FACT-FINDING STUDY ON STATUS AND FUTURE NEEDS REGARDING LOW- AND ZERO-EMISSION URBAN MOBILITY

Final Report

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EUROPEAN COMMISSION
Directorate-General for Mobility and Transport
Directorate B — Investment, Innovative & Sustainable Transport
Unit B.3 — Innovation & Research
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Fact-finding study on status and future needs regarding low- and zero-emission urban mobility
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Final Report
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADEME</td>
<td>Agence de la transition écologique</td>
</tr>
<tr>
<td>BMLFUW</td>
<td>Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft</td>
</tr>
<tr>
<td>BRT</td>
<td>Bus rapid transit</td>
</tr>
<tr>
<td>CEF</td>
<td>Connecting Europe Facility</td>
</tr>
<tr>
<td>CEREMA</td>
<td>Centre d’études et d’expertise sur les risques, l’environnement, la mobilité et l’aménagement</td>
</tr>
<tr>
<td>CLARS</td>
<td>Charging, Low Emission Zones, other Access Regulation Schemes</td>
</tr>
<tr>
<td>CO₂</td>
<td>Carbon Dioxide</td>
</tr>
<tr>
<td>DG MOVE</td>
<td>Directorate-General for Mobility and Transport</td>
</tr>
<tr>
<td>EAFO</td>
<td>European Alternative Fuels Observatory</td>
</tr>
<tr>
<td>EAFRD</td>
<td>European Agricultural Fund for Rural Development</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>EGUM</td>
<td>Expert Group on Urban Mobility</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>FCL</td>
<td>Freight Leaders Council</td>
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<tr>
<td>FFS</td>
<td>Fact-finding Study</td>
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<tr>
<td>GHG</td>
<td>Greenhouse Gas</td>
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<tr>
<td>GIS</td>
<td>Geographic Information Systems</td>
</tr>
<tr>
<td>GMNI</td>
<td>Gemeentelijk Netwerk voor Mobiliteit en Infrastructuur</td>
</tr>
<tr>
<td>HGV</td>
<td>Heavy Goods Vehicle</td>
</tr>
<tr>
<td>ITS</td>
<td>Intelligent Transport Services</td>
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<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
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<td>LEZ</td>
<td>Low Emission Zone</td>
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<tr>
<td>LGV</td>
<td>Light Good Vehicle</td>
</tr>
<tr>
<td>LILI</td>
<td>Linnadja Liikuvus (“Cities and Mobility” in Estonian)</td>
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<tr>
<td>MaaS</td>
<td>Mobility as a Service</td>
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<tr>
<td>MAGDA</td>
<td>Maximum Data Sharing between Agencies</td>
</tr>
<tr>
<td>MS</td>
<td>Member State</td>
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<tr>
<td>NGO</td>
<td>Non-governmental Organisation</td>
</tr>
<tr>
<td>NO₂</td>
<td>Nitrogen Dioxide</td>
</tr>
<tr>
<td>NSSPs</td>
<td>National SUMP Supporting Programmes</td>
</tr>
<tr>
<td>PDU</td>
<td>Plan de Déplacements Urbains</td>
</tr>
<tr>
<td>PM</td>
<td>Particulate Matter</td>
</tr>
<tr>
<td>PMT</td>
<td>Plan de Mobilidade e Trasportes</td>
</tr>
<tr>
<td>PT</td>
<td>Public Transport</td>
</tr>
<tr>
<td>SULP</td>
<td>Sustainable Urban Logistics Plan</td>
</tr>
<tr>
<td>SUMI</td>
<td>Sustainable Urban Mobility Indicator</td>
</tr>
<tr>
<td>SUMP</td>
<td>Sustainable Urban Mobility Plan</td>
</tr>
<tr>
<td>SUMPSP</td>
<td>Sustainable Mobility and Public Space Plan</td>
</tr>
<tr>
<td>TEN-T</td>
<td>Trans-European Transport Network</td>
</tr>
<tr>
<td>TOD</td>
<td>Transit-Oriented Development</td>
</tr>
<tr>
<td>ToR</td>
<td>Terms of Reference</td>
</tr>
<tr>
<td>TTS</td>
<td>Telematica Trasporti e Sicurezza</td>
</tr>
<tr>
<td>ULEZ</td>
<td>Ultra-Low Emission Zone</td>
</tr>
</tbody>
</table>
The key terms used in this report are defined here:

**Active parking management** is the dynamic management of parking facilities in a region to optimise performance and utilisation of those facilities while influencing travel behaviour at various stages along the trip making process: i.e., from origin to destination.

**Clean buses** are buses using one of the following alternative fuels: hydrogen (fuel cells), battery electric (including plug-in hybrids), natural gas (both CNG and LNG, including biomethane), liquid biofuels, synthetic and paraffinic fuels, liquified petroleum gas (LPG).

**Free-floating stand-up e-scooter sharing schemes** are schemes that offers the opportunity to park e-scooters anywhere within the city’s designated area.

**Mobility as a Service** is the integration of various forms of transport services into a single mobility service accessible on demand. To meet a customer’s request, a MaaS operator facilitates a diverse menu of transport options, be they public transport, ride-, car- or bike-sharing, taxi or car rental/lease, or a combination thereof. The MaaS integrator gathers and integrates data from mobility service providers. For the user, MaaS offers added value through the use of a single application to provide access to mobility, with a single payment channel instead of multiple ticketing and payment operations.

**Mobility-related data and indicators** are data collection routines of local authorities, data collected on specific mobility issues and the calculation of selected SUMI indicators and simplified proxy indicators respectively.

**Proxy indicators** are a simplified version of the sustainable urban mobility indicators (description provided below). The definitions of the proxy indicators included in this study are as follows:

- The proxy indicator “**Access to public transport**” consists in the percentage of the population with appropriate access to public transport.
- The proxy indicator “**Affordability of public transport**” is defined as the price per single trip ticket, which allows one journey for an adult without special benefits to travel from the city boundary to the city centre, weighted by national Purchasing Power Parity.
- The proxy indicator “**Air pollutant emissions**” is defined as the average annual NO₂ and PM emissions from road transport within the city.
- The proxy indicator “**Congestion**” captures the congestion level in a city based on established congestion indices (TomTom, INRIX and/or Traffic Index) or city-own calculation method.
- The proxy indicator “**Greenhouse gas emissions**” is defined as the transport-related greenhouse gas emissions in metric tons of CO₂ (equivalents) per capita and per year.
- The proxy indicator “**Modal split**” is defined as the percentage share of each mode of transport for passenger mobility.

**Station-based stand-up e-scooter sharing schemes** consist in schemes that do not necessarily have a station but for which e-scooters may only be parked in designated areas of the city.
**Sustainable Urban Mobility Indicators** are a tool for cities and urban areas to identify the strengths and weaknesses of their mobility system and to focus on areas for improvement. The definitions of the SUMI indicators included in this study are as follows:

- The SUMI indicator “**Access to mobility services**” is defined as the share of population with appropriate access to mobility services (public transport).
- The SUMI indicator “**Affordability of public transport for the poorest group**” is defined as the share of the poorest quartile of the population’s household budget required to hold public transport (PT) passes (unlimited monthly travel or equivalent) in the urban area of residence.
- The SUMI indicator “**Air pollutant emissions**” is defined as air pollutant emissions of all passenger and freight transport modes (exhaust and non-exhaust for PM$_{2.5}$) in the urban area.
- The SUMI indicator “**Congestion and delays**” captures delays in road traffic and in public transport during peak hours compared to off peak travel (private road traffic) and optimal public transport travel time (public transport).
- The SUMI indicator “**Emissions of greenhouse gases**” is defined as well-to-wheels greenhouse gas emissions by all urban area passenger and freight transport modes.
- The SUMI indicator “**Modal split**” requests cities to provide modal split data according to different methodologies. For passenger mobility: Vehicle kilometres driven; Passenger kilometres driven; Number of trips; Vehicle kilometres per trip driven. For freight: Goods vehicles kilometres driven; Freight tonnes kilometres driven. For shared mobility: Vehicle kilometres driven; Number of trips.
- The SUMI indicator “**Road deaths**” is defined as road deaths by all transport accidents in the urban area on a yearly basis.
- The SUMI indicator “**Traffic active safety modes**” is defined as the fatalities of active modes users in traffic accidents in the city in relation to their exposure to traffic.

**Sustainable Urban Mobility Planning** is a continual integrated planning process at the local or regional level to increase urban accessibility and quality of life, which is often summarised in a policy document, a SUMP.

**Sustainable Urban Logistics Planning** is a strategic and integrated policy-making process, often resulting in an action plan, a chapter in a SUMP or in a separate SULP policy plan, supporting local public decision makers and stakeholders in developing, implementing and monitoring city logistics policy measures.

**Urban Vehicle Access Regulation (UVAR)** is a set of measures to regulate vehicular access to urban infrastructure, specific urban areas and/or road networks. Limitations to vehicle circulation involving individual roads, e.g. parking measures, are not included in the study.

**Zero emission buses** are buses, which emit no tailpipe emissions, that are, purely battery electric buses (excluding hybrid buses) or hydrogen-powered buses.
1. INTRODUCTION

This document is the revised draft final report of the fact-finding study on the status and future needs regarding low- and zero-emission urban mobility. This is the third and penultimate deliverable submitted by PwC, Ecorys, Isinnova and Rupprecht Consult to the Directorate General for Mobility and Transport (DG MOVE) of the European Commission.

The aim of this report is to provide an analysis of the findings, along with factually based conclusions and recommendations and it complements the evaluation of Urban Mobility Package 2013 published in March '21 by the European Commission. Based on these studies, the Commission services shall assess the need for further action on integrated urban mobility.

1.1. Objective and scope of the report

The general objective of the study is to provide the Commission with the status of current urban mobility situation and indicate gaps in those areas and related needs of cities when it comes to achieving safe, accessible (incl. affordable), smart and low- and zero-emission urban mobility. More specifically, the study will:

- Analyse urban mobility situation in a big sample of EU cities of different sizes and types, from all Member States, especially when it comes to Sustainable Urban Mobility Planning, Urban Vehicle Access Regulations (UVARs), urban logistics and data collection and indicators;
- Understand the level of support of Member States on urban mobility topics;
- Identify the main challenges, gaps and needs when it comes to the analysed urban mobility situation at city level and the level of support of Member States;
- Provide an indication how the analysed situation compares with the EU-level objectives, in particular referred to in the White Paper 2011, the Green Deal and the Smart and Sustainable Mobility Strategy, regarding achieving low- and zero-emission, accessible (incl. affordable), smart and safe urban mobility.
- Draw meaningful conclusions that can be deemed representative for the whole EU.

1.2. Organisation of the report

The report is divided into the following chapters:

1. **Introduction** – a presentation of the objectives and scope of the report, overall methodology adopted in this study, changes and adaptations to the initial methodology and consideration on the limitations of the methodology;

2. **Methodology** - a description of the overall design and methods used, the changes and adaptations to the initial methodology, and the considerations on the limitations of the methodology;

3. **State of play on urban mobility** - including:
   3.1. **Overview at national level across key thematic areas** – an overview on the level of support the different Member States are offering on the study domains: SUMP, UVAR and SULP;
   3.2. **Overview at local level for key thematic areas** – an overview of the situation at city level concerning the study domains: SUMP, UVAR and SULP;

4. **Challenges, gaps and needs in view of EU policy objective** - overview of challenges, gaps and needs of cities in relation to the four domain areas and the national level;
5. **Conclusions and recommendations** – based on the study’s findings.

The report also contains the following annexes that have been attached:

- **Annex A**: Indicator sheets – Domain A (Sustainable Urban Mobility Planning);
- **Annex B**: Indicator sheets – Domain B (UVAR);
- **Annex C**: Indicator sheets - Domain C (Sustainable Urban Logistics Planning);
- **Annex D**: Indicator sheets – Domain D (Mobility-related data collection and indicators at local level);
- **Annex E**: MS sheets;
- **Annex F**: Indicator sheets - Correlations (Mobility-related data collection and indicators at local level);
- **Annex G**: Survey templates.
- **Annex H**: List of contacted cities
- **Annex I**: Number of urban mobility plans or SUMP in place per Member State.
2. METHODOLOGY

This chapter presents an overview of the methodology developed for this study. As such, it presents the different phases and accompanying tools, as well as a brief overview of the mitigations and limitations of the study.

2.1. Overall design and methods used

As provided for in the assignment, the following tasks have been performed:

- **Task 1** - Detailed description of the current situation regarding urban mobility at local level;
- **Task 2** - Analysis of the situation at Member States level; and
- **Task 3** - Identification of gaps and needs in view of EU objectives.

The figure below depicts the study’s methodological approach.

**Figure 3. Project in a Box**

2.1.1. City onboarding

As shown in the figure above, the study includes 2 dimensions of analysis. The first, an analysis of current situation at Member States level with regards to urban mobility (i.e. Task 2) and the second, an analysis of the current urban mobility situation at city level (i.e. Task 1).

In order to carry out the analysis at city level, a **sample of 125 cities** has been targeted. In order to reach a target of 125 cities, an extensive number of cities was approached, as described in Box 1.

**Box 1. Study’s sample of cities**

A sample of 125 cities has been targeted for this study, in order to analyse the mobility situation at local level.

The official list of cities selected to be part of the sample - which was agreed with the EC and provided in the Inception Report - has since considerably changed due to the unavailability of several of these cities to take part in the study.

In order to reach the original target of 125 cities, the Consortium contacted several cities in addition to the ones included in the initial list. In total, 233 cities have been contacted since the beginning of the study, in order to reach the original target and ensure that each country is adequately represented in the study (please refer to Annex H for a complete list of the
cities that were contacted). It is important to mention that the 233 cities have been carefully selected in order to ensure that the study includes a balanced mix of cities with different characteristics.

Figure 4 showcases the size of the 125 sampled cities and their presence on the TEN-T Network.

**Figure 4. Size and presence on the TEN-T Network of the sample of 125 cities**

![Figure 4](image)

Figure 5 provides a breakdown of the 125 cities included in the study for each Member State.

**Figure 5. Breakdown of city sample per Member State**

![Figure 5](image)

It is important to specify that the level of involvement of cities has varied and some cities have been covered partially or completely by desk research (for further information on this please refer to Annex H).

### 2.1.2. Study domains

The study involved the following 4 domain areas of analysis:

---

1 Cities have been categorized as either urban nodes, core, comprehensive or non-TEN-T by evaluating their position on the TEN-T transport network by consulting the TEN-T Maps. The full list of categorizations of cities can be viewed in Annex A.
Table 5. The domains

<table>
<thead>
<tr>
<th>Domain</th>
<th>Definition*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - Sustainable Urban Mobility Planning</td>
<td>Sustainable Urban Mobility Planning is a continual integrated planning process at the local or regional level to increase urban accessibility and quality of life, which is often summarised in a policy document (a “SUMP”).</td>
</tr>
<tr>
<td>B - Urban Vehicle Access Regulation (UVAR)</td>
<td>UVAR is a set of measures to regulate vehicular access to urban infrastructure, specific urban areas and/or road networks. Limitations to vehicle circulation involving individual roads, e.g. parking measures, are not included in the study.</td>
</tr>
<tr>
<td>C - Sustainable Urban Logistics Planning</td>
<td>A Sustainable Urban Logistics Planning is a strategic and integrated policy-making process, often resulting in an action plan, a chapter in a SUMP or in a separate SULP policy plan, supporting local public decision makers and stakeholders in developing, implementing and monitoring city logistics policy measures.</td>
</tr>
<tr>
<td>D - Mobility-related data collection and indicators at local level</td>
<td>Mobility-related data and indicators are data collection routines of local authorities, data collected on specific mobility issues and the calculation of selected SUMI indicators and simplified proxy indicators respectively.</td>
</tr>
</tbody>
</table>

* According to the consortium

2.1.3. Data collection

The data collection activity was carried out through a coordinated multi-level research whereby data was gathered in three different phases (i.e. domain experts, country managers, city representatives) by leveraging on different Consortium partners expertise, geographical outreach and language proficiency of our team and local connections with cities data providers.

Domain experts were responsible for the first phase of data collection: they collected domain-specific data on each one of 125 cities that have been selected for the study, mostly by consulting English sources, but when appropriate also by consulting local language sources with the support of online translation tools.

In the second phase of the data collection, Country Managers collected information to fill in the existing data gaps from the previous phase leveraging mostly on national sources. After the first two phases of data collection were completed, the Country Managers contacted directly the cities’ representatives and invited them to integrate and validate the information already collected, providing the missing information/data.

The following table lists the data collection tools employed for the study:

Table 6. Data collection tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Domain</th>
<th>Actors involved</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUMP self-assessment tool*</td>
<td>Domain A</td>
<td>City Representatives</td>
<td>Online tool used to enable planning authorities to evaluate the SUMP of their city or functional urban area. If no plan exists, it can also be used to assess and</td>
</tr>
<tr>
<td>Tool</td>
<td>Domain</td>
<td>Actors involved</td>
<td>Description</td>
</tr>
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<td>------------------------------</td>
<td>-----------------------------</td>
<td>----------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Transport plan database</td>
<td>Domain A</td>
<td>Domain Experts, Country Managers</td>
<td>Database that collects all available transport plans for the sampled cities and cluster information according to key topics. Provided in Annex G.</td>
</tr>
<tr>
<td>Cross-domain questionnaire</td>
<td>Domain A, Domain C and Domain D</td>
<td>Domain Experts, Country Managers, City Representatives</td>
<td>Online survey covering the following four topics: Sustainable Urban Mobility Planning; Impact of COVID-19 on urban mobility; Sustainable Urban Logistics Planning; Other local-level mobility-related data (SUMI indicators, public transport, etc.) Provided in Annex G.</td>
</tr>
<tr>
<td>UVAR spreadsheet</td>
<td>Domain B</td>
<td>Domain Experts, Country Managers, City Representatives</td>
<td>Database that collects information on UVAR schemes of sampled cities including the type of UVAR, area covered, time slots, enforcement methods, etc. In this case, most data were collected by domain experts and country managers; therefore, cities were only asked to validate the data gathered.</td>
</tr>
<tr>
<td>FFS / SUMI spreadsheets</td>
<td>Domain D</td>
<td>City Representatives</td>
<td>Spreadsheets that allow the calculation of 8 sustainable urban mobility indicators (SUMI) and 6 proxy indicators.</td>
</tr>
<tr>
<td>National framework survey</td>
<td>Domain A, Domain B and Domain C</td>
<td>Domain Experts, Country Managers</td>
<td>Survey assessing the relationship between national frameworks affecting urban mobility and the three domains SUMP, UVAR and SULP. Provided in Annex G.</td>
</tr>
<tr>
<td>UVAR mini survey</td>
<td>Domain B</td>
<td>City Representatives</td>
<td>Online survey covering a number of topics related to UVAR including; data standardisation and format, compliance with ITS directive and integration with SULP data. Provided in Annex G.</td>
</tr>
</tbody>
</table>

* Tool developed before the study. The other tool has been custom developed for the purposes of this study.

