from the background presented in this chapter.

In the long-term, the reporting of indicators is expected to be done online through the national SUMP portal. Until then, local authorities can use an Excel-based template to aid reporting, such as the one included in the tool. It is advised that a new copy be saved for each reporting year rather than overwriting a previous year.

Overview of the tool

The user is first presented with a “Home” sheet which provides an introduction and describes the sheets contained in the tool as well as a brief project description.

The “All Indicators” sheet lists all the indicators and their IDs that are part of the framework and whether they are relevant to the OSIS or the MSIS or both.

The “Objective-specific” sheet lists the subset of indicators that are part of the OSIS. In addition to name and ID, for each indicator, the sheet includes the primary monitored objective and monitored sustainability pillar (environment, society, or economy). Details such as the unit, scale, information on the goal or target, and responsible body are also included. The last column provides a link to the factsheet of the indicator.

The “Measure-specific” sheet lists the subset of indicators that are part of the MSIS. In addition to name and ID, for each indicator the sheet includes the measure that it measures. Again, details such as the unit, scale, information on the goal or target, and responsible authority are also included. The last column provides a link to the factsheet of the indicator.

The fact sheets are denoted by an indicator ID and the initials “FS”. The first section of each fact sheet repeats the information provided in the “Objective-specific” and “Measure-specific” sheets, as well as details on the area of interest and monitoring frequency when calculating the indicator for each indicator system. It also includes details on the required software. Next, a series of links provides quick access to the contents of the factsheet in case a user wishes jump to a specific section. The sections that follow include a description of the indicator including the rationale for including it, the input data required, the formula for calculation, and discussion on elements such as the area of interest that the indicator should cover and complementary indicators that may be best evaluated in conjunction. The following sections are on goals and targets and how to set them, the roles and responsibilities of different parties to contribute to data collection and calculating the indicator, how to collect the data, how to process the data and calculate the indicator and associated challenges, and lastly, further considerations for local authorities wishing to improve their monitoring and evaluation practices.

The next group of sheets are the indicator calculators, denoted by the indicator ID and the initials “CL”. Each of these sheets allows the local authority to choose their name, and reporting year, as well as specify

the area of interest. On the left, a section directs users to specify input values which align with the formula provided in the factsheet. On the right, the indicator value is automatically calculated. The sheets contain dummy values simply to demonstrate how to use the tool. They should not be used as default values and are not based on real-life conditions.

Two reporting summaries are provided in the sheets “Municipality RS” and “Region RS”. It is coded to automatically populate all the indicator values, input data, and further specifications made by the user in each calculator sheet. The only user input required is to select the local authority’s name and reporting year. The two summaries are limited to the indicators that municipalities and regions, respectively, provide. These can be provided to MoIT to fulfil the monitoring obligations under the SUMP law biennially as well as share data between the two levels of local authorities.

The last sheet is an optional internal resource for local authorities. For each indicator, they can specify a baseline value and a target value. By filling in the interim years, they can monitor their progress between the last two years and between the baseline and the current value.

Access the Sustainable Urban Mobility Monitoring and Evaluation Tool for Greece

Download the tool via the ITF website:

[Advancing Sustainable Mobility in Greece: Supporting SUMPs uptake | ITF \(itf-oecd.org\)](https://www.itf-oecd.org/advancing-sustainable-mobility-in-greece-supporting-sumps-uptake)

Annex I: Summary of national involvement required for the implementation of local mobility measures

This annexe highlights the actions necessary at the national level to enable sustainable transport measures locally. The table below describes the current actions that are (or can be) undertaken and future actions that may be needed for each measure included in the Sustainable Urban Mobility Measure Selection Tool for Greece. This document draws directly from the factsheets present in the tool. For more background, the reader is encouraged to refer to the relevant factsheet.