2.1.4. Interim output

The intermediate output of the study consisted firstly, in a **status update on the situation at EU level for each of the four domains**; this has also included the development of several indicator sheets. These sheets, which are provided in Annex A, B, C, and D, present the indicators for each domain at three levels of analysis: aggregated data for all cities analysed, data grouped by categories (e.g. city size and presence on TEN-T network) and data on each city.
The second intermediate output was the **assessment of the level of support from Member States on urban mobility**. As part of this output, 28 Member State sheets were developed (one for each Member State and with the addition of the United Kingdom). These sheets present the link between national frameworks and domains A, B and C.

### 2.1.5. Final output

The analysis carried out and the intermediate outputs have allowed to reach the final outcomes of the study, namely: **the identification of the challenges, gaps and needs in relation to the four domains**, an indication on how the analysed situation compares with the EU-level objectives, as well as **recommendations**. An additional output, that was not initially planned, has been the **investigation of possible correlations between urban mobility indicators and national and city policies**. This analysis (provided in Annex F) has been developed to respond to questions that emerged from the interim report which has highlighted the need to assess the relations that may exist between different indicators and the effects of a policy with respect to local urban mobility.

### 2.2. Changes and adaptations to the initial methodology

Throughout the course of this study, several adaptations and mitigation strategies were put in place that deviated from the original methodology.

#### 2.2.1. Extended data collection

The study, which started in June 2020, has been conducted in the midst of the **Covid-19 pandemic**. This has resulted in several additional challenges, especially for the data collection phase. The pandemic in fact, has caused resources from cities to be drastically reduced, as they have been involved in responding to virus outbreak and preparing the up-coming recovery plan. Cities have also experienced several issues and a reduction in operations due to lockdowns and working from home (as, at times, they were not properly equipped for doing so).

This resulted in a lower response rate in questionnaires as many cities, due to the issues caused by the pandemic, required additional time in order to fill in the different data collection tools or lamented lack of time and resources. For this reason, the data collection phase continued well beyond the original deadline, the end of December 2020. The data collection in fact, was extended until the middle of March 2021.

#### 2.2.2. Cities covered via desk research

Some cities that had accepted to participate in the study, due to issues caused by the current pandemic (please refer to previous section for further details) were not able to complete all three steps of the data collection tools (i.e. SUMP self-assessment, FFS/SUMI spreadsheets and the cross-domain survey). In this case, country managers filled in the remaining tools to the best of their capacity, by researching information via desk analysis. In this case data was not validated.

In addition, the 125 cities covered by the study, include **13 capital cities** (refer to Annex H for the full list of cities) that, although refused or did not respond (specifically, 2 refused and 11 did not reply) were still included in the study, as per agreement with the European Commission to cover the capitals cities of all Member States. Data on these capitals was collected through desk research.

Furthermore, the 125 cities taking part in the study, include **13 cities that have been covered** by domain experts and country managers via desk research to the best of
their capacity. As previously explained, a lot of effort was put into engaging with city representatives and an extensive number of cities was contacted. Despite this, it was not possible to on-board 125 cities.

Lastly, the Consortium identified a number of cities that, after having initially confirmed their willingness to participate in the study, stopped collaborating due to several reasons. The data collection for these 14 non-collaborative cities which only partially filled in the data collection tools, were completed by the country manager for the final report.

Therefore, in order to reach the 125-city target and to cover all EU capital cities as agreed with the Commission, a total of 26 out of 125 cities were covered by desk research. In addition to this, 14 cities partially completed the data collection, which was then concluded by country managers. The list of cities covered fully or partially by desk research is as follows:

Table 7. Cities fully or partially covered by desk research

<table>
<thead>
<tr>
<th>Capitals</th>
<th>Additional cities</th>
</tr>
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<tbody>
<tr>
<td>Amsterdam (NL)</td>
<td>Aarhus (DK)</td>
</tr>
<tr>
<td></td>
<td>Milan (IT)</td>
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<tr>
<td>Athens (EL)</td>
<td>Braga (PT)</td>
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<td>Odense (DK)</td>
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<td>Copenhagen (DK)</td>
<td>Brasov (RO)</td>
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<td>Oradea (RO)</td>
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<td>Wroclaw (PL)</td>
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<td>Maia (PT)</td>
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2.2.3. Additional data collection tools

An additional data collection tool was developed for Domain B (UVAR), the **UVAR mini survey**. This questionnaire was developed during the study, following the request of the European Commission to cover a number of additional topics regarding UVAR schemes - not part of the original scope of the study. The survey, which was filled in by cities between January and March 2021, gathered information on the type of data that cities collect, the format of this data and the willingness of cities to comply with the ITS directive and the integration of UVAR with SULP data. In Annex G it is possible to view the final version of the survey.

2.2.4. Correlations

During the course of the study, it was suggested to investigate the **positive and/or negative correlations** that may exist **between the presence at city level of a given policy with respect to local urban mobility and different sustainability indicators connected with urban mobility**. Such analysis, carried out leveraging on the data available, is reported in Annex F.

It is important to specify that the analysis presents some strong limitations on data availability and validation, especially for the national framework section. Moreover, it should be noted that the proposed correlations provide a picture of the situation to date and do not investigate if the observed indicators have improved over time as an effect of the policy.

Hence, the results should be interpreted with caution. The topic should be further investigated in the future ideally relying on the same indicators collected over time and for even larger numbers of cities or for specific cities in which a sufficient amount of data is available. For this reason, the outcome of the correlation analysis is reported in Annex F but not further discussed in the main body of the present report.

2.2.5. Indicator sheets

The Inception Report provided for a number of indicators to be calculated based on collected data. During the study though, in order to best represent the large amount of data collected, the need to develop additional indicators emerged.

In addition, a more-in-depth analysis of the proposed indicators was developed. The **indicator sheets** in fact, include, for each indicator, three levels of analysis: aggregated data for all cities analysed, data grouped by categories (city size and presence on TEN-T network) and data on each city.

2.2.6. Revision of the SUMI indicators for the fact-finding study

Initially, it had been planned to request cities to calculate eight SUMI indicators. At the time of the submission of the Inception Report, the final results of the SUMI project were published, and these showed the extreme difficulty for cities in sourcing the required data for the calculation of six of these indicators. Thus, the Consortium agreed with the European Commission to maintain only the **two SUMI indicators** ("Road deaths" and "Traffic safety active modes") that cities would be able to fill in and to develop **proxy indicators** for the ones too difficult to calculate. The objective of the alternative spreadsheets that had been prepared for the study was to collect the respective data, and to understand whether the requested data can generally be provided.
2.2.7. Validation of data by Expert Group on Urban Mobility (EGUM)

Task 2 included filling in the National Framework survey by domain experts with the support of country managers. As the information in the survey has been mostly collected by desk research, it emerged the need to validate this data. The European Commission and the Consortium agreed therefore, to ask EGUM’s members for support in validating the collected data on national frameworks (please refer to section 3.3.1 for further details on this). Overall, 9 Member States reviewed the data.

2.2.8. Sensitive data of SUMI indicators

During the data collection, cities have expressed their concern on sharing the information collected to develop some SUMI indicators as they consider it sensitive. Therefore, they have requested not to report this type of data at city level, but only in aggregated form. This is particularly the case for ‘Collection of mobility-related data Air pollutant emissions in each sample’ under Domain D.

2.3. Considerations on the limitations of the methodology

While carrying out the study, a number of limitations to the methodology were identified.

Firstly, as already mentioned in section 2.1.3, the study, in order to be carried out successfully, was based on the use of several data collection tools to be filled in with the close cooperation of cities. These tools could either be already familiar to cities (e.g. SUMP self-assessment tool) or newly developed for this study. Some of these tools were aimed at gathering data which might have required intensive effort, resources and cooperation by different departments and/or organisations (e.g. transport operators). This resulted in a lower response rate from cities for tools such as the cross-domain survey and the FFS/SUMI spreadsheets. In order to mitigate this issue, all data collection tools have been pre-filled as much as possible by both domain experts and country managers and cities have been provided with the assistance and support of country managers throughout the data collection phase. In addition, country managers have stepped in for cities that had stopped cooperating (please refer to section 2.2.2 for further details) by filling in the data collection tools via desk research, to the best of their capacity.

In this regard, it is important to specify that it has not been possible to validate all data collected for this study. Part of this data in fact, has been gathered by domain experts and country managers through desk research. The information found online on websites, databases, reports, etc. may not be reliable as it could be incomplete or outdated. In order to mitigate this, cities have been asked to also validate the data collected online. However, for the same reasons explained in section 2.2.1, there will be always data lacking validation. For these reasons, some results of the study should be interpreted with caution.

Review of data collected, both qualitative and quantitative, during Task 1 revealed that while some of the information was easy to find, the consistency of well-documented and available data was insufficient. In most instances there were no indicators available and where they were available, the information did not have the correct geographical scope (country instead of city/urban area focus) or date range as desired, e.g. the Sustainable Urban Mobility Indicators (SUMI).

The study required the involvement of several actors for the data collection phase, some of which were less experienced and knowledgeable on the study’s subject; a lack of specific knowledge or awareness of the four domains and the topics covered in tools may have hindered the process of data gathering. To avoid this risk, the domain experts developed detailed guidelines for country managers, explaining carefully each task that had to be performed by them. In the case of municipalities instead, both domain experts and country managers have been supporting cities by responding to any request for clarification cities might have had throughout the data collection process.
3. STATE OF PLAY ON URBAN MOBILITY

3.1. Level of support from member states on urban mobility

This section presents the results of the analysis of the current situation of Member States with regards to urban mobility.

The aim of the analysis, by building on the results of previous projects and studies (i.e. CIVITAS PROSPERITY, CIVITAS SUMPs-Up, evaluation of the 2013 Urban Mobility Package, etc.), was to rank Member States, depending on their current level of support for local mobility. Box 2 provides a brief overview of the scoring and colouring system that was used.

Box 2. Overview of scoring and colouring system

Each Member State was assigned a score ranging from 0 to 1. The image below presents the process followed in order to determine the score for each Member State.

Figure 6. Process to determine the score for each Member State

<table>
<thead>
<tr>
<th>RANKING OF MEMBER STATES</th>
<th>LINK BETWEEN NATIONAL FRAMEWORKS AND STUDY DOMAINS</th>
<th>NUMBER OF SUMPs PER MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sum normalised scores obtained in previous two phases by each MS to obtain final score.</td>
<td>1. Fill in the national framework survey per MS</td>
<td>1. Calculate the rate of presence of SUMPs in medium and large cities (&gt;50,000 inhabitants) per MS</td>
</tr>
<tr>
<td>2. Divide MSs into the following 4 categories based on their final score: inactive, average, active and frontrunners</td>
<td>2. Count the total number of questions with positive answers per MS</td>
<td>2. Normalise the rate into a score between 0 and 1 with the following formula: $\frac{N_o}{N}$ of SUMPs in cities with 50,000+ inhab. $\div$ $\frac{N_o}{N}$ of cities with 50,000+ inhab.</td>
</tr>
<tr>
<td>3. Rank MSs according to their category</td>
<td>3. Normalise the sum in to a score between 0 and 1 with the following formula: $\frac{\Sigma \text{scores in Member State sheet MS}}{\Sigma \text{scores in Member State sheet RP MS}}$</td>
<td></td>
</tr>
</tbody>
</table>

Member States, based on their final score, were assigned one of the following categories:

0 - 0.46: [Inactive] This means that the Member State has no plan or is doing very little on the respective topic. This category is presented in the comparison maps using the colour red.

0.43 - 0.53: [Average] This score is given to a Member State if it is doing an effort comparable to the average of Member States efforts. This category is presented in the comparison maps using the colour light blue.

0.53 - 0.65: [Active] This score is given to a Member State if it is doing more than the average of Member States efforts. This category is presented in the comparison maps using the colour dark blue.

0.65 - 1.00: [Frontrunner] This score is given to a Member State if it is doing more than average on the respective topic and is seen as leading in this area. This category is presented in the comparison maps using the colour green.

Please note, scores of respective Member States are based on limited data. While some Member States have validated the information collected or provided detailed information held by national governments and agencies, this is not consistent across all Member States. As a result, the maps displayed in this section should be interpreted with caution.
The assessment, as shown in the map, has identified that, in term of level of support on urban mobility issues, the countries of: Malta, France, Italy, Belgium, Romania, The Netherlands and Denmark are classified as "Frontrunners"; while, Spain, United Kingdom, Cyprus, Slovenia, Slovakia, Czech Republic, and Estonia are “Active”; Germany, Austria, Hungary, Poland, Lithuania and Bulgaria and Greece are “Average”. Sweden, Croatia, Finland, Luxembourg, Latvia, Ireland, Portugal and are “Inactive”.

The next chapters present a breakdown of the analysis’ results for each of the two phases that allowed to come up with the ranking of Member States.

3.2. Number of Urban Mobility Plans or SUMPs in place per MEMBER STATE

According to our analysis, the total number of Sustainable Urban Mobility Plans (SUMPs) - which are policy document at the local or regional level to increase urban accessibility and quality of life - in the European Union is 1,116 (this includes both SUMPs currently in developments and the ones that have already been adopted). Annex I provides a breakdown of the number of SUMPs for each Member state.

In order to determine this, a multi-step approach was followed which consisted in firstly, drawing information collected on SUMPs during the analysis at the local level. However, as the data collection was limited to 125 cities - which represent a minor share of all EU cities - the analysis has been extended by recurring to the following data sources:

Results from the CIVITAS PROSPERITY and SUMPs-Up projects;
Eltis City Database;
Endurance Database;
National SUMP databases, specifically:

- **Czech Republic**: City changers – SUMPs in the CR;
- **Italy**: Osservatorio PUMS;
- **Spain**: Inventario de Planes de Movilidad & Urbana Sostenible (PMUS) en España;

It is important to mention that, except for the 125 cities included in the study, the information from the data sources listed above has not been validated by the Member States and therefore it should be treated cautiously.

In order to compare and categorise Member States, based on the level of presence of SUMPs, a normalised score was calculated, as shown in Box 3.

**Box 3. Overview of scoring system for Urban Mobility Plans or SUMPs presence**

In order to be able to compare the different Member States, the number of Urban Mobility Plans or SUMPs in cities with 50,000 or more inhabitants has been put in relation with the number of cities with the same dimension per MS. This allowed to calculate a normalised score.

\[
\text{Normalised Score Number of SUMPs MS}_i = \frac{N^\circ \text{ of SUMPs in cities with 50,000 + inhab.}}{N^\circ \text{ of cities with 50,000 + inhab.}}
\]

Based on the normalised score achieved, Member States were assigned to one of the following categories: frontrunner, active, average, inactive. Please refer to Box 2 for a description of each category.

The map below illustrates the index on the presence of SUMPs in each Member State:

**Figure 8. Presence of Urban Mobility Plans in the EU**
The Member States that, from the analysis, appear to have the greatest presence of Urban Mobility Plans or SUMP for cities more than 50,000 inhabitants are the following: Romania, Denmark, Slovenia, Slovakia, Cyprus, Estonia and Malta while Ireland, Latvia, The Netherlands, Germany, Croatia And Luxembourg appear as the countries with the lowest presence of SUMP. These results, with the exception of Germany, may be due to the fact that MSs with the largest number of SUMP are the countries with the highest number of cities with 50,000 or more inhabitants. Moreover, the results illustrate the relative presence of SUMP as the analysis relates to the actual number of cities in the country (for instance Cyprus appears as frontrunner due to also the limited number of cities in the country).

**Box 4. Result comparison with support study for the evaluation of the urban mobility package**

The final report of the support study for the evaluation of the Urban Mobility Package (UMP) provides a different ranking of MS when it comes to the implementation of SUMP. This is due to the following reason:

- This study has calculated the level of presence of SUMP in cities with 50,000 or more inhabitants and several data sources have been used (i.e. Eltis city database, Endurance database, national SUMP databases and data capture during the analysis at the local level on 125 sampled cities).
- The UMP evaluation, on the other hand, has not considered the number of SUMP but the degree to which SUMP have been implemented (this was analysed on the basis of the number of SUMP developed and the degree to which they have incorporated the main principles of the UMP pillars - urban ITS, urban logistics, urban road safety and urban access regulations). In addition, the UMP evaluation has only used one data source, Eltis.

**3.3. 3.3 Link between national frameworks and study domains**

This section presents the results of the analysis of the relationship between national frameworks affecting urban mobility and the three domains (UVAR, SUMP, SULP). Domain D, being a set of urban mobility related data and data collection practices, is not being assessed as part of this task.

In order to evaluate this link, an assessment tool, the National Framework survey, was developed (provided in Annex G and briefly described in Box 5). The results of this survey for each Member State have been represented in the Member State sheets (Annex E).

**Box 5. National Framework survey**

The National Framework survey assesses the link between the national frameworks of MS under the three domains. The fourth domain (Data collection/ Indicators) was not considered as a separate domain since this topic was treated horizontally for the three domains as part of the section on “Monitoring and research”.

The survey included the following seven sections, called macro-areas:

- Platform
- Cross-sector cooperation and leadership
- Guidance and roadmap
- Finance
- Monitoring and research
- Custom advice and support

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2 National frameworks are all those documents, which may be of a normative nature or not, which regulate the above-mentioned domains at a national level.
It should be noted that the information presented in this chapter should be interpreted with caution as the analysis is based on data partially validated. This data in fact, was initially collected through desk research from previous studies or EU and National databases (e.g. CIVITAS Prosperity project, Higher Levels of Government – their Support for SUMP in the EU and the CIVITAS SUMPs-Up project, the website urbanaccessregulation.eu) and has been partially validated by Member States. The Member States sheets in fact, have been sent to the respective Expert Group on Urban Mobility\(^3\) (EGUM) member to ensure the information presented is both up to date and correct. Overall, 9 Member State sheets have been verified as shown below and in Annex E:

1. Finland;
2. France;
3. Greece;
4. Italy;
5. Latvia;
6. Malta;
7. Poland;
8. Portugal;

Box 6. Scoring system for the link between national framework and study domains

Based on the score totalised by each MS in the national framework survey (please refer to Box 5 for further details), a normalised rate was calculated by dividing the total score achieved by each MS by the maximum score reached by the best performer (BP) MS (Germany in this case), as shown in the following formula:

\[
\text{Normalised Score National Framework } MS_i = \frac{\sum \text{scores in Member State sheet } MS_i}{\sum \text{scores in Member State sheet } BP \text{ MS}}
\]

Based on the normalised score achieved, Member States were assigned to one of the following categories: frontrunner, active, average, inactive.

Please refer to Box 2 for a description of each category.

\(^3\)European Commission, Expert Group on Urban Mobility, 2020
The map below shows the normalised scores (calculated as shown in the box above) achieved by each MS in the national framework survey (please refer to Annex E for a detailed breakdown of each Member State score).

Figure 9. Link between national frameworks and the topics SUMP, UVAR and SULP in the EU

As shown in the map, the countries that have achieved the highest score in terms of comprehensiveness and supportiveness of their National Frameworks for urban mobility are Italy, Germany, Belgium, Germany, Romania and Czech Republic. The Member States instead, with the lowest score are Cyprus, Malta, Ireland, Croatia, Luxembourg, Latvia and Lithuania. For a breakdown of results for each Member State, including the score achieved for each section of the survey and each domain, please refer to Annex E.

The box below provides an indication of the scores of each MS for each section analysed.
The following sections present the results of the National Framework survey for each of the 7 areas of analysis.

### 3.3.1 Domain A - Sustainable Urban Mobility Planning

This section presents the results of the National Framework survey concerning the domain SUMP for each of the 7 areas of analysis. Box 9 summarises the overall results of the survey followed by a detailed description of each of the 7 areas of analysis in relation to SUMP.

### Box 8. Overall results of National Framework survey for domain A – SUMP

The image below showcases the overall results of the National Framework survey for each element investigated by the 7 areas of analysis in relation to SUMP. The numbers in the image represent the number of Member States where these elements are present (for example, 19 Member States have a website on SUMP).
**Platform**

It was observed that 68% of Member States have dedicated websites providing information on SUMP. Some countries instead, provide this information on their respective Ministry of Transport websites (e.g. Portugal) or alternatively, the information is available on other websites; in Finland, for example, the information on SUMP is available on the website of the Finnish national Land use, Housing and Sustainable Transportation Network.
The use of **social media** to communicate information on SUMP is still uncommon; in fact, social media accounts on such topic exist in only 21% of Member States. This includes The Netherlands, Romania and Sweden.

It was observed that 36% of Member States, including Belgium, Czech Republic and France, have a national **newsletter** on SUMP.

Additionally, the analysis has shown that 64% of Member States organise national **conferences** on SUMP: Poland, for example, has organised its last national conference on SUMP in 2019 and this was financed by the CIVITAS PROSPERITY project. Denmark instead, arranges twice a year the Danish Mobility Network where municipalities, region and transport companies meet.

Lastly, **cooperation and exchange of information with key stakeholders** (e.g. best practice, networking, etc.) seems widely popular for SUMP as 89% Member States do so (an example of network for SUMP is provided in the box below).

**Box 9. Best practice - Platform**

<table>
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<th>SUMP promotion with social media in Romania</th>
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| Social networks like Facebook, Twitter, Instagram, etc. provide citizens a continuous and enhanced ability for quick communication and interaction. Such networks are therefore an important tool for the promotion of SUMP policies and measures and for the engagement of citizens in the local and national policy development. In Romania, the potential of using the major social media network in SUMP promotion has been constantly increasing since 2016 when the first SUMP development wave kicked off. There are several established instances for providing visibility through social media networks in the SUMP development context. In many cases, there is no exclusive social media account exclusively dedicated to the SUMP topic, but it is embedded in an institution, public authority or organisation existing social media account. In other cases, a city SUMP provides for a full web presence through a dedicated website and linked social media accounts. Social media channels area tool used by the Regional Development Agencies (ADR) who manage the financial and monitoring side of the urban mobility projects implemented in cities. An aspect that still needs improvement is related to the cross-reference and interlinkage between the diverse social media accounts. An improved integration of public information can ensure a more transparent and comprehensive communication and information exchange with the final users: the citizens.

Below are provided examples of social media accounts used for the promotion of SUMPs in Romania:

- **CIVINET Romania**: With 25 active members, the CIVINET Romania national network is actively using social media for promoting the CIVITAS principles on sustainable urban mobility towards local public administrations and other stakeholders involved in the SUMP move in Romania. Many participants at events organised by the network are reached through the social media promotion.
  - Social media account: [https://www.facebook.com/civinet.ro](https://www.facebook.com/civinet.ro)
- **Planul de Mobilitate Urbană Durabilă București-Ilfov**: The capital city Bucharest together with its metropolitan area Ilfov created a web package in the framework of the SUMP development in 2016. A dedicated website and associated social media presence on the major networks have ensured a good level of communication towards citizens throughout project implementation phase.
  - Social media account: [https://www.facebook.com/Planul-de-mobilitate-urban%C4%83-durabil%C4%83-PMUD-Bucure%C8%99ti-Ilfov-954861951236183/](https://www.facebook.com/Planul-de-mobilitate-urban%C4%83-durabil%C4%83-PMUD-Bucure%C8%99ti-Ilfov-954861951236183/)
- **Apix.ro**: The municipality of Iasi integrated their SUMP development process into the ongoing urban development policy package. By using the existing Apix platform and the associated social media accounts, the municipality ensured a high visibility for the urban mobility projects planned.
  - Social media account: [https://twitter.com/apix_iasi](https://twitter.com/apix_iasi)
Legislation for the development of websites and E-Platform for SUMPs

In Greece, the SUMP law (art. 22, law 4599/2019) already promoted the creation of websites on SUMPs by requesting the establishment of a dedicated SUMP website for each Municipality or Regional Authority preparing a SUMP. In addition, the new Greek law on SUMP (4784/2021), published in March 2021 by the Ministry of Infrastructure and Transport, foresees the launch of an E-Platform for SUMPs. The E-Platform will serve, inter alia, as a national platform for collecting all Greek SUMPs.

SUMP network LILI

In Estonia there is the SUMP network LILI (Linnad ja liikuvus which stands for “Cities and Mobility”). LILI is a network of more than 50 people, representing cities, NGOs, consultancies, research organisations and national ministries that meet once or twice a year for inspiration, information exchange and training on SUMP related topics.

Cross-sector cooperation and leadership

The analysis had identified that in 50% of Member States politicians are involved in programmes and policies regarding SUMP. There is a greater involvement of Ministers: in fact, in 75% of Member States, ministers are involved in programmes and policies regarding such topics.

The type and level of involvement, although, differs between countries: in some (e.g. United Kingdom and Ireland) the Ministry of Transport is responsible, as a whole, of urban mobility policies while in other cases, these competencies are fragmented (e.g. Belgium). Ministries can have a strong involvement in the development of urban mobility strategies: in Spain for example, the Ministry of Transport and Mobility has been responsible for the elaboration and implementation of the Urban Agenda which promotes SUMPs. Moreover, the involvement of public authorities may be active or passive (i.e. as an observer) in national and international projects as a way to capture good practices and ensure cross-sector cooperation or a direct involvement in projects for the proposals of new laws (e.g. SUMPs mandatory for medium and small cities).

Furthermore, in 54% of Member States, including Greece and Finland, there is a presence of synergies with other policy documents (i.e. intelligent transport system measures) at the national level concerning SUMP. In Greece, a national law prescribes the integration of SUMPs with other planning documents and processes such as Master Plans, Climate Change and Development Studies, Strategic Documents and national policies related to transport, road safety, SDG’s, etc, as well as local authorities’ strategic and business plans, etc.

Box 10. Best practice - Cross-sector cooperation and leadership

The involvement of central authorities regarding programmes and policies on SUMPs

In the new Sustainable Transport Development Strategy 2030, developed by the Polish central government, one of the urban transport priorities is promoting the development and implementation of SUMPs by cities and functional areas. From 2017 to 2019, the Ministry of Infrastructure participated as an observer in the EU project CIVITAS PROSPERITY, to promote and develop SUMPs. Since 2019, as part of the cooperation at the central government level, a pilot is being implemented to support municipalities in the preparation of SUMPs, with the involvement of Jaspers Initiative and the Center for EU Transport Projects. Additionally, the Expert Council for Sustainable Urban Mobility Plans operates in the Ministry of Infrastructure, from 2019, with consultative and advisory tasks.
Introduction of first Romanian Urban Policy

Romania is currently developing its first urban policy, which will be implemented later in the year (2021). The policy is being created with the aim of being a tool to strengthening administrative capacity and strategic planning of urban areas in Romania. The project is being carried out by the Ministry of Public Works, Development and Administration, with the support of the World Bank, under a technical assistance agreement.

A platform, www.citadini.ro, has been developed to collect ideas and proposals for the urban policy. In addition, it allows for urban development specialists and enthusiasts to connect, discuss and access the resources provided by the platform.

The main tools provided by the policy will include:

- Urban databases (database containing almost 1,000 indicators proposed for the evaluation of Romanian urban areas);
- Estimated capital investment budgets;
- Project prioritisation methodology;
- Reports.

Guidance and roadmap

It was observed that 79% of Member States have developed documents to orientate and homogeneously guide central and local policy makers, as well as municipalities, on SUMP. There are a few countries still, including Croatia and Czech Republic, where national guidelines on the preparation of SUMPs appear to not exist. Possible reasons for this include public participation and technical skills being limited with respect to the preparation of guidelines on SUMPs.

Several differences were found between the guidance documents of the different Member States. Firstly, some countries, including Bulgaria and Malta, have created their guidelines by simply translating EU level guidelines into their respective languages, adapting it to the national legislation, and adding local best practices while others - including Belgium, Denmark and Spain - have developed their own country-specific documentation. For instance, Spain has developed the country-specific guidance “Practical guide to elaborate SUMP” and “guide on commuting plans” (which has been updated in 2019). Regarding the specific content of the guidelines, 57% of Member States include a clear methodology, 50% include best practices, 32% include objectives to be achieved by cities and 25% include a national work plan with milestones to be achieved.

Box 11. Best practice - Guidance and roadmap

Belgium is a positive example of the development of guidance documentation on SUMPs. The guidelines for the L-SUMPs (the equivalent of the EU concept of SUMPs) include in an overall mission and vision the definition of the conditions for sustainable mobility. They include 5 strategic objectives (accessibility, mobility for all, traffic safety, liveability, environmental and climate protection) and 4 main basic principles (hierarchy of modes - walking > cycling > public transport and car sharing > private car -, public participation, quality assurance and control - process and content - and financing conditions). L-SUMPs have a planning horizon of 10 years with a vision focus of 30 years. Documents have two legal parts: the informative part containing research, analysis and vision and the steering part containing scenarios, priorities, operational targets and action plan. The measures are grouped into 3 working domains: spatial planning, mobility networks and accompanying measures (e.g. enforcement, mobility management, services). All stakeholders involved share responsibility which means cooperation and common decision making become most important and are thus an integral
part of the institutional cooperation process. Furthermore, a dozen of thematic handbooks ('vademecia') support the planning and implementation/design of L-SUMP measures. There are separate documents on parking, bicycle infrastructure, bicycle networks and bicycle parking, road design, public domain design, traffic calming, school vicinities, Mobility Effect Reporting.

Guidelines for the French SUMP "PDU"

The French SUMP concept, called PDU (plan de déplacements urbains), was introduced in 1982, and made mandatory for large cities (over 100,000 inhabitants) in 1996. The concept of SUMP, which was developed later, shows many references to PDU and can be described as being equivalent.

As a support measure, the French Ministry for Transport has since continuously financed the Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement (Cerema) (previously named "Certu") to elaborate appropriate methodologies and to identify and promote best practices related to PDU in all its thematic dimensions. Guidelines are provided in French, some of them also translated in other languages.

Recent documents developed by Cerema, include:
- CERTU (2013). Mobility and transport: focus on - sheets N° 27 - 30 years of sustainable urban mobility plans (PDU) in France;
- CEREMA (2017). Mobility and transports Tools and Methods n°1 PDU : the French urban mobility plan Integrating transport policies Mobility and transports: Tools & Methods;
- CEREMA (2012). Mobility and transports - Local practices: Sheet n° 2 Assessing SUMP:s: converging approaches for a complex reality;
- Cerema (2015). Mobility and transports, Local practices, Sheet n° 3 - Involving citizens in the SUMP process. Challenges and recent trends in French PDUs;

Finance

Financial and support schemes at the national level for SUMP are available in 82% of Member States. Generally, in order to fund this support, Member States make use of both national and EU funding, although this may vary, depending on the Member State. Almost all Member States use EU financial resources (especially EU cohesion and structural funds) although funding is implemented through different means. For instance, the Slovenian Ministry of Infrastructure has assigned part of its cohesion funds for the development of SUMPs and for the implementation of sustainable mobility measures based on SUMPs. In Slovakia, from 2015 onwards, cohesion funds have been the backbone for the development of SUMPs.

Countries, such as The Netherlands, Italy and Germany, provide financial support at national level but also at regional and local level. On the other hand, there are a handful of countries that still do not provide financial support at the national level; Sweden, for example, only provides funding at the regional or local level and in Latvia local financial support is available.

It was observed that 32% of Member States offer support and tools at the national level when applying for funding for SUMP. The SUMP is also a common pre-condition to access funding in several Member States, with 43% of countries providing financial support and tools at the national level conditional on the implementation of the policy. In Romania, for example, SUMPs are pre-conditional to access financing through the Regional Operational Programme and in Hungary, since 2014, SUMP has become a pre-condition for cities to access cohesion funds for specific urban mobility projects.

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4 Source: Higher Levels of Government – their Support for SUMP in the EU
Box 12. Best practice - Finance

<table>
<thead>
<tr>
<th>Availability of funding conditional on SUMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having an approved SUMP and trained mobility department/staff may also be a precondition for obtaining specific operational subsidies or grants. For example, in the Walloon Region, credit lines dedicated to the improvement of cycling networks are allocated as long as the city has an approved SUMP and trained public servants on mobility topics. Other financial incentives and (legal) preconditions in Belgium include:</td>
</tr>
<tr>
<td>• In the Flanders Region:</td>
</tr>
<tr>
<td>o L-SUMP (new) plan or study receive up to 100% grant;</td>
</tr>
<tr>
<td>o 2nd generation update (broadening or deepening) receive a 50% grant;</td>
</tr>
<tr>
<td>o Co-financing for local level priority projects; e.g. redesign of school vicinities, site-based travel plans, multimodal access to e.g. business areas, cycle networks improvement.</td>
</tr>
<tr>
<td>• In the Brussel Region the financing of many actions is regulated via ‘acts’ that are attached to the overall covenant (Regional cooperation guidelines). Only if L-SUMP actions contribute to the overall regional plan objectives (IRIS 3 – Good Move Brussels) they get subsidised. The Regional Mobility Commission (a body similar to a SUMP Task Force) gives advice while the final decision lies with the Ministry (Department of Mobility).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Klimaaktiv mobil - the National Action Programme for Mobility Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klimaaktiv mobil is the Austrian Action Programme for Mobility Management to reduce CO₂ emissions, to promote environmentally friendly and energy efficient mobility and to stimulate new innovative business opportunities and green jobs.</td>
</tr>
<tr>
<td>The Klimaaktiv mobil programme provides financial support to Austrian businesses, fleet operators, and property developers as well as towns and cities, municipalities and regions, and relevant actors in tourism, school and youth initiatives. This programme promotes an environmentally friendly mobility transition towards electric mobility, cycling, intelligent mobility management and innovative mobility services.</td>
</tr>
<tr>
<td>The programme has already provided €88.9 million for mobility projects, from the funds of the Federal Ministry of Agriculture, Forestry, Environment and Water or Life Ministry (BMLFUW) via klimaaktiv mobil, the Climate and Energy Fund and the Austrian environmental support scheme, including €1.4 million from EU funds (EAFRD), having triggered an investment volume of €510 million.</td>
</tr>
<tr>
<td>In addition to financial support, klimaaktiv mobil also offers consulting and awareness-raising programmes, partnerships as well as training and certification initiatives.</td>
</tr>
</tbody>
</table>

**Monitoring and research**

It was observed that 46% of countries have in place a monitoring system at the national level for SUMP. Generally, a set of indicators for monitoring are provided in guidance documents developed by the central government. The analysis has shown that currently, France, Portugal, Sweden, UK and Malta have a set of indicators defined for monitoring and evaluation of SUMPs or mobility in general (please refer to Box 11 for examples of indicators). There are also 4 further countries and regions, Slovenia, Finland, Walloon in Belgium, Slovakia, with guidance in place that suggest possible indicators and/or encourages their use.

**Monitoring is seldom mandatory** in Member States; in fact, monitoring is required for SUMP in 29% of countries. The existence of a requirement for monitoring can offer several benefits. In Belgium, for example, a mandatory monitoring and evaluation tool in place in combination with a reliable quality control process, is contributing effectively to the continuous progress of most of the L-SUMPs in Flanders.
While a monitoring system in place seems common in Member States, *sanctions in case of a lack of monitoring* are not. The analysis in fact, have not identified sanctions in any of the countries.