Code	Key policy measures	Level of involvement	Current actions required at the national level	Future actions that may be required at the national level
LPT	High-quality public transport services and infrastructure for local bus services	Medium to High	In most cases, the involvement of the national government in the implementation of public transport (PT) measures related to regulation, enhanced bus networks, and PT pricing is quite significant as it is the final supervisor of the contracts between local authorities and urban bus operators. Even in the case of Athens and Thessaloniki where a PT Authority exists, the final approval belongs to the government.	Under Law 4974/2022, the national government will procure urban PT services for the country. Regional authorities based on the proposals of the municipalities will propose an urban network plan, and the Ministry of Infrastructure and Transport will launch a tender to provide the services.
UPT	High-quality public transport infrastructure for higher-order networks	High	In most cases, as has been the case so far, the involvement of the national government in the implementation of PT measures related to higher-order networks is quite significant as it manages the contracts between municipalities and regions and PT operators. Even in the case of Athens and Thessaloniki, where a PT Authority exists, the final approval belongs to the government. PT priority measures can be implemented with no national involvement, as the sole responsibility lies with the respective Municipality or Region. On national roads, approval of the Decentralised Administration may be needed.	Especially in the case of BRT, as there is no precedent in Greece so far, the national government should push for adopting and implementing such services.

IPT	High-quality interurban public transport connections	High		<p>The involvement of the national government in the implementation of PT measures related to regulation, enhanced bus networks, and PT pricing is quite significant. Under Law 4974/2022, the national government will procure interurban PT services for the country. Regional authorities will propose an interurban network plan, and the Ministry of Infrastructure and Transport will launch a tender to provide the services.</p> <p>Establishing a DRT system may require a change in the current institutional and legislative framework for road passenger transport, requiring a high level of national involvement.</p>
SMI	Wide availability of accessible sustainable mobility information	Low		<p>Information provision measures are mainly implemented at municipal or regional and no national involvement is necessary. However, national involvement is needed in the drafting of relevant guidelines on the provision of information to people with disabilities and in the introduction of pre-conditions in public transport service contracts regarding PT information provision. Data sharing and reporting regulations may also be handled at the national level in conjunction with EU regulations and guidelines to aid multimodal trip planning systems.</p>
VOI	Vehicle occupancy incentives for passenger transport	Medium	<p>HOV lanes can be implemented both on regional and national level. When implemented by the respective region, the national government's approval is needed, while when implemented on the national level, the responsibility solely lies on the national government. National involvement is considered necessary also in terms of securing the necessary funding.</p>	<p>Preferential parking spaces can be introduced with no involvement from the national government. However, the national government can issue instructions and recommendations to simplify the implementation process at the local level. For instance, they can provide guidelines for establishing preferential parking for carpool vehicles. Such guidelines can eliminate the need for approval from the Decentralised Administration to implement this measure on a regional road.</p>
TMS	Traffic management: Speed limitations	Low to Medium	<p>When implemented by the municipality, the national government's involvement is not required although approval is required from the Decentralised Administration of the respective region to which the municipality belongs.</p>	<p>Implementing speed limits on a national level requires the appropriate revision of existing legislation and commitment by the national government to support it. Amending the existing national traffic law at the national level to enforce a uniform speed limit of 30km/h on all local roads would eliminate the need for additional procedures by the municipality.</p>
CPR	Congestion pricing, road charging and tolls	High		<p>However, although road pricing measures are implemented at the local level, the formulation of the legal basis for this measure must be undertaken by the highest level of government, i.e., the national government. The national government requires strong involvement and commitment to draft and approve the necessary legislative framework, which has yet to exist, apart from the case of road</p>