Lastly, *research programmes and collaborations with education or research institutions* on SUMP are present in a number of Member States. Research programmes on SUMP exist in 36% of countries and collaborations in 32% of countries. For example, in Croatia, the FTTS and the Department of Urban Transport have completed three scientific research projects funded by the University of Zagreb: Development of Sustainable Urban Mobility Plans (2013-2014) and Analysis of the Role of Public Transport in Sustainable Urban Mobility (2014) and Evaluation of impacts of strategies and measures for sustainable transport in cities (2015).

**Box 13. Best practice - Monitoring and research**

<table>
<thead>
<tr>
<th>Monitoring of PMT (SUMPs)</th>
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</table>
| Even though not mandatory, guidance for the Portuguese version of SUMPs (PMTs) include a set of recommended indicators that cities may use as a base for the monitoring and evaluation of their SUMPs. The set consists of 22 suggested indicators, including:  
  - % of PT fleet adapted to people with reduced mobility;  
  - Average commuting time (minutes);  
  - Number of passengers of PT (annual);  
  - Modal split for commuters / students;  
  - Average age of PT fleet;  
  - Number of accidents by pedestrians and cyclists;  
  - Motorisation rate;  
  - Number of movements of PT services at peak hours / night;  
  - % of PT stops with information available (by mode);  
  - Index of passenger satisfaction;  
  - Update of cycling network (m / 100 inhabitants). |

The full list is available in the guidance document, *Guia para elaboração de planos de mobilidade e transportes*.5

<table>
<thead>
<tr>
<th>National transport indicators (including for the monitoring of SUMPs)</th>
</tr>
</thead>
</table>
| In the UK, the national government sets mandatory indicators6 (national indicators), that must be combined with local indicators, for monitoring purposes. The 10 transport indicators in the national indicator set are:  
  - Decrease in the share of fatalities or serious injuries in the total number of road accidents recorded;  
  - Decrease in the percentage of children killed or seriously injured in the total number of registered road accidents;  
  - Average travel speed during the morning rush hour;  
  - Percentage of major highways where maintenance should be considered;  
  - Percentage of non-mainline highways where maintenance should be considered;  
  - Level of access to services and facilities by public transport, walking and cycling;  
  - Level of access to employment by public transport, walking and cycling;  
  - Number of trips by local bus and light rail;  
  - Average waiting time for bus services;  
  - Usual mode of transport for children home-school journeys. |

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5 Source - *Guia para elaboração de planos de mobilidade e transportes*

6 Source - *National Indicators for Local Authorities and Local Authority Partnerships*
Custom advice and support

It was observed that in 71% of Member States, technical assistance is offered to support municipalities and regions with the SUMP process.

In some countries, including Spain, Greece and Portugal, offices in the ministries are responsible for the provision of such custom advice and support while in Finland the Finnish national Land use, Housing and Sustainable Transportation Network (NHT) is in charge of aiding municipalities.

The type of support provided varies between countries. Austria, for example, provides consultation and education tools and Spain, similarly, organises workshops and training on SUMPs for local planning authorities. Furthermore, in Greece the ministry provides guidance when municipalities request for information regarding the implementation of the SUMP law and in Portugal, municipalities are able to make a voluntary submission to the Ministry of Transport (IMT) for an evaluation of their SUMP. Some other examples of technical assistance are illustrated in the box below.

Box 14. Best practice - Custom advice and support

<table>
<thead>
<tr>
<th>Example of custom advice and support</th>
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</thead>
<tbody>
<tr>
<td>In Greece there are two SUMP laws: law 4599/2019 and law 4784/2021 (the most recently published, more detailed in terms of methodology and guidance). These laws, together with the Eltis guidelines, provide support to municipalities and regions. Furthermore, the Ministry provides guidance to cities that request information regarding the implementation of the SUMP law.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Example of custom advice and support</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Ministry in Slovenia has developed a national platform for sustainable mobility. The platform is a service for experts from cities, municipalities and regions and different consultants helping the development of SUMPs. The platform offers, for example, national guidelines for SUMPs, regular lectures, training and workshops, news and coordination with the European Mobility Week.</td>
</tr>
</tbody>
</table>

Legal and technical framework

In 43% of Member States one or more national laws on SUMP are present. Some of these laws, make SUMPs mandatory for cities and/or regions. In some cases, SUMPs are mandatory for all cities, towns and metropolitan areas (for instance, in France) while for other countries, SUMPs are mandatory only in some regions (Cataluña, Comunidad Valenciana and Balears in Spain, and England in United Kingdom) or in cities with a minimum number of inhabitants (e.g. SUMP is mandatory in France for urban areas of over 100,000 inhabitants). On the other hand, there are still some Member States - such as Austria, Slovenia and Portugal - where there is no legal obligation for local authorities to implement SUMPs. The figure below maps the countries where there is a legal requirement for SUMPs.
Lastly, the analysis has identified that in 68% of countries a supervisory body at the national level on the specific topic is present.
3.3.2 Domain B – Urban Vehicle Access Regulations

This section presents the results of the National Framework survey concerning the domain UVAR for each of the 7 areas of analysis. Box 16 summarises the overall results of the survey followed by a detailed description of each of the 7 areas of analysis in relation to UVAR.

Box 15. Overall results of National Framework survey for domain B – UVAR

The image below showcases the overall results of the National Framework survey for each element investigated by the 7 areas of analysis in relation to UVAR. The numbers in the image represent the number of Member States where these elements are present (for example, 16 Member States have a website on UVAR).
Platform

It was observed that 57% of Member States, including Luxembourg, Greece and Latvia, have dedicated websites providing information on UVAR. This information can be otherwise provided on municipality’s websites. Otherwise, if a dedicated website is not available, the information may be found on the Urban Vehicle Access Regulations’ website, provided by CLARS (Charging, Low Emission Zones, other Access Regulation Schemes).

The use of social media to communicate information on UVAR is still uncommon; in fact, social media accounts on such topic exist in only 32% of Member States. This includes France, Lithuania and Portugal.

Furthermore, the analysis has identified the lack of a national newsletter on UVAR in nearly all countries; in fact, only 14% of countries have respectively a national newsletter on such topic (France, Malta, The Netherlands and the United Kingdom).

Moreover, the organization of events and conferences on UVAR at the national level is also common, with only 11% of countries doing so.

Lastly, in 25% of countries the cooperation and exchange of data on UVAR with key stakeholders occurs. For example, in Czech Republic there is an international network on UVAR as Czech and German stickers are mutually accepted. Also, in Finland there has been cooperation and exchange of information on UVAR in EU CEF go-financed NordicWay 3 project 2021-2023, funded by Finnish authorities and cities.

Box 16. Best practice - Platform

Projects promoting cooperation and exchange of information

Projects can allow cooperation and exchange of information between key stakeholders, like in the case of Finland. The EU CEF go-financed NordicWay 3 – running for the period 2021-2023 – is a project funded by Finnish authorities and cities enabling cooperation and exchange of information on UVAR. NordicWay 3 is a C-ITS pilot project that enables vehicles, infrastructure and network operators to communicate safety hazards and other information from roads in the Nordic countries between different stakeholders. The project is a collaboration between public and private partners in Finland, Norway, Sweden and Denmark.7

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7 NordicWay website
Informal cooperation and exchange of information

Cooperation and exchange of information may occur through both international recognized networks (e.g. ELTIS) but also through informal networks. In Italy, for example, some informal networks of cooperation have been established on UVAR. These networks include associations (e.g. FLC, TTS, etc.) or lobbies (e.g. WWF, MOTUS-e, etc.) where practices, bottlenecks, developments, etc. are shared between users.

**Cross-sector cooperation and leadership**

The analysis had identified that in 39% of Member States politicians are involved in programmes and policies regarding UVAR. For example, politicians are very much involved in the decision of UVAR schemes, as the German “Umweltzone” (“environmental zone”) is obligatory in many German cities.

There is a medium involvement of ministries: in fact, in 43% of countries ministers are involved in programmes and policies regarding such topic. The involvement of public authorities on UVAR has been in a more or less active role, in national and international projects as a way to capture good practices and ensure cross-sector cooperation or a direct involvement in projects for the proposals of new laws (e.g. LEZ mandatory for cities with more than 50,000 inhabitants, etc.).

The presence of synergies with other policy documents, in the case of UVAR, can be found in 39% of countries, including Bulgaria, Czech Republic and Denmark.

**Guidance and roadmap**

The presence of national guidance on UVAR is still relatively low; it is currently available respectively in 43% (this includes The Netherlands, Italy and Germany).

Regarding the specific content of the guidelines, the analysis has identified that these documents are not as developed as in the case of SUMP. Concerning UVAR in fact, only 29% of Member States include a clear methodology, 14% include measures to be taken and a national work plan with milestones to be achieved, 11% objectives to be achieved by cities and 7% include best practices.

**Finance**

Concerning UVAR, the analysis has identified a lack of availability of financial support and instruments for the development and implementation of the above-mentioned domains in nearly all countries: in only 21% of these, financial and support schemes are available for UVAR. Furthermore, 11% offer support and tools when applying for funding for UVAR. Lastly, receiving financial support and tools conditional to the implementation of the UVAR policy is extremely uncommon, with only 7% of Member States having such requirements.

**Monitoring and research**

It was observed that 46% of countries have in place a monitoring system at the national level for UVAR. The analysis has found that generally, the main indicator for the monitoring of UVAR schemes is “air quality”. In France, for example, monitoring of air quality is carried out at national level by the Ministry of Environment and The Agence of Ecological Transition (ADEME). Monitoring is seldom mandatory in Member States; in fact, monitoring is required for UVAR in 18% of countries.

While a monitoring system in place is present in 36% of Member States sanctions in case of a lack of monitoring are less common. The analysis in fact, has identified sanctions in only 4% of countries.
Lastly, research programmes and collaborations with education or research institutions on SUMP are present in a number of Member States. Research programmes and collaborations on UVAR exist in 11% of countries.

Custom advice and support

The analysis revealed that in 21% of Member States, technical assistance is offered to support municipalities and regions with UVARs. For example, in Denmark technical assistance is provided concerning the implementation of greener public transport and low emission zones, including measures on lorries and heavy-duty vehicle.

Legal and technical framework

One or more national laws on UVAR are present in 46% of countries. Sometimes, laws be limited to specific municipalities or urban areas (e.g. Denmark) or applicable to the entire territory (e.g. Austria, Czech Republic, etc.). In Spain, until now there has been no legal basis for the access regulations schemes at national level, and councils have been in charge of setting legal rules at local level. The new Climate Change Law, which is about to be adopted, makes it mandatory for cities to establish low-emissions zones before 2023. In addition, the national framework may affect only certain types of vehicles and emissions standard and timing vary per city. In Germany for example, it affects all motor vehicles except motorcycles.

A supervising body at the national level on the specific topic is present in only 11% of Member States.

Figure 11. Presence of a national framework for UVAR

Please note, this map was not developed with the use of another data source, the urban vehicle access regulations website. Results may therefore differ. This data source was deemed more reliable to develop the map as, as explained previously, the data collected through the national framework survey is only partially validated and must be interpreted with caution.
Box 17. Best practice - Legal and technical framework

**National legal framework on UVAR**

The Thirty-Fifth Ordinance on the Implementation of the Federal Emission Control Act (Ordinance on the marking of vehicles) as well as the Federal Emission Control Ordinance (35. BImSchV) are the national legal frameworks in place regarding vehicle access regulation in German LEZs. They were introduced to mitigate air pollution caused by PM and nitrogen oxide. The regulations set out the standards and vehicles affected, allowing federal state flexibility on implementation, in order to suit local conditions. Moreover, they set out provisions on the marking of passenger cars and commercial vehicles in accordance with the quantity of their particulate emissions. Each municipality can choose whether to implement a scheme and its scope.

**Promotion of vehicles powered by alternative fuels in Poland**

The Act of 11 January 2018 on Electromobility and Alternative Fuels established a system of incentives for the promotion of the use of vehicles powered by alternative fuels, mainly electricity, and also introduces mechanisms for initiating investments in the necessary infrastructure. This includes the possibility for a municipality with more than 100,000 residents, of introducing a clean transport zone, limited to the area of downtown buildings or a part thereof, constituting a cluster of intensive development in the city centre area. Entry to the zone is possible only for vehicles powered by electricity, natural gas and hydrogen, as well as for police vehicles, fire brigades etc. The city council, in the resolution establishing the clean transport zone, may establish its exemptions from the restriction of entry to the zone other than those already mentioned in the act. Due to the demands of the social side, the provisions on zones are currently being changed.

3.3.3 Domain C – Sustainable Urban Logistics Planning

This section presents the results of the National Framework survey concerning the domain SULP for each of the 7 areas of analysis. Box 19 summarises the overall results of the survey followed by a detailed description of each of the 7 areas of analysis in relation to SULP.

Box 18. Overall results of National Framework survey for domain C – SULP

The image below showcases the overall results of the National Framework survey for each element investigated by the 7 areas of analysis in relation to SULP. The numbers in the image represent the number of Member States where these elements are present (for example, 5 Member States have a website on SULP).
The analysis revealed that only 18% of countries, such as France and The Netherlands, have a specific website for SULP. The use of social media to communicate information on SULP is still uncommon; in fact, social media accounts on such topic exist in only 14% of Member States, including Belgium, France and Malta. The analysis has identified the lack of a national newsletter on SULP in nearly all countries; in fact, only 11% of countries have respectively a national newsletter on such topic. The organization of national events
and conferences on SULP is less common, with only 21% of countries doing so. In 36% of countries the cooperation and exchange of data on SULP with key stakeholders occurs.

**Box 19. Best practice - Platform**

<table>
<thead>
<tr>
<th>Technology platform on logistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria is a member of the European project ALICE, a technology platform that is set-up to develop a comprehensive strategy for research, innovation and market deployment of logistics and supply chain management innovation in Europe.</td>
</tr>
</tbody>
</table>

**Cross-sector cooperation and leadership**

The involvement of politicians and ministers in programs and policies concerning SULP is less common, with only 25% of countries. The presence of synergies is also not as common as the other domains, with only 29% Member States (e.g. Denmark, Finland and Germany).

**Box 20. Best practice - Cross-sector cooperation and leadership**

<table>
<thead>
<tr>
<th>Position paper on urban logistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>In December 2020 a position paper has been published by the Ministry of Transport and Italian Association of Municipalities dealing with implementation and policies on SULP and centralised schemes for UVAR. The document aims at being a first but fundamental step towards a better understanding of the challenges that central and local policy-makers face when developing sustainable mobility policies in urban areas, as well as providing guidance on the theme of urban logistics. The document includes specifically:</td>
</tr>
<tr>
<td>• Priority topics for urban logistics (including the involvement of stakeholders and KPIs and collection of data for monitoring);</td>
</tr>
<tr>
<td>• Directions for the development of integrated and resilient urban logistics (including access regulations and new logistics models for e-commerce);</td>
</tr>
<tr>
<td>• Putting in practice measures on urban logistics (e.g. problems to solve, KPIs, etc.);</td>
</tr>
<tr>
<td>• Actions that can be implemented straight away (e.g. single accreditation system for restricted traffic zones, continuous training for local officials, etc.).</td>
</tr>
</tbody>
</table>

**Guidance and roadmap**

The presence of national guidance on SULP is still rather low; it is currently available respectively in 36% of Member States (this includes Belgium, Portugal and Spain). In some countries (e.g. Slovenia and France) guidelines are not available but are currently being developed. Regarding the specific content of the guidelines, the analysis has identified that these documents are not as developed as in the case of SUMP. Concerning SULP in fact, only 25% of Member States include a clear methodology and 18% include measures to be taken, a national work plan with milestones to be achieved, best practices and objectives to be achieved by cities.

**Finance**

Concerning SULP, the analysis has identified a lack of availability of financial support and instruments for the development and implementation of the above-mentioned domains in nearly all countries: in only 18% of these, financial and support schemes are available for

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9 Ministero delle infrastrutture e delle mobilità sostenibili, Pubblicato il documento “La logistica urbana in una visione integrata”, 2021
SULP. Furthermore, 18% offer support and tools when applying for funding for SULP. Lastly the receipt of financial support and tools conditional to the implementation of the SULP policy is extremely uncommon, with only 7% of Member States having such requirement.

**Monitoring and research**

The analysis has shown that only 11% of Member States have a monitoring system in place for SULPs. In addition, the analysis has not identified sanctions in case of a lack of monitoring SULPs in any of the countries. Lastly, research programmes and collaborations with education or research institutions on each of the three topics are present in a few Member States. Specifically, research programmes and collaborations on SULP exist in 18% of countries. An example of a research programme is provided in the box below.

**Box 21. Best practice - Monitoring and research**

<table>
<thead>
<tr>
<th>Example of research programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>The national research programme, Future Mobility, is a mission-orientated initiative to help Austria create a transport system designed to meet future mobility challenges and thereby also addresses urban areas. In the research programme Future Mobility, under the subject area &quot;Goods mobility&quot;, numerous projects with a focus on sustainable city logistics were funded, e.g. on urban micro-hubs.</td>
</tr>
</tbody>
</table>

**Custom advice and support**

The analysis revealed that in 25% of Member States, technical assistance is offered to support municipalities and regions with SULPs. For example, in Belgium assistance on SULPs consists in support of action plans, case studies or knowledge sharing events.

**Legal and technical framework**

It was observed that 18% of Member States have developed laws on SULPs, such as in Greece, France, Italy and the United Kingdom. In Greece, for example, there is a national legal framework promoting city and green logistics.

Also, a supervising body at the national level on the specific topic is present in only 14% of Member States.
3.4 Overview at local level for key thematic areas

This chapter presents the results of the analysis of the current urban mobility situation at the local level for each of the four thematic areas. Please note, this section should be read alongside the indicator sheets developed of each domain (Annexes A, B, C and D).

3.4.1. Domain A – Sustainable Urban Mobility Planning

Sustainable Urban Mobility Planning is an essential part of the Urban Mobility Package. This section illustrates the current situation regarding SUMPs in the selected set of European cities with the final aim of providing a comprehensive description of the SUMP status in the European Union.

For the SUMP domain, data has been collected on all 125 cities through the SUMP self-assessment and the transport plan analysis. The SUMP self-assessment can only be filled in by city representatives themselves, by one person, several or a whole team who fills it in together. Therefore, all data coming from the SUMP self-assessment comes directly from the cities. The second pillar, the transport plan analysis, was conducted by the domain manager and the country managers which best know the language and the planning structures in a certain country. The transport plan analysis is a qualitative analysis of the planning documents based on a keyword search. The city’s validation of the transport plan analysis is not required as it is based on the available transport plan documents.

The 125 datasets include 83 complete datasets with both the SUMP self-assessment data and the transport plan analysis. For 5 cities only self-assessment data is available (for example, if no transport plan document for a deeper analysis was available). For 30 cities, only the data from the transport plan analysis is available (when the city has not
filled in the SUMP self-assessment). Lastly, 7 cities did not fill in the SUMP self-assessment and no transport plan was found through desk research. The SUMP self-assessment in fact, can only be filled in by one or several city representatives and therefore cannot be covered by desk research by the consortium. In total 83 datasets were validated by the cities themselves.

Regarding the indicators on COVID-19, the data was collected through the cross-domain survey, with a total of 61 datasets for the “SUMP provision of framework for COVID-19 emergency action planning” and a total of 70 for the “Impact of COVID-19 in the implementation of urban mobility measures”. As these data were mostly provided by cities themselves, such data are mostly validated.

The dataset allowed us to develop the following indicator sheets for SUMP (available in Annex A):

- Presence of local transport or mobility plan or equivalent document;
- Presence of a local transport plan compliant with the European SUMP Guidelines’
- Compliance of planning process with the principles of the European SUMP Guidelines;
- Consideration of TEN-T network aspects in the SUMP (or equivalent plan);
- Consideration of the functional urban area (FUA) in the SUMP (or equivalent plan);
- Consideration of other policies and plans in the SUMP (or equivalent plan);
- Consideration of road safety aspects in the SUMP (or equivalent plan);
- Presence of SMART targets and sustainable indicators for monitoring in the SUMP (or equivalent plan);
- Scope of transport plan;
- SUMP provision of framework for COVID-19 emergency action planning;
- Impact of COVID-19 in the implementation of urban mobility measures.

The figure below provides an overview of the results from the data collection on this specific domain. For the complete and detailed version of these indicators, please refer to Annex A.
Figure 13: Overview of results from the data collection on Domain A

- Presence of local transport or mobility plan or equivalent document:
  - Cities that have a local transport or mobility plan or equivalent document
  - Cities that don’t have a local transport or mobility plan or equivalent document

- Presence of a local transport plan compliant with the European SUMP Guidelines:
  - Cities with a local transport plan compliant with the European SUMP Guidelines
  - Cities without a local transport plan compliant with the European SUMP Guidelines

- Compliance of planning process with the principles of the European SUMP Guidelines:
  - Low Compliance
  - Medium Compliance
  - High Compliance

- Consideration of TEN-T network aspects in the SUMP (or eq. plan):
  - Cities with consideration of TEN-T network aspects in the SUMP (or equivalent plan)
  - Cities without consideration of TEN-T network aspects in the SUMP (or equivalent plan)

- Presence of SMART targets and sustainable indicators for monitoring in the SUMP (or eq. plan):
  - Cities that work with SMART targets
  - Cities that work without SMART targets

- Presence of SMART targets and sustainable indicators for monitoring in the SUMP (or eq. plan):
  - Cities that defined sustainable indicators for monitoring
  - Cities that didn’t define sustainable indicators for monitoring

- Consideration of the functional urban area (FUA) in the SUMP (or eq. plan):
  - Cities with a SUMP considering both the TEN-T network and the functional urban area
  - Cities without a SUMP considering both the TEN-T network and the functional urban area
  - Cities with a SUMP considering the functional urban area
  - Cities without a SUMP (or equivalent plan) in place considering the functional urban area
The description of the main findings for SUMP, are provided below.

**Presence and types of transport plan documents**

Through the collection of available transport planning documents for the cities of the study, a transport plan database was built up and made available to all domain managers and country managers. This includes all types of strategic planning documents for transport and mobility, also considering action plans, strategies and similar documents. The assessment on the presence and types of transport plans are based on a thorough analysis of the plans themselves, combined with data and results from the SUMP self-assessment.

A **transport or mobility plan is present** when the plan clearly issues transport/mobility planning, which can be identified as a stand-alone transport plan and is clearly related to the dedicated city. Data on the presence of transport or mobility plans was collected for all 125 cities of the study. Of 125 cities, 91% have a transport or mobility plan in place and 45% of the cities that do not currently have a transport plan are planning to develop one or are already in the process. For 55% this information is unknown. All large metropolitan and medium-sized urban areas have a local transport or mobility plan. 95% of the metropolitan areas and 83% of the smaller urban areas have a...
local transport or mobility plan. This shows that smaller cities are less likely to have a plan in place. All cities of Belgium, Bulgaria, Cyprus, Finland, France, Ireland, Sweden, Slovenia, Czech Republic*, Denmark*, Spain*, Hungary*, Latvia*, Netherlands*, Poland*, Romania*, Slovakia* and the United Kingdom* that provided data have a transport or mobility plan in place.10

For 90 cities the **correspondence to the European SUMP Guidelines** could be analysed. Of these 90 identified planning processes, 73% are somewhat compliant with the European SUMP principles, while 27% of the processes were not compliant. The correspondence was analysed through the results of the SUMP self-assessment tool combined with an analysis of the transport plan documents. The documents identified do not necessarily need to be called a “SUMP” for having certain aspects included and principles followed. Transport plans following national concepts were also considered, such as VEPs (Germany), PUMS (Italy), PMUS (Spain), VPU or PDU (France). The results show that the on-going strategic planning processes in the cities are diverse, but often compliant with SUMP, even if the document isn't clearly stated as a SUMP or equivalent document. 74% of the identified plans are from the older planning generation, before the year 2015. 91% of large metropolitan areas, 63% of metropolitan areas and 79% of medium-size urban areas that provided data present a SUMP or equivalent plan in place corresponding to the SUMP Guidelines. 70% of the small urban areas that provided data, however, present a SUMP or equivalent plan that corresponding to the SUMP Guidelines.

Regarding the **scope of the analysed transport planning documents**, the analysis was conducted through a combination of answers in the SUMP self-assessment survey and a validation by the domain manager through an analysis of the documents. The Functional Urban Area (FUA) and the Region/Metropolitan area are differentiated through the commuter flows, which should be covered in a FUA. The Region/Metropolitan Area usually goes beyond that. The results are to be interpreted carefully, as city boundaries, FUA and regions have different meanings in European countries. There are redundancies between definitions across Europe.

Concerning the scope of the analysed transport planning documents, data was collected for 111 cities, from which 59% plan for the city, 22% cover the FUA and 20% the region or metropolitan area. This also aligns with the city sample and the respective sizes of the cities. A SUMP covering city administrative boundaries is most common in large metropolitan areas (36%). A SUMP covering the region/metropolitan area is most common in small urban areas. A SUMP covering the Functional Urban Area is most common in medium-size urban areas (40%). Romania and Bulgaria are the countries with the most cities having a SUMP that covers their regional or metropolitan area. France and the United Kingdom are the countries with the most cities having a SUMP that covers their Functional Urban Area. Belgium, Germany, Denmark, Finland, the Netherlands, Poland, Portugal, Sweden and Slovenia are the countries with the most cities having a SUMP that covers their city administrative boundaries.

A more in-depth analysis of the plans for considering the functional urban area showed that from a total of 103 cities only 42% of cities with a SUMP (or equivalent plan) in place consider the functional urban area for their planning scope. This analysis is based on the results of the SUMP self-assessment. Distributed by city size and TEN-T network role, the results show that smaller cities and non-TEN-T cities are likely to not consider the FUA. Overall, most large metropolitan areas (53%) and metropolitan areas (56%) have a SUMP that considers the wider functional area, while 41% of medium-size urban areas and only 33% of small-urban areas do. Cities in Bulgaria, Greece, France and Romania are more likely to consider the FUA as their planning scope, compared to the other countries. The results are to be interpreted carefully as for the same reasons explained above.

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10 *Countries with missing data on one or more cities*
Compliance with European SUMP principles

The compliance of the strategic planning processes in the cities was analysed through the results of the SUMP self-assessment tool. It needs to be noted that the planning process is considered, and not only the SUMP, as the SUMP self-assessment was also filled in by cities with no planning document or SUMP in place. Therefore, it was possible to take up the analysis of their general strategic planning process for urban mobility into the dataset. Furthermore, the SUMP as a document itself is to be seen as one part of the overall planning process, but not as the only outcome or indicator for strategic mobility planning\textsuperscript{11}.

The compliance of the planning process with the European SUMP principles was analysed for 88 cities. On average, the strategic planning processes in the cities reached an overall compliance of 60\% with the European SUMP principles\textsuperscript{12}. This positive result shows a trend for high-quality planning processes which are in line with the SUMP concept. Also, the different principles reveal strengths and weaknesses in the processes and help to identify where cities need further support and guidance. In further detail, 42\% of the SUMPs identified are highly compliant with the SUMP principles. Respectively 49\% and 9\% of the SUMP identified showed a medium and low compliance. Large metropolitan areas (68\%) tend to have a higher level of compliance of SUMP with EU SUMP Guidelines than smaller urban areas (56\%). Cities with a SUMP in Austria, Belgium, Bulgaria, Germany, Finland, France, Ireland, Hungary, Italy, Lithuania, Latvia, Netherlands, Romania, Sweden, and Slovenia show an overall high or medium compliance with principles of the European SUMP concept. Overall, the second-generation plans (63\%) tend to be slightly more compliant with the EU SUMP concept than first generations (60\%). With regard to the TEN-T network role, cities that are urban nodes are compliant in 65\% of the cases, cities that are part of the comprehensive network show compliance in 58\% of the cases and core cities 53\%. Cities outside the TEN-T network are compliant in 60\% of the studied cases.

The SUMP self-assessment results reveal the compliance of the planning processes on the level of the seven SUMP principles. The eight’s principle of assuring quality isn’t covered through the Self-Assessment tool.

Plan for sustainable mobility in the entire ‘functional city’

Cities are connected with their surroundings by daily flows of people and goods, meaning the geographical scope of a SUMP needs to be based on this “functional urban area”. It is based on population density and travel to-work flows and aims to capture the entire commuting area. Depending on the local context, this might be a city and its surrounding peri-urban area, an entire polycentric region, or another constellation of municipalities. The SUMP self-assessment tool evaluates if a city is considering the FUA, based on a range of different questions.

Consideration of FUA in the planning scope

According to the results of the SUMP self-assessment, only 42\% of cities in the study consider the FUA for their planning scope. This result is way below the overall average result of 60\% of all principles and in comparison, to the results of the other SUMP principles. This is also in line with a range of qualitative comments received from different cities, that were all dealing with the difficulty of the concept of the functional urban area. Some cities state that they cannot apply the concept of a FUA for their city and that a FUA for them basically does not exist. Others state that they work with

\textsuperscript{11} Please note that the results are to be interpreted carefully as the SUMP self-assessment tool is a subjective appraisal of the planning structures in a certain city.

neighbouring authorities, but do not target their mobility planning explicitly beyond city boundaries. This is also confirmed in the Self-Assessment data: while many cities do not consider the FUA as planning scope, they still collaborate with neighbouring cities and authorities located in the wider city area. This is a crucial step in strategic mobility planning and represents the scope that needs to be planned for. These results also agree with the analysis of the scope of the plans, which showed that most cities only plan for the city, and not for the FUA or the region.

Cooperate across institutional boundaries
The second principle deals with cooperation and integration with other policies and plans, collaboration with relevant authorities and other levels of government as well as coordination with public and private sector providers of transport services. The cities in the study reached an overall result of 69% in this principle. The results show that cities often collaborate with neighbouring authorities, despite the lack of consideration of the FUA. The positive results of this principle are also in line with the analysis of consideration of other policies and plans in the transport plans.

Involve citizens and stakeholders
A SUMP should follow a transparent and participatory approach, actively involving citizens and other stakeholders throughout the plan’s development and implementation. The cities in the study reached an overall average result of 64% for involving citizens and stakeholders into the process. The participation processes therefore seem to be fairly good, but there is still room for improvement.

Assess current and future performance
The cities in the study reached an overall average result of 75% for assessing the current and future performance in the context of a SUMP process. This shows that only 25% of cities don’t consider this principle in their strategic planning. This SUMP principle represents a comprehensive review of the existing situation and establishes a baseline against which progress can be measured. It also includes a review of current capacities and resources and of the institutional set-up for planning and implementation. This result of the principle assessment shows that the cities seem to have good structures for setting up the planning processes, and also analysing the situation.

Define a long-term vision and a clear implementation plan
This principle covers the establishment of a long-term vision for the FUA and all transport modes, as well as a clear action plan for the short-term implementation of objectives and targets. The total average of 62% represents a positive result, but also room for improvement for some cities.

Develop all transport modes in an integrated manner
A Sustainable Urban Mobility Plan fosters balanced and integrated development of all relevant transport modes while prioritising sustainable mobility solutions. The cities in the study reached an overall average result of 63% for developing all transport modes in an integrated manner.

Arrange for monitoring and evaluation
The progress towards the objectives and targets of the process are monitored through a structured monitoring scheme, based on defined sustainable indicators. In average, the cities scored a total of 66% for their monitoring and evaluation schemes. This is also in line with the analysis of transport plans regarding monitoring schemes and indicators (see quality of planning documents below). In this context, gaps of monitoring schemes could be identified with some cities not having any schemes in place. Further details about monitoring and evaluation will be described in the next chapter.

**Box 22. Best practice - Monitoring and evaluation**

<table>
<thead>
<tr>
<th>Best Practice: Vitoria-Gasteiz, Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>The city of Vitoria-Gasteiz represents a great example for a <strong>high compliance with the principles of the European SUMP concept</strong>. Vitoria-Gasteiz SUMP scored a compatibility of 83%, if the principle considering the FUA is not part of the result (including FUA the scoring is 71%).</td>
</tr>
<tr>
<td>The Sustainable Mobility and Public Space Plan (SUMPSP), Vitoria-Gasteiz’ SUMP, was designed to promote pedestrianisation through the implementation of the superblock scheme. Together with the superblocks, complementing measures were implemented, such as the improvement of public transport, new traffic lights regulations, improved infrastructures for cyclists and pedestrians, urban freight logistics measures and the redesign and expansion of the regulated paid parking space.</td>
</tr>
<tr>
<td>The strengths of the SUMP are based on the city’s ability to assess current and future performance. It is also very well integrated with its national energy and climate policy as well as its local climate plan.</td>
</tr>
<tr>
<td>The SUMP fosters collaboration across relevant authorities and other levels of government as well as between the public and private sector. Participation is also an important aspect of the plan, with a clear participation plan and strategy for involving citizens and stakeholders. During the implementation phase, communication and awareness campaigns were launched to create a favourable perception towards a new culture of sustainable mobility.</td>
</tr>
<tr>
<td>In addition, the mobility plan details the structured monitoring scheme that the city follows to monitor progress, based on the objectives defined for its strategy and the usage of <strong>88 clearly defined sustainable indicators</strong>. In 2021, these indicators are currently being updated.</td>
</tr>
</tbody>
</table>

**Quality of planning documents**

The quality of the identified planning documents was analysed through a mixed-method approach, combining results and answers from the SUMP self-assessment tool and the analysis of the transport analysis. In this context, TEN-T aspects, the consideration of other policies and plans, the integration of road safety and monitoring schemes were analysed for all plans.

Regarding the integration of TEN-T related topics it needs to be noted that this aspect is not crucial to analyse. Aspects of TEN-T are often considered, maybe even unintentionally, as they concern many different aspects of spatial planning. Therefore, this indicator was analysed through the identification of different aspects in the transport plans, for example TEN-T planning perspectives, or the integration of freight and logistics. Resulting from the analysis, 112 cities were analysed, while 79% of these processes include some kind of TEN-T relevant topics, which is an indicator for the TEN-T relevance of the planning documents. All metropolitan areas have a SUMP that considers the connectivity with the TEN-T network while 93% of large metropolitan areas and 84% of medium-size urban areas do. 65% of small urban areas have a SUMP that integrates aspects of TEN-T. SUMPs from all cities from Bulgaria, Cyprus, Germany, France, Croatia, Hungary, Hungary, Ireland, Italy, Lithuania, Latvia, the Netherlands, Romania, Sweden and the United Kingdom integrate aspects of TEN-T related planning into their planning processes. More second-generation plans integrate TEN-T aspects than first generation plans. Based on the differentiation by TEN-T network relevance, it shows that especially
the urban nodes of the network consider the TEN-T network (91%), followed by core (81%), comprehensive network cities (73%) and non-TEN-T cities (64%).

Besides the scoring of the principle “Cooperate across institutional boundaries” which considers the integration of other policies and plans and the cooperation with other departments and authorities, this was further analysed through the mixed-method approach. Generally, the analysis is based on the integration of other policies into the planning process (for example pedestrian, bicycle and public transport plans, freight and traffic safety strategies, land use, urban development, environment and economic plans), but also the inter-departmental cooperation in a municipality, for example between mobility planning and other departments such as environmental, land use or digitalisation. Data was available on this aspect for 88 cities, from which 95% of cities integrate other relevant policy topics into the document. 58% of cities also fully integrate the topics of energy and climate into the planning process, or at least mention these kinds of policies in their planning document. 63 of the analysed plans showed a clear integration of energy and climate, while 33 only considered them partly, as they were mentioned but not as integrated.