				tolls allowed to be implemented in major motorways.
PRR	Parking regulation	Medium	Parking regulation measures are implemented on the municipal level. When implemented by the corresponding municipality, the national government's involvement is not required, although approval is required from the Decentralised Administration of the respective region to which the municipality belongs. Parking standards (i.e. minimum and maximum parking spaces for new developments) are at the national level as part of building regulations, but they can be adapted to the local level by the individual urban planning departments to suite their circumstances.	
UVR	Urban vehicle access regulation schemes	Medium		The implementation of road pricing measures involves the highest level of government, which requires strong involvement and commitment from the national government. In order to introduce complementary charging measures, the national government must establish the legal basis for road pricing schemes. Currently, the only road pricing system in Greece is the road toll system.
ENR	Enforcement to avoid irregular street use	Low to Medium	Enforcement measures can be implemented both on the municipal and national level. When implemented by the Municipal Police, the national government's involvement is optional, although the initial approval for establishing such a unit has to be given at the national level. However, if such a measure is implemented on a national level by the Traffic Department, it requires strong involvement and commitment by the national government to mobilise the necessary resources.	
ACM	Wide availability of high-quality active and micromobility infrastructure	Medium	Since implementing this measure will, in most cases, involve a radical change in a road's geometric or functional characteristics, Municipalities will have to obtain the approval of the competent Decentralised Administration, which acts on behalf of the national government.	

PED	Pedestrianisation schemes and urban realm improvements	Low to Medium	Since implementing this measure will, in many cases, involve a radical change in a road's geometric or functional characteristics, Municipalities will have to obtain the approval of the competent Decentralised Administration.	
GPP	Green public procurement	Medium	The procurement of clean vehicles for the local authority fleets should be aligned with the relevant Law 4412/2016 on Public Procurement. In addition, it should also include a minimum of 5% BEVs and PHEVs to meet the provision of the National Climate Law. The level of national involvement differs between the various types of municipalities. In Type 1 municipalities, the national government drives the procurement of clean PT vehicles, while private bodies drive this process in all other Types. Although the level of national involvement in the latter case appears to be negligible, the national government is indirectly involved as it is the competent authority that will set the criteria (including bus technology and emissions footprint) and run the tendering procedures for awarding the public service contracts, as foreseen by the recent Law 4974/2022.	The national government should explore the introduction of funding mechanisms to subsidise the procurement of electric buses, as proposed in the National Electromobility Plan.
EVI	EV charging infrastructure	Low	Recognising local authorities' difficulty and limited capacity to develop and run concession agreements on electromobility, the national government has already published draft guidelines and a concession agreement template.	Municipalities will need guidance and training from the national government to help them make informed decisions about how to deploy EV charging infrastructure. Providing these resources may be relatively inexpensive compared to the overall cost of supporting electromobility. Still, it will be essential to ensure the long-term success of this initiative in Greece.

RSS	(Electric) ridesharing and hailing schemes	Medium	At local level there are ridesharing initiatives driven by the users themselves (e.g., for employees and university students), while at national level, efforts have remained at a test level.	<p>Currently, there are regulatory restrictions on the implementation of ridesharing schemes and on-demand public transport and therefore strong involvement from the national government is needed to draft and approve the necessary legislative framework. To simplify these processes and promote the implementation of on-demand transport trials, explicitly addressing DRT in legislation and guidance materials is essential. One crucial aspect is to maximise the number of potential service providers. To accomplish this, tender and operator licensing requirements should be adjusted to enable DRT transport providers to bid for public service contracts in rural areas.</p> <p>To increase the adoption of clean fleets for ridesharing and ridehailing services, the national government can consider targeted subsidies for the electrification of fleets for these services.</p> <p>The national government can also provide a centralised platform for knowledge-sharing and guidance on legal, funding and operational requirements between municipalities to address the lack of financial and human resources for small municipalities.</p>
FSS	(Electric) fleet sharing schemes	Low to Medium	Compared to carsharing schemes, micromobility sharing schemes are much more common in Greece. Such systems are in operation in several cities across the country. In some municipalities (e.g. Serres, Trikala, Thermaikos), they are offered free of charge by the municipality (funded through a partnership agreement with the national government) to encourage people to use bicycles for daily commuting and reduce the use of cars.	
EAC	Education programmes and awareness campaigns	High		<p>Guidance from the national level can be aimed at promoting municipal efforts and encouraging a comprehensive approach to education programmes to include all modes, particularly when promoting safety. Embedding education programmes in existing mandatory processes, such as through driving training should be considered, and would require national intervention.</p> <p>Changes to driver education and school curriculums will require the involvement of the national government, to make sure that the same standards are applied nationally.</p>