As a focus of the integration of other policies, the topic of road safety was analysed in further depths. This could also be analysed through questions from the SUMP self-assessment considering road safety measures and the analysis of problems in the city and an analysis of the transport plans based on key word searches. The analysis of 113 datasets from the study cities showed that 96% of processes include aspects of road safety planning and policies, for example measures to improve safety of all transport modes. Furthermore, 78% also include road safety aspects with view to vulnerable road users. The majority of cities considers measures to improve safety and security of all transport modes in their planning process. 17% of cities to a very great extent, 36% to a great extent, 34% to a moderate extent and 13% to a small extent. Most of the cities (85%) see road safety as an urban mobility related issue as part of their analysis in the strategic planning process. Distributed in city sizes, the metropolitan area cities all consider road safety aspects.

The quality of planning processes is also defined by a good monitoring and evaluation procedure. Besides the results of the compliance of the SUMPs with the SUMP principles, and specifically the principle “Arrange for monitoring and evaluation”, the set-up of monitoring schemes and the definition of SMART targets and sustainable indicators were analysed further. The SUMP self-assessment tool includes valuable questions on which this analysis was based on. Data about SMART targets was available for 83 cities, about monitoring for 73 cities and regarding sustainable indicators for 71 cities. The final results show that for 81% of the plans, SMART (Specific, Measurable, Achievable, Realistic and Timely) targets could be identified. Furthermore, 80% of plans include some kind of sustainable indicators for monitoring. As types of indicators there are output indicators (e.g. newly built infrastructure), transport activity indicators (e.g. modal split, travel behaviour) and outcome indicators (e.g. on accessibility, liveability, air or noise pollution). On average, the plans included one of these indicator types. Most common are transport activity indicators, followed by outcome indicators and last output indicators. 60% of the cities have a regular monitoring scheme in place, which is usually a systematic, criteria-based assessment process (multi-criteria analysis). Other cities don’t regularly monitor their indicators or follow intuitive decisions with no systematic assessment. In general, second generation SUMP tend to consider more SMART targets and sustainable indicators for monitoring. These results show very clearly that cities are better in setting up for monitoring through defining targets and indicators, and not as good in conducting the monitoring and/or developing a systematic monitoring scheme.
Box 23. Best practice - planning process

Best Practice: Vilnius, Lithuania

The capital of Lithuania, Vilnius, can be considered a beginner city in Sustainable Urban Mobility Planning but can already present a comprehensive and high-quality planning process. The analysis conducted in this study, both through the city’s self-assessment data and its transport plan analysis, has revealed the strengths of its SUMP.

The transport plan highlights the great efforts the city is making to incorporate road safety measures with focus to vulnerable road users. A status analysis of road safety was conducted, which revealed that the city centre is generally perceived as an unsafe area for Vilnius citizens. The plan entails the implementation of improved road infrastructure and facilitates new public transport services. The measures are particularly targeted to pedestrians and cyclists.

Furthermore, the plan also considers the integration of the TEN-T network, multimodality and the integration of freight and logistics. The further development of the infrastructure of the multimodal transport corridor is carried out by integrating Klaipeda State Seaport and public logistics centres in Vilnius, Kaunas and Klaipeda. Overall, the SUMP illustrates Vilnius efforts to link its urban mobility planning within the European and national transport system by considering a scope beyond urban boundaries.

COVID-19 impact

In the context of the current pandemic situation, two additional indicators regarding the impact of COVID-19 on planning, measures and data collection were included in the study. The questions were asked as part of the cross-domain survey and therefore differ from the other data in Domain A.

The results show that from 61 cities only a minority (15%) used the SUMP as a framework for emergency planning. This shows a further need in developing sustainable planning processes towards robustness and resilience of the mobility system. SUMP as a planning framework were mostly used in large metropolitan areas (29%) for providing the framework for COVID-19 emergency action. Fewer of the sampled cities in the metropolitan area (14%), medium-size urban area (11%) and small-urban area (14%) used their SUMP to provide the framework for COVID-19 emergency action planning. Cities in Belgium, Spain, Finland, Portugal, Sweden and the United Kingdoms were the ones to use SUMP as an emergency planning framework.

Furthermore, it was analysed how COVID-19 impacted the implementation of urban mobility measures. From 70 cities, 43% stated that COVID-19 led to a change of priority in the implementation of certain urban mobility measures. The most common measures that were prioritised included the reallocation of space, for example bicycle lanes and new pedestrians’ spaces, either by creating temporary bike lanes or introducing the ones originally planned in their SUMP. Overall, cities focused on soft measures promoting active mobility and non-motorised infrastructures. Bike-sharing was also prioritized through the provision of cheaper bike-sharing passes and creating new bike-sharing stations. In some cities, restrictions on parking spots were prioritized to redistribute these spaces to pedestrians or for outdoor seating for restaurants. Some cities also prioritized monitoring, using COVID-19 temporary solutions has a testing phase which led them to launch several strategic actions accordingly and deliver elements of their SUMP in a quicker timeframe than was originally envisaged. It is not to be analysed from the data available if these measures were completely new, but it is clear that they were at least prioritised as important measures and brought forward in the pandemic situation. In addition, a city highlighted that the COVID-19 restrictions are severely impacting the capacities in the municipality, especially due to working remotely.

As a result of COVID-19, cities have adapted parking instruments (37%), increased the number of cycling facilities (35%), introduced scheme timescales for logistics (11%) and adapted UVAR schemes to the situation (9%). Besides that, 65% of the cities have
implemented other measures. The most common measures implemented as a result of COVID-19 were the implementation of pedestrian zones, cycling zones and low-speed zones but also restricting/increasing public transport capacity and frequency. Also mentioned were the suspension of fines, the reduction of waiting time at intersections for cyclists, the increased hygiene in public transport, restrictions for parking spot usage, etc. Some measures, however, were seen as controversial or counterproductive in the implementation of sustainable urban mobility such as implementing free or reduced parking fees when public transport services were reduced (which led to congestion in downtown).

From 70 cities, 66% collected data on changes in mobility patterns during the pandemic. Some cities continued their efforts in mobility data collection to monitor and evaluate the impact of COVID-19 on mobility and the impact of temporary mobility measures. In certain cities, the data collected was compared and analysed with data from other sources such as traffic light data, TomTom platform, google data, bicycle and walking counter data and data from mobile service providers. Overall, most cities used their existing monitoring systems to collect data and used other data sources to further strengthen their understanding on changes in mobility patterns.

3.4.2. Domain B - Urban Vehicle Access Regulations

Domain B (UVAR – Urban Vehicle Access Regulations schemes) encompasses several types of vehicles restriction schemes, (e.g. Low Emission Zones, congestion charges, pedestrian zones, etc.) responding to several objectives: improving air quality, reducing congestion, ensuring liveability and walkability of cities, etc. For most cases, in one city different types of UVAR may exist, depending on the range of objectives the municipality is aiming to address. Furthermore, the different types of UVAR operating in one city may also differ in terms of size and area of application: for example, a single-stretched 100-metre road, in which only pedestrians and cycling are allowed to enter, may run in parallel with an entire area of 10 square kilometres in which only the least polluting vehicles are allowed to circulate.

In order to cope with this complexity, cities were explicitly asked to provide detailed information on the most important and significant UVAR schemes present in the city, simply mentioning the existence of other, minor types of UVAR, for which data has not been collected. On the other hand, in some larger cities as Rome, Milan, Gothenburg, Paris, London data has been collected on more than one UVAR scheme, due to the importance of the UVAR schemes under examination (e.g. the congestion charge and the Low Emission Zone in Gothenburg).

All in all, data for all 125 have been searched. However, domain expert and country managers have been able to collect UVAR information for 110 out of 125 cities in the UVAR spreadsheet (e.g. type of UVAR, identification of the vehicle characteristics; relation to local transport strategies, etc.). Of the 110 cities, a complete dataset (i.e. all sections of the UVAR spreadsheet have been filled in) is available for 85 cities while for 25 cities, some data gaps remain.

The spreadsheet has been initially pre-filled by the domain expert, with the support of country managers, using data drawn from online sources and literature review. The information has then been validated by city representatives. Overall, the data on UVAR has been validated for 78 cities; the remaining information has been validated as much as possible by country managers, on the basis of desk research, using national data, local reports and statistics.

Furthermore, 23 cities (out of 34 to which the survey was addressed) have completed the request of country managers to also fill in an additional data collection tool, the UVAR mini survey. This survey, which has been filled in directly by city representatives, has allowed us to collect information on a number of additional topics related to UVAR.
schemes of interest to the Commission; this includes the way in which UVAR data is stored (i.e. which data standard) and the link between UVAR and freight logistics.

The dataset allowed us to develop the following indicator sheets for UVAR (available in Annex B):

- UVAR existence;
- UVAR types;
- UVAR imposition;
- UVAR size;
- UVAR boundaries identification;
- UVAR vehicle eligibility criteria;
- UVAR eligibility standard;
- UVAR timeline of application;
- UVAR vehicle identification criteria;
- UVAR interlinkages with policy targets and other strategies;
- UVAR accessibility;
- Existence of UVAR parking for commuters;
- UVAR integration in city plans (SUMP, local air quality plan);
- Plans for future UVAR development;
- UVAR information provision means;
- UVAR treatment of foreign vehicles;
- UVAR enforcement means;
- UVAR monitoring and assessing impacts;
- Covid-19 impacts on UVAR;
- UVAR data;
- UVAR acceptance and effectiveness;
- UVAR and freight;
- New UVAR.

Figure below provides an overview of the results from the data collection on this specific domain. For the complete and detailed version of these indicators, please refer to Annex B.
Figure 14: Overview of results from the data collection on Domain B
The description of the main findings for UVAR, are provided below.

**Types of UVAR**

From the analysis of the study, it appears that UVAR schemes are becoming an important component of urban mobility. The analysis has shown that, of the 125 sampled cities, 88% have an UVAR. The remaining 12%, are mostly small and medium-sized urban areas that have UVAR schemes that have not been considered relevant (e.g. small pedestrian zones). However, even in such cases, it is likely that examples of small pedestrian areas or limited parking schemes are in operation.

In those 88% of cities for which a relevant UVAR was found, the most popular two types of UVAR in operation are Low Emission Zones and pedestrian zones (both present in 31% of analysed UVARs). Traffic restriction schemes, which are found in 18% of analysed UVARs, are mainly applied to freight vehicles, while permit schemes are applied on the basis of vehicle weight, payment of a charge, etc. and are present in 11% of analysed UVARs. 30 Km/h zones are found in 6% of analysed UVARs, mainly in small urban areas, while congestion charge areas exclusively implemented in large metropolitan cities (3% of total number of UVARs analysed).

Information on the size of UVARs has been collected for 93 cities. In 46% of analysed UVARs, this covers an area of less than 1 km². In 20%, the size is between 1km² and 10km² while in 34% of analysed UVARs – mainly implemented in national capitals – the UVAR concerns an area larger than 10 km². In the latter case the prevailing type of UVAR is the Low Emission Zone.

**Enforcement**

Automatic means of enforcement against manual form is one of the most debated issues when implementing UVAR schemes. In principle, enforcement methods through digital tools, such as camera surveillance with ANPR, in addition to facilitating the collection of...
data and the UVAR knowledge base (e.g. information on traffic flows, type of vehicles involved), offer the advantage of sensibly improving the compliance rate.

On the other hand, the effectiveness of digital tools depends on the characteristics of the city, such as size and composition of traffic flows; for example, if the traffic is inward-generated (i.e. with no relevant number of vehicles from abroad) the benefits in using camera and ANPR may be limited. Generally, the advantage of adopting camera control tends to be higher as the number of vehicle types (i.e. their volume and composition) to detect increases.

The study has collected data on the UVAR enforcement means on 109 cities. 66% of analysed UVARs use as an enforcement method a manual traffic control by traffic wardens or the local police department. The digitalisation of enforcement has been implemented only by 26% of UVARs, almost exclusively through Automatic Number Plate Recognition (ANPR).

The decision about which type of enforcement to implement - manual or digital - depends on several factors, including implementation costs, access to databases, type of UVAR scheme, etc. Nevertheless, the progressive transition towards digital instruments of enforcement could improve compliance rates and the knowledge base on UVAR.

**Accessibility**

UVAR accessibility concerns the management of public space, including the provision of alternative transport solutions to access areas restricted to vehicle circulation, and the presence of parking arrangements, for instance, for commuters. This is a sensitive topic, due to the fact that restrictions to vehicle circulation may be perceived as a limit to personal freedom or a threat to the free circulation of goods, undermining the local economic development. In general, it is important for transport planners to balance the limitations to circulation in place, by providing viable alternatives to citizens.

Information on UVAR accessibility has been collected for 101 cities. 25% UVARs are accessible only by cycling and walking, while 57% are also served by public transport. In 18% of UVARs, "other vehicles", such as electric vehicles, are able to access UVAR.

**Exemptions**

The type and number of exemptions should find a compromise between two principles; 1) the more exemptions are allowed, the less effective the UVAR scheme is going to be. It is important, indeed, that the proportion of vehicles exempted from the restrictions is limited, in order to avoid reducing the UVAR scheme’s effectiveness; 2) on the other hand, it is also important that the application of UVAR considers the local conditions, for example, the composition of local businesses and of the resident population.

The most common types of vehicles exempted are emergency response vehicles, military vehicles, veteran vehicles, and vehicles used for the transport of people with disabilities or driven by disabled people themselves. However, cities may include other types of exemptions as well, for example, for low income families and/or business or for vehicles destined for markets and fairs.

The evidence of the study shows that the number of “other exemptions” is by far not negligible: taking into consideration Low Emission Zones and Congestion charges (as these are the types of UVAR schemes for which the types and number of exemptions are recurrent) 39% of UVARs apply a number and / or composition of exemptions exceeding the normal or standard types of exemptions. The cities exhibiting more diversified types of exemptions are in general big cities. For example, citizens resident in Central Madrid, either just because they are resident, or because they have a garage space or carry out any professional activity as a company or self-employed person, may have freely available authorizations in the Low Emission Zone.
The full list of the other types of exemptions, aside from the most common ones, that the study has identified, are as follows:

Driving to school;
Removal companies;
Authorized market suppliers;
Transporting frozen goods and fuelling vehicle;
Vehicles with a parking card for people with disabilities;
Social workers and nurses;
Doctor’s visit;
Journeys of commuters to their place of work if no public transport is available at the start and end of working hours;
Supplying essential goods, supply and disposal of construction sites, special motor vehicles with a special business idea, special vehicles with high acquisition costs, showmen;
Special cases of hardship (e.g. Threat to existence of a trader), bus and application camper van for residents;
Resident’s vehicles, private car park owners, public utilities, hotel guests, vehicles owned by shops or companies inside the ZTL, delivery goods, car sharing, home care, night-time surveillance, artisans, funeral company, voluntary organizations;
Residents with a garage space or carry out any professional activity as a company or self-employed person, have freely available authorizations;
Wheelchair-accessible private hire vehicles (PHVs).

The treatment of foreign vehicles

UVAR measures affect not only local citizens but are also of certain interest and relevance for tourists and road users coming from beyond the UVAR area and national borders. The fast-growing international mobility of people and vehicles makes this aspect particularly relevant. Tourists and business travellers are specific categories that need to be informed of UVAR schemes, overcoming language barriers. Other representatives as travel agencies and long-distance coach services also have to be able to learn of local vehicles access regulations in place. When UVAR measures affect foreign vehicles, cities have to cater for these specific groups.

Overall, the 85 cities for which this information was collected for the study, allowed us to determine that the treatment of foreign vehicles varies considerably between cities. Hence, there is not a single, definite framework for the regulation of UVAR access for foreign vehicles. 43% of these UVARs in fact, require foreign drivers to either register their vehicles on a website, fill-in an on-line form or contact a municipal office. Instead, 40% of UVARs inform foreign drivers about UVAR measures only through road signs. For the remaining 17% of UVARs, there is either not regulative framework (13%) or foreign vehicles are not affected (4%) by the scheme.

The automatization and digitalisation of foreign vehicles’ detection can improve not only the enforcement of UVAR schemes but also provide for a simpler and fairer access to foreign vehicles when compiling with local emissions limitations. The Flemish regional government for example, has been able to carry out the harmonisation of international vehicle databases (please refer to Box 20 for further details). The Flemish system could be applied across all countries, allowing to standardise the European procedure to treat foreign vehicles and to harmonise also other UVAR aspects (e.g. vehicle eligibility standards).
Box 24. Best practice - treatment of foreign vehicles

The Flemish system to treat foreign vehicles

The Flemish government has undertaken an initiative to allow Dutch fleets automatically in its UVAR areas.

The process has been implemented by involving several local, regional and federal partners, including the Ministry of Mobility, the Ministry of the Interior and the Ministry of the Economy. The legislative framework was promoted at the federal level (Royal and ministerial decisions of 21/7/2014) and promulgated by the regional government (Decree 27/11/2015). The Flemish legislation defines the types of vehicles that have permission to enter the restriction zone, for which local authorities can be less strict and also provides the database of permitted vehicles, including Dutch fleets. Local administrations enforce LEZ by providing paid access or collecting fines from vehicles not permitted by Flemish regulation.

The Maximum Data Sharing between Agencies (MAGDA) platform integrates national vehicle databases with municipal systems: LEZ-database, local admission whitelist, city check & registration tool, etc. MAGDA allows administrations to deal with and fluent processing citizens and companies’ demands to enter Low Emission Zones. The access to federal databases allows the Flemish web services integrator to check information on permit demands, technical information on vehicles, and the name and address of offenders in order to read and filter permitted number plates automatically and send administrative fines and collect payments directly. Moreover, MAGDA allows the environmental department to store a comprehensive set of information to monitor LEZ effects, including those on citizens’ health and socially weaker groups. The platform exchanges information of different databases between different entities, according to privacy regulation, and provides the highest degree of integration and automation in Europe. It is possible to query more than one national vehicle database and change the platform use (e.g., for congestion charging, traffic management) since MAGDA components are reusable. Finally, the application code is transferable to other cities and regions and it is designed to deal with future changes in access criteria.

This system has been successfully implemented in Antwerp first, then in the Brussel region, Ghent and Mechelen. It has an extremely high potential degree of integration and automation for the entire Europe, enabling sophisticated monitoring of UVAR effectiveness and environmental impacts. It is worth noting that this best practice of foreign vehicle treatment is not limited to developing a platform that integrates different databases and interfaces but includes the possibility of post-register foreign vehicles for those who accidentally enter the UVAR zone and also includes an extensive communication campaign not only focused on the local population.