MMC	High-quality multimodal connections	Medium	EU regulations for the provision of multimodal travel information require the establishment of National Access Points (NAP) which include travel data from all modes, adhering to common standards. This has already been established.	The national government can play a role in funding the infrastructure, particularly for nationally relevant multimodal hubs, such as airports and ports, and cities identified as part of the TEN-T network. National involvement can address issues related to coordination of responsibilities between different actors, across different administrative boundaries, as well as ensure data sharing, interoperability of data, and the maintenance of the NAP.
ULH	Urban logistic hubs and pick-up/drop-off points	Medium		National authorities will have a secondary role in the development of hubs, their involvement could indeed support the development of specific logistic facilities, especially those in areas of high national interest, such as around the capital area. If the national government deems urban logistics hubs are advantageous in certain circumstances, they can provide support to the local authority through technical guidance and funding. They could further foster collaboration between public and private institutions for the development, maintenance and sustainable management of hubs. In addition, national authorities could indirectly support the setting up of hubs by requiring suppliers of national authority buildings to deliver consolidated goods by using a hub
CDS	Changes in delivery schedules / off-peak deliveries	Low to Medium	Changing delivery schedules requires a regulatory process that involves making decisions and obtaining approvals at multiple levels of government. Specifically, this measure can be initiated by introducing a new or revising an existing freight delivery regulation. Before this regulation can come into force, it must be adopted by the municipal and regional councils and approved by the competent decentralised administration, which acts on behalf of the national government	
ECD	Eco-driving	Medium to High	The national government can give financial support, through subsidies or loans, for urban carriers to train their drivers.	The national government can set up specific taxes for carriers to fund financial support for training programmes. They can also require eco-driving trainings as part of mandatory elements for drivers' licenses.
CML	Curb management for logistics	Low to Medium	The creation of (un)loading bays and the imposition of parking restrictions for better managing curbspace need to be approved by the competent decentralised administration prior to application. In addition to this, in cities without municipal police, the traffic police may need to be involved in enforcing curbspace access restrictions.	

FLE	Fleet electrification	High	National authorities can support fleet electrification through targeted subsidies or financial support for freight carriers. In addition to this, national authorities, via the decentralised administration acting on their behalf, are responsible for approving electric fleet regulatory incentives, such as preferential parking or access to road lanes.	National authorities have a key role to play in homologating emerging freight electric vehicles, as well as for setting tax exemptions for EVs.
CLA	Collaborative logistics and asset sharing	Low to Medium		The national government could play a supporting rather than a controlling role in implementing this measure. National authorities can foster knowledge exchange between authorities with different levels of experience with the promotion of collaborative logistics. This can help in standardising Greek good practices on the subject. National authorities could also consider setting up general guidelines for promoting collaboration and asset sharing at the local level, which could particularly help smaller municipalities in fostering the practice in their specific areas.

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Advancing Sustainable Mobility in Greece

Supporting SUMP's uptake

This project supports Greece in developing a sustainable transport sector and cleaner mobility. Specifically, it aims to accelerate the uptake of electric vehicles and the adoption of Sustainable Urban Mobility Plans (SUMPs).

By 2030, at least 100 European cities should be climate neutral. This project will help Greece to accomplish this objective, as set out in the European Commission's Sustainable and Smart Mobility Strategy. It supports the Greek government in advancing the uptake of SUMPs: the national government wishes to support local authorities in defining sustainable urban mobility measures that reflect their geographical and socio-economic characteristics. The ITF implemented a benchmarking exercise and stakeholder consultations to create two decision-making tools that will help local authorities to select the SUMP measures best suited for them, and help them evaluate the effects of their SUMPs. Background research and recommendations are presented in the reports, while the tools are available in an Excel format. The official project title is "Recharge and Refuel: Clean, Smart and Fair Urban Mobility".

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