Alignment with local transport strategies

Information on the alignment of UVAR with SUMP and local air quality plans has been collected for 103 cities.

The results of the study on this aspect provides a complex picture: on the one hand, the relation to local transport strategies (SUMP and/or air quality plans) seems to be good: cities reported that their SUMP includes UVAR measures in 67% of UVARs, while in 57% of cases that UVARs were correlated to a local air quality plan. However, the claimed link to the SUMP or local air quality plans does not necessarily imply the strategic inclusion of UVAR schemes in long-term plans. At times, the link to air quality plans may only refer to the monitoring of key pollutants and may not imply the existence of a strategic local air quality plan, for example, the definition of long-term air quality targets and strategies, as in the Action Plan for Urban Mobility in Copenhagen or in the city of Amsterdam 2030 Clean Air Action Plan (please refer to Box 21 for further information).

13 https://urbandevelopmentcph.kk.dk
In short, if there are positive signals about the majority of the cities linking the UVAR schemes to strategic plans, the collected data do not allow for an evaluation of the quality of this link.

**Plans for future developments**

Data on plans for future developments of UVARs has been collected on 99 cities. Only 24% of the cities do not have any future plans for the further development of their UVARs. 37% of cities will implement stricter measures in the next few years, 23% will increase their UVAR area while 8% will do both.

An interesting aspect to focus on is the type of innovation at stake. Those cities that are planning to develop new types of UVAR in the future (17%), they are moving towards decisive decarbonisation plans, which will involve car-free cities and pedestrian areas. Box 21 presents a best practice on the city of Amsterdam 2030 Clean Air Action Plan.

**Box 25. Best practice - Plans for UVARs**

[Table]

<table>
<thead>
<tr>
<th>Amsterdam 2030 Clean Air Action Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>The city of Amsterdam aims to meet the World Health Organization’s air quality guidelines by 2030 onwards. The Clean Air Action Plan sets out the city’s approach to expand the six Low Emission Zone and tighten the regulations. Increasingly they will become zero-emission zones, where no petrol, diesel or gas vehicles are allowed. The most important milestones will be:</td>
</tr>
<tr>
<td>From 2020, diesel cars with emissions standard 0,1,2 or 3 engines will no longer be allowed within the A10 ring road;</td>
</tr>
<tr>
<td>From 2022, traffic of goods will only be allowed within the A10 ring road with a zero-emission or emissions standard 6 diesel or petrol engine;</td>
</tr>
<tr>
<td>From 2025, only electric scooters and mopeds will be allowed in the built-up area of Amsterdam. Goods and delivery vehicles, taxis, public transport buses and private coaches will only be allowed inside the A10 ring road if they have zero-emission engines. The same goes for passenger and pleasure vessels and public transport ferries;</td>
</tr>
<tr>
<td>From 2030, the entire built-up area of Amsterdam will be emission-free for all forms of transport, including cars and motorbikes</td>
</tr>
</tbody>
</table>

**Monitoring & Evaluation**

Of the 101 cities for which data has been collected, 37% declared they do not monitor and assess UVAR impacts. Data also indicates a lack of monitoring indicators such as UVAR quality of life and acceptability among citizens and stakeholders. 50% of UVARs monitor and assess urban emissions, mainly CO\textsubscript{2}, NO\textsubscript{2}, PM\textsubscript{10} and PM\textsubscript{2.5}.

This lack of monitoring and assessment of the acceptability and effectiveness of UVAR schemes may undermine the effective communication of the rationale behind restriction schemes. In particular, the regular communication of UVAR impacts the environment.

Good practices addressing this topic may be found. The box below summarises the city of London’s approach for the impact assessment of the city of London’s “Ultra Low Emission Zone”.

**Box 26. Best practice - Monitoring and evaluation**

[Table]

<table>
<thead>
<tr>
<th>The city of London – Ultra Low Emission Zone evaluation report</th>
</tr>
</thead>
<tbody>
<tr>
<td>On 8 April 2019 the Mayor of London launched the Ultra-Low Emission Zone (ULEZ). Six months on, data indicates the scheme is having a significant impact – although further</td>
</tr>
</tbody>
</table>
analysis will be needed to fully assess the long-term impacts. The impact of ULEZ is assessed using a number of different metrics including: Air quality monitoring; Modelling of vehicle emissions; Number of vehicles and compliance rates; Traffic flow data area of Amsterdam will be emission-free for all forms of transport, including cars and motorbikes. Further analysis is ongoing in order to understand the impacts of ULEZ including trends in changes in compliance, traffic flows, and air quality.

Concerning the acceptability of UVAR schemes, a good practice comes from the city of Aberdeen which, in preparation for the upcoming implementation of a Low Emission Zone, is undertaking an extensive citizens’ consultation and stakeholder engagement process, setting the scene for a better acceptability of the LEZ.

**Box 27. Best practice - Monitoring and evaluation**

| The City of Aberdeen consultation process |

In accordance with the Scottish Government’s Programme for Government, Aberdeen City Council is looking at options for a Low Emission Zone in Aberdeen. Currently, 8 options have been identified for public and stakeholder consultation and detailed traffic and air quality modelling. Public and stakeholder engagement on the options took place during September and October 2020 and the findings of this are currently being analysed.

The outcomes of this engagement exercise will be combined with the findings of the modelling work to help determine a preferred option for a LEZ in Aberdeen.

The Interim Stage 2 Low Emission Framework Summary Report (a report on the option appraisal process to date) can be downloaded from the Municipality web page. A Non-Technical Summary Report, showing the various LEZ options under consideration, can also be available.

Another example is the Mobility plan Ghent 2030, in which the ambitious long-term plan aiming to create a city that is both liveable and accessible is supported by the collaboration with the key traffic generators (schools, businesses, public events), involving stakeholders in the definition of policies and raising the acceptability of mobility management.

**Box 28. Best practice - Monitoring and evaluation**

| The City of Ghent Mobility Plan 2030 |

The city of Ghent has designed a new Mobility Plan\(^\text{14}\) - the city’s strategic mobility vision - comprising, in 2016, a parking plan and, in 2017, a circulation plan and other initiatives designed to restrict access to the city centre for non-essential traffic.

As a strategic plan, the Ghent Mobility Plan 2030 addresses various questions and challenges, e.g. less traffic pressure, more active modes, more attractive environment to live, work or study in.

The Circulation Plan and Parking Plan are two important parts of the Mobility Plan 2030:

\(^{14}\) Source - City of Ghent Urban Mobility Plan 2030
The Circulation Plan prevents transit traffic from entering the city centre. This way, pedestrians, cyclists, buses and trams will get more space and drivers who really need to be in the city can easily reach their destination;

The Parking Plan includes measures to deal efficiently and wisely with the available parking spaces, including the increase in areas reserved for resident parking and the division of street parking spaces on streets in four zones.

What is relevant is the way in which the Mobility Plan has been designed: the city council has made some decisions ensuring that both citizens and visitors will get more space.

The circulation plan was designed by the city, and then discussed with citizens. The residents of the neighbourhoods concerned were invited to provide feedback. Ghent reported that it learned that residents were involved at too late a stage, when they could no longer influence the design of the plan. In 2020, Ghent revised the consultation process for the preparation of mobility plans for the city’s suburbs. In the revised process, residents were interviewed and invited to share their ideas on mobility in their neighbourhood at the start of the process. The COVID-19 crisis forced the city to organise online interactive webinars, nonetheless, residents provided significant feedback.

**Data storage**

Information on data storage has been collected on 23 cities through the UVAR mini survey (out of 34 to which the survey was addressed). The rationale of the survey was to provide feedback on the standard used when collecting UVAR-related data. The delegated regulation (EU) 2015/962, which integrates the ITS directive, states that road transport data collected by local and national authorities (national access points) must be harmonized in order to facilitate its use in info-mobility services.

In particular, the survey aimed at verifying to which extent municipalities share UVAR data with National Access Points and cooperate with the Single Digital Gateway (SDG), in line with the ITS Directive and its Delegated Regulation 2015/962.

The evidence indicates that most of the cities are not complying with the ITS Directive: only 24% of cities use the dynamic data (DATEX) standard for data storage and only 10% cooperate with the Single Digital Gateway (SDG). 31% share data with the National Access Point (NAP).

**UVAR and freight**

The survey has also addressed the relationship between UVAR and logistics. This data has also been collected on 23 cities (out of 34 to which the UVAR mini survey was addressed to). Regarding the types of measures envisaged in the UVAR schemes, 26% of cities include specific routing for logistics vehicles, 13% use load factors indicators and 39% have specific time windows for logistic vehicles (e.g. regulating the access to pedestrian zones).

The tools used to enforce and inform logistic vehicles about the UVAR schemes consist in signs, Automatic enforcement (ANPR), municipal staff or police enforcement and online tools. The use of manual enforcement is more common: signs represent 52% of the total answers (cities could select one or more tools) while municipal staff or police enforcement represents 48%. Instead online tools and ANPR enforcement, which are less in use, correspond respectively to 34% and 26% of the total answers.

### 3.4.3. Domain C – Sustainable Urban Logistics Planning

This section investigates how cities promote the development of a sustainable urban freight system, the progress that is made towards achieving CO₂-free city logistics and the challenges they face.

All publicly available SUMPs, SULPs, urban logistics policy documents and action plans on logistics were collected and analysed by the domain expert and country managers for all
125 cities. City representatives were then asked to validate the pre-filled data and complete the survey’s section on SULP. Of the 125 cities, **65 validated and completed the cross-domain survey**.

The remaining cities, which did not validate the data, have been covered by country managers, fully or partially, via desk research, researching information in local language via the publicly available information on the city’s mobility plans and policy actions on urban logistics.

The dataset allowed us to develop the following indicator sheets for SULP (available in Annex C):

- Existence of local transport plan with attention to urban logistics;
- Awareness of the concept of SULP (European guidelines);
- Specific expertise in place on urban logistics;
- Extent to which urban logistics plan considers the connectivity with the TEN-T network;
- Extent to which urban logistics plan considers the wider functional urban area;
- Coherence of the urban logistics plan with strategic thematic plans;
- Data collection on urban logistics;
- Barriers for data collection on urban logistics;
- Definition of evaluation frameworks and measurable targets/indicators;
- Extent to which the urban logistics plan contains certain elements;
- Means by which freight externalities are tackled.

The figure below provides an overview of the results from the data collection on this specific domain. For the complete and detailed version of these indicators, please refer to Annex C.

**Figure 15: Overview of results from the data collection on Domain C**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existence of local transport plan with attention to urban logistics</td>
<td>Cities with a local transport plan and a separate urban logistic plan, Cities with a local transport plan where logistic elements are somehow mentioned in the mobility planning document (SULP), Cities without a local transport plan</td>
</tr>
<tr>
<td>Awareness of the concept of SULP (European guidelines)</td>
<td>Awareness of SULP in cities, No awareness of SULP in cities</td>
</tr>
<tr>
<td>Specific expertise in place on urban logistics</td>
<td>Support by local government, No support by local government</td>
</tr>
<tr>
<td></td>
<td>Support by appointed professionals, No support by appointed professionals</td>
</tr>
</tbody>
</table>
The description of the main findings for Sustainable Urban Logistics Planning, are provided below.

**SULP awareness**

This information has been collected for 85 cities. Of these cities, only 68% are aware of the European guidelines on SULP. This may be due to the fact that the SULP concept is not widely known or applied throughout Member States. This should not surprise, since SULP is a relatively new concept and is not embedded in policy making yet, in contrast to the well-established SUMP.
**Existence of local transport plan with attention to urban logistics**

Data on this topic has been collected for 107 cities. Of these cities, 58% pay somehow attention to logistics (i.e. the word freight or logistics is mentioned at least once in their mobility plan), 13% have a separate Urban Logistics Plan, while 29% do not have a separate plan nor are the words freight and logistics mentioned in their mobility plans.

It can be concluded that the SULP, whether it is a planning process, an action plan, a mobility planning document which mentions logistics or a separate planning document, has been found only in a limited number of cities. Apparently, providing guidance on the subject (e.g. via guidance documents on SULPs, or via pilot projects or knowledge-sharing studies like CIVITAS) has not proven sufficient. It seems that putting into practice this guidance and building knowledge on urban freight policymaking is not an easy task; lastly, the lower priority given to urban logistics in Member States’ political debating, leads also to not adequate financial support for the development of SULPs.

Please note, the analysis presented in the following sections are provided with regards to the cities that present some attention to logistics in their urban planning documents.

**SULP design and implementation support by local government and or appointed professionals**

This question of the survey received a total of 60 answers from cities (31 additional cities skipped this question as it was not applicable to cities without a plan in place with attention to urban logistics). Of the 60 cities, 88% declared having received support by local government when designing and implementing their plan while 68% had the support of appointed professionals.

It is more common for large metropolitan cities to appoint professionals for the development of their sustainable urban mobility plans, than small urban areas. The same applies for support from the local government.

Starting a logistics planning process seems to be a common challenge and it has proven to be even more difficult taking up logistics elements in a SUMP or drafting a separate SULP. The problem is evident when it comes to the specific challenges of drafting SULPs, where the lack of data on the current challenges, impacts, and ambitions for urban logistics as well as the limited experience and knowledge of municipal staff of developing, applying and monitoring logistics policies represent a major issue.

Many cities, although have the local knowledge for policy making on mobility and logistics, struggle to get a solid understanding of logistics activities at the global, national and regional level. City representatives and logistics companies arrange their policies and activities on different regional scales. City representatives could, therefore, opt for a regional or national logistics policy approach, as it could help city representatives to develop impactful logistics policies, either in regional plans or via a local SULP. The study revealed that smaller cities are the ones that are already co-operating at the regional level (e.g. The Netherlands, Vienna and Brussels region). A poly-centric approach can support cities collaborating regionally, to share knowledge and tackle urban logistics challenges jointly.

**Extent to which the urban logistics plan considers the connectivity with the TEN-T**

This question of the survey received a total of 62 answers from cities (31 additional cities skipped this question as it was not applicable to cities without a plan in place with attention to urban logistics). Of the 62 cities, only 16% consider the wider functional urban area to a full extent, while remaining consider it partially (42%) or not consider it at all (42%). Generally, large metropolitan areas pay more attention to this aspect in comparison to small and medium-sized urban areas.
Extent to which the urban logistics plan considers the connectivity with the wider Functional Area

This question of the survey received a total of 61 answers from cities (31 additional cities skipped this question as it was not applicable to cities without a plan in place with attention to urban logistics). Of the 61 cities, only 31% consider the wider functional urban area fully while 52% consider it partially and 16% do not consider it at all.

Coherence of the urban logistics plan with strategic thematic plans

The 88 logistics plans of the cities part of the study sample – this includes both separate plans and logistics elements integrated in mobility plans – are in most cases aligned with other strategic thematic plans: mobility, climate/energy and spatial planning are included respectively in 64%, 50% and 45% of cities’ plans, while congestion, safety and noise are less present in plans, respectively in 38%, 32% and 32%. Value capturing is the least considered topic, with only 17% of plans including this. It is worth noting that in general, large metropolitan cities consider other strategic thematic plans more than smaller urban areas.

Data collection on urban logistics

This information is available for 82 cities from the study sample. Of these, only 29% have confirmed that they collect data on urban logistics while the majority, 71%, do not.

In fact, data collection on urban logistics appears to be a real challenge for cities. As urban logistics has been given a lower priority, there is a lack of funding for the collection of data on such topics; without the availability of a large and reliable dataset though, it is hard to define the challenges, gaps and needs in policy making. Other barriers for data collection on this are the lack of knowledge on the best methods for data collection, the lack of cooperation with stakeholders in possession of data on urban logistics, and the technical challenges of collecting data.

Possible solutions for this may be: to increase the funding for local mobility departments to request external advice on the collection of urban logistics data, to provide a National Framework on data collection, organising cities in poly-centric constellations (this is especially true for smaller cities) and to provide guidance on data collection tools, monitoring frameworks and lastly, to promote the objectives of the White Paper and European Sustainable and Smart Mobility Strategy.

Barriers for data collection on urban logistics

This information has been collected for 63 cities. Of these, 52% selected methodological barriers as an obstacle to the collection of data on urban logistics, 48% the lack of cooperation from logistics companies and 40% financial barriers.

A lack of cooperation with private actors in the logistics sector can be a large obstacle for cities intending to collect data on urban logistics. Also, the lack of knowledge and/or resources in city administrations can be a challenge for many cities, especially for smaller ones.

Definition of evaluation frameworks and measurable targets/indicators

This information has been collected for 82 cities. Of these, only 32% have defined an evaluation framework, 36% have defined measurable targets and 27% have defined measurable indicators. This demonstrates that both evaluation frameworks and measurable targets and indicators are only defined in a small minority of cities, mostly in larger metropolitan areas.

Only a minority of the cities in the study sample have set concrete and measurable targets in order to reach the White Paper and Sustainable and Smart Mobility Strategy’s
objectives on urban logistics activities. As previously stated in fact, only some cities have a separate logistics plan or have integrated logistics elements in their general policy plans, or SUMP. This although the cities that have a logistics plan, whether this is integrated in a mobility plan or separate, normally include the abovementioned objectives in order to reach zero-emission transport in the future. At the same time however, this aim is not clearly set or supported by measures or a measurement framework.

**Means by which freight externalities are tackled**

Information on the means through which freight externalities are tackled has been collected for 83 cities. Of these, 51% tackle these through a general planning document at city level, 27% through a general planning document at regional or national level, 16% through a SULP, 23% through direct measures and another 23% through other means (e.g. through climate policies). 16% of cities instead, do not currently tackle freight externalities. Externalities are tackled mainly via the implementation of UVARs which – through the introduction of emission criteria (often based on EURO norms) – lead to lower emissions in the zones. Noise and congestion in urban areas are tackled only indirectly, by encouraging, for example, cargo bike deliveries, mobile lockers and off-peak transport.

**Box 29. Best practice - SULP**

<table>
<thead>
<tr>
<th>Good practice in the Netherlands</th>
</tr>
</thead>
</table>
| In the Netherlands, the number of detailed urban logistics plans is rather limited. At the same time many cities have set objectives for making urban areas more sustainable and liveable via general planning documents, or via a mobility plan where attention is given to urban logistics activities. Also, the tradition of bottom-up and voluntary collaboration approaches in the Netherlands have resulted in cooperation mechanisms on logistics between the Ministry, provinces and private stakeholders (as shown in the project Vital Nodes as a good practice) as well as between regional and poly-centric policy makers via the GMNI (i.e. network platform of municipalities).

The Netherlands have developed a national approach for pursuing the White Paper objective of CO₂-free city logistics by 2030 which consists in setting objectives for the largest 30-40 cities and offering financial support for the implementation of plans aiming at reaching this objective. In this regard, there are two key elements: Green Deal ZES and SPES.

**Green Deal ZES**

At the end of 2014, various parties signed the Green Deal on Zero Emission City Logistics (ZES). The goal of the Green Deal ZES is to arrange city logistics to be as emission-free as possible by 2025. Signatories include the government (municipalities, Ministry of Infrastructure and Water Management, Ministry of Economic Affairs), transporters, shippers, car manufacturers, research institutes and sector and interest groups.

From 2025, municipalities will have the option of setting up a separate Zero Emission zone. Only zero-emission trucks and vans will be allowed to enter this zone. Also, the zero-emission zone will have to include the city centre and the surrounding neighbourhoods.

The Urban Logistics Implementation Agenda, including the Dutch 'Climate Agreement', was signed on February the 9th 2021. This is a framework created for the implementation of the Green Deal ZES. All Dutch cities will follow this framework, avoiding misalignments between cities in the same region.

The figure below, shows the timeline of the various steps of the Green Deal ZES.

**Figure 16. Steps in Green Deal ZES**
SPES

The Ministry provides support to cities for the implementation of changes concerning city logistics through SPES. SPES is a project-based temporary organisation, which engages with academics and consultants in the field of logistics. With access to experts in logistics, zero-emission techniques, legal services, process support and research, SPES helps prepare and guide municipal decision-making. Municipalities can also receive financial support from SPES towards the introduction of a zero-emission zone, even though its main value lies in the knowledge it can provide.

SPES has developed a step-by-step plan for municipalities towards the successful introduction of a zero-emission zone. The step-by-step implementation plan has been carefully designed in such a way for the implementation plan to be legally tenable at the local level. The goal of SPES is for 30-40 municipalities to introduce a medium-sized zero-emission zone by 2025.

3.4.4. Domain D - Mobility-related data collection and indicators at local level

Within Domain D, the consortium collected (a) city-level data on specific mobility-related topics as defined by the ToR – and in some cases going beyond the ToR – including a number of indicators based on methodologies developed within the SUMI project as well as revised proxy data spreadsheets developed for this study, simplifying the SUMI methodologies, and (b) information on data collection practices and routines in the cities that cooperated in this study.

Data for this domain was collected through the cross-domain survey which has been filled in first by the domain expert, thereafter by the country managers, and finally validated and completed by the city representatives for those cities that cooperated in this study. Of the 125 cities, 65 have validated and completed the survey. The remaining cities have been covered by country managers, either fully or partially, via desk research.

In addition, in order to collect information on the domain, 6 excel spreadsheets were developed for the proxy indicators and 2 of the original SUMI indicator spreadsheets - Road Deaths and Traffic Safety Active Modes - were used. The proxy spreadsheets as well as the spreadsheets for two SUMI indicators have been prefilled as much as possible by the Country Managers. Cities that cooperated in the study were then asked to validate
and complete the spreadsheets, while not all city representatives did so. The objective of the alternative excel spreadsheets prepared for the study was to collect relatively easily available proxy data on indicators, and to understand whether cities can generally provide this data, especially in comparison to the original SUMI methodologies which in quite some cases are based on rather sophisticated, precise – but also very demanding – calculation methods. Indeed, quite some cities found it rather difficult to provide all required data in order to be able to calculate all SUMI indicators. The revised excel spreadsheets developed for this study do not calculate an indicator score between 0 and 10 (like the SUMI indicators) and hence are not indicators in the narrow sense.

The number of cities for which each excel spreadsheets have been filled in, are as follows:

- **Affordability of public transport (proxy)** – 114 cities;
- **Affordability of public transport for the poorest (SUMI)** – 29 cities;
- **Air pollutant emissions (proxy)** – 47 cities;
- **Air pollutant emissions (SUMI)** – 14 cities;
- **Road deaths (proxy & SUMI)** – 86 cities;
- **Traffic safety active modes (proxy & SUMI)** – 43 cities;
- **Access to public transport (proxy)** – 50 cities;
- **Accessibility to mobility services (SUMI)** – 20 cities;
- **Greenhouse gas emissions (proxy)** – 57 cities;
- **Greenhouse gas emissions (SUMI)** – 13 cities;
- **Congestion (proxy)** – 87 cities;
- **Congestion and delays (SUMI)** – 20 cities;
- **Modal split (proxy)** – 101 cities;
- **Modal split (SUMI)** – 19 cities15.

The dataset allowed us to develop the following indicator sheets for Domain D (available in Annex D):

- **Data availability at the local level and related challenges**
- **Availability of shared mobility services**;
- **Typology of public transport buses in active use**;
- **Availability of digital public transport tickets**;
- **Presence of an active parking management policy in effect**;
- **Presence of a Mobility-as-a-Service (MaaS) offer**;
- **Retrieval of data from mobility operators and mobility platforms**;
- **Other urban mobility indicators**;
- **FFS: Affordability of public transport**;
- **SUMI: Affordability of public transport for the poorest**;
- **FFS: Air pollutant emissions**;
- **SUMI: Air pollutant emissions**;
- **SUMI: Road deaths**;
- **SUMI: Traffic Safety Active Modes**;
- **FFS: Access to public transport**;
- **SUMI: Accessibility to mobility services**;
- **FFS: Greenhouse gas emissions**;
- **SUMI: Greenhouse gas emissions**;
- **FFS: Congestion**;
- **SUMI: Congestion and delays**;
- **FFS: Modal Split**;

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15 It should be noted that generally fewer SUMI indicator sheets than proxy data sheets developed for this study had been filled in by the participating cities, as the cities – in case of time constrains – were requested to focus on filling in the proxy data sheets first.
SUMI: Modal Split.

The figure below provides an overview of the results from the data collection on this specific domain. For the complete and detailed version of these indicators, please refer to Annex D.

**Figure 17: Overview of the results from the data collection on Domain D**
The description of the main findings for Domain D, are provided below, according to the different data sources.

3.4.4.1. Source: Online survey

Data availability at the local level and related challenges

This section of the questionnaire has been answered by city representatives only and contained the following questions:

1. Does the city routinely collect any kind of mobility-related data at city-level or another geographic area?
Feedback on this question is available for 90 cities. **90% of these cities routinely collect urban mobility-related data** at city-level or another geographic area. The cities that answered this question with a “no” are mostly smaller cities.

1. **Geographical area(s) the city collects mobility-related data on:** **City, Inner urban area, Other.**

Feedback on this question is available for 73 cities. **89% of these cities collect mobility-related data at city level and 42% for the inner urban area.** The 19% of cities collecting mobility-related data at other geographic levels do so for larger areas, e.g. metropolitan area, commuter region, neighbouring regions (incl. cross-border regions) and traffic between neighbouring cities, and smaller areas, e.g. immediate city centre such as the historic city centre, traffic in certain streets, or traffic around schools.

2. Please indicate on which transport-related topics the city collects some kind of data, to capture the current situation and to track the development over time.

Feedback on this question is available for 73 cities. The following topics scored best in terms of some data being collected by cities: **road deaths** (88%), **modal split** (85%), **air pollutant emissions** (75%), **access to mobility services** (71%), opportunity for active mobility (70%) and traffic safety active modes (70%). Least data is collected on **urban functional diversity** (22%), **security** (23%), **mobility space usage** (29%), **affordability of public transport** (32%), and accessibility of public transport for mobility-impaired groups (56%).

3. **How often is this data being collected?**

Answer categories as for the previous question with the option to choose not applicable, every year, every 2 years, every 3 to 5 years, every 6 to 10 years, and other.

Feedback on this question is available for 69 cities. On most topics, cities collect data at least once every two years. On the following topics, data is being collected by cities less often than every two years: affordability of public transport, noise annoyance, satisfaction of the quality of public spaces, urban functional diversity, commuting travel time, and modal split. The following topics scored best in terms of some data being collected by cities every year: **road deaths** (85%), traffic safety active modes (78%), energy efficiency (65%), air pollutant emissions (62%), greenhouse gas emissions (60%) and congestions and delays (56%). Two topics had somewhat higher scores in terms of data being collected by cities only every 6 to 10 years: modal split (27%) and noise annoyance (12%).

Some cities stated that they collect data on certain topics more often than once a year, with data on for example air pollutant emissions, greenhouse gas emissions, road deaths and congestion in some cases being collected/ reported/ summarised on a monthly basis.

4. **Who is responsible for the collection of mobility-related data?**

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16 Road deaths by all transport-related accidents; or similar

17 Air pollutant emissions of all passengers and freight transport modes (exhaust and non-exhaust for PM2.5); or similar

18 Share of population with appropriate access to public transport; or similar

19 Data to capture the quantity and quality of infrastructure for walking and cycling

20 Data to capture the mix of spatial functions; i.e. degree of proximity between businesses, hospitals, schools, retail, residential areas, parks etc.

21 Perceived risk of crime and passenger security in urban transport; or a similar indicator

22 Data about the proportion of land use, taken by all city transport modes (direct and indirect uses); or similar

23 Share of poorest quartile of the population’s household budget required to hold public transport passes; or similar

24 Data about the total energy use by urban transport per passenger-km and ton-km; or similar

25 Well-to-wheels GHG emissions by all urban area passenger and freight transport modes; or similar

26 Delays in road traffic and in public transport during peak hours compared to off peak travel; or similar
Feedback on this question is available for 71 cities. In more than half of the cities (55%) a dedicated city department in charge of transport/mobility is responsible for collecting mobility-related data, often in cooperation with other bodies such as the public transport operator or Road Authority. 31% of the cities stated that the responsibility for data collection is shared and that different data is collected by different bodies, e.g. various city departments (department of mobility, of environment, of statistics, etc.), the public transport operator, the public transport coordinator at the regional level, the Traffic Management Centre, the Road Authority, the police, etc. In some cases, the main responsibility for data collection is outsourced to agencies/companies owned by the city/regional authority or private companies (e.g. in the framework of the development of a SUMP).

5. Is there one central city department, which is responsible for storing the data collected by different city departments and external organisations in a central database? If yes, which department?

Feedback on this question is available for 66 cities. 61% of the cities do not have one central city department responsible for storing the data collected by different city departments and external organisations in a central database. The 39% that have such a department, and most often it has been mentioned that the responsibility for storing data lies with the statistics department, the mobility department, the strategy department, the planning department, the development department, the public space department, or the IT department.

6. How is the data being stored?

Feedback on this question is available for 20 cities. From the answers it can be concluded that cities store data in many different ways, from excel tables on a SharePoint to comprehensive data storage software tools (Azure Data Lake was mentioned as an example). Data is usually stored on city-owned servers according to data privacy regulations. Partly data is made available on open data platforms.

7. What are the city’s main challenges regarding the collection and analysis of urban mobility-related data?

Feedback on this question is available for 68 cities. The following challenges regarding the collection and analysis of urban mobility-related data were mentioned by at least half of the sampled cities: data held by many different departments, agencies, companies, etc.; difficult to compile in one place (74%), lack of staff numbers to collect, compile and analyse data (65%), and costs related to the collection of purchase of data (49%).

8. Does the city have an explicit target with regards to data routines, responsibilities, data partnerships, data storage etc.?

Of the 50 cities who answered the question 15 cities replied with “yes” and 27 cities with “no”27. Several cities mentioned very specific objectives. For example, Barcelona’s SUMP proposes to increase the Gigabyte of mobility data in the city database made available - as open data - from 68 to 79 GB, and at the same time to improve the quality of the mobility data. Groningen stated that they aim to achieve 90% up-to-date, reliability and correctness of mobility data by 2023. Also, more general objectives have been mentioned such as to develop a unified database for mobility data accessible to different public sector institutions or not to duplicate data sets/data collection endeavours. Some cities mentioned that explicit targets exist for indicators included in their SUMP/Transport Plan/Mobility Strategy or with regarding the monitoring of the implementation of these plans. Also, it has been mentioned that objectives exist but are not specifically related to mobility data or only for specific areas such as air quality monitoring.

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27 Please note, this was an open-ended question and there were 8 answers out of 50, that were not considered valid.
9. Are there any national regulations, targets or support (financial or otherwise) for cities as regards to data gathering on urban mobility?

Of the 81 cities who answered the question 20 cities reply “yes” and 53 with “no”. Among the cities that replied ‘Yes’, it appears that the provision of data to the National Access Point at the federal level is the most common requirement. A city in France mentions that there are several laws that require the provision of mobility data while in Croatia it seems that the local transport plan sets some data collection targets. And a city in Finland stated that there is a legislation that mobility service providers need to provide access to data to third parties in order to enable MaaS development.

**Availability of shared mobility services**

1. Are any shared mobility services (including micro-mobility services) available in the city?

Feedback on this question is available for 109 cities. **In 80% of the sampled cities shared mobility services are available**, while in the other 20% they are not. The examples of new mobility services mentioned in the survey are car sharing (station based or free-floating), bike sharing, e-bike sharing and e-scooter sharing (stand-up or seated).

2. What types of shared mobility services are available in the city? Answer categories provided. If other, specification requested.

Feedback on this question is available for all 86 sampled cities which have shared mobility services. In the order of the highest percentage of availability these shared mobility services are available in these cities: bike sharing (63%), e-scooter sharing (stand-up) (50%), station-based car sharing (40%), free-floating car sharing (39%), e-bike/ pedelec sharing (30%), e-scooter sharing (seated) (17%), other (10%). Other shared mobility services that are available in cities are (e-)cargo bike sharing, in one case with dedicated schemes for entrepreneurs, NGOs and citizens, and sharing schemes for private cars.

3. What is the percentage of your local population that is served by these shared mobility services?

Feedback on this question is available for 47 cities. 55% of the bike sharing schemes are serving up to 10% of the population, while 30% are serving up to 40% of the population. Only 12% are serving up to 80% and 3% are serving up to 100% of the population. 68% of the e-bike/ pedelec sharing schemes are available to 10% of the population, while 26% are serving up to 40% of the population. 87% of seated e-scooter sharing schemes are available to 10% of the population, while 13% are serving up to 40% of the population. 50% of stand-up e-scooter sharing schemes are available to 10% of the population, while 43% are serving up to 40% of the population. Only 7% are serving up to 80% of the population. 55% of the free-floating car sharing schemes are serving up to 10% of the population, while 23% are serving up to 40% and another 18% are serving up to 80% of the population. Only 5% are serving up to 100% of the population. 70% of the station-based car sharing schemes are serving up to 10% of the population, while 23% are serving up to 40% of the population. Only 7% are serving up to 80% of the population.

4. Geographical area that is served by the respective shared mobility service [in km²].

For bike sharing schemes (based on data from 22 cities) the geographical area served in cities varies between **2 and 400 km²**, with a large share of cities being served 20-50 km² (55 km² on average). For e-bike/ pedelec sharing (based on data from 10 cities) the geographical area served in cities varies between **6 and 400 km²** (76 km² on average). For seated e-scooter sharing schemes (based on data from 4 cities) the schemes serve **39 and 87 km²** respectively (48 km² on average). For stand-up e-scooter sharing schemes (based on data from 14 cities) figures vary between **5 and 87 km²** (30 km² on average). For free-floating car sharing schemes (based on data from 10 cities) figures vary between **8 and 162 km²** (74 km² on average). For station-based car sharing schemes (based on data
from 10 cities) **figures vary between 20 and 140 km²** (71 km² on average). From the low number of cities for which this information is available, it can be assumed that many cities are not aware of the geographical area served (in km²) by the respective shared mobility service available in their cities, or it was too time-consuming to calculate this figure.

5. **Geographical area that is served by the respective shared mobility service as percentage of the total area of the city [in %].**

For bike sharing schemes (based on data from 22 cities) the geographical area served in cities varies between 1% and 105% of the total area of the city, with a large share of cities being served 40-75% (45% on average). For e-bike/ pedelec sharing (based on data from 13 cities) the geographical area served in cities varies between 10% and 105% of the total area of the city, with four cities between 10% and 25%, and the other five cities with 64-100% (59% on average). For seated e-scooter sharing schemes (based on data from 6 cities) the schemes serve between 38% and 70% of the total area of the city (41% on average). For stand-up e-scooter sharing schemes (based on data from 19 cities) figures vary between 2.5% and 100%, with a large share of cities being served 50-100% (49% on average). For free-floating car sharing schemes (based on data from 9 cities) figures vary between 8% and 100%, with the majority of cities between 60% and 100% (68% on average). Again, from the low number of cities for which this information is available, it can be assumed that many cities are not aware of the geographical area served (in %) by the respective shared mobility service available in their cities, or it was too time-consuming to calculate this figure.

6. **Number of vehicles available per operational type of the shared mobility service available.**

Feedback on this question is available for 65 cities. The highest number of vehicles are available for free-floating e-bike / pedelec sharing schemes (2,915 vehicles on average per city) station-based stand-up e-scooter sharing schemes (2,716 vehicles on average per city), and for free-floating stand-up e-scooter sharing schemes (1,673 vehicles on average per city). The lowest number of vehicles are available for hybrid or other seated e-scooter sharing schemes (293 vehicles on average per city). **Independently from whether the scheme is station-based, free-floating, hybrid or other, the scheme with the highest number of vehicles on average per city are stand-up e-scooter sharing schemes, and seated e-scooter sharing schemes is the service presenting the lowest number of vehicles available.**

7. **Type of operators for each type of new mobility service available.**

Feedback on this question is available for 82 cities. In terms of types of operators, **the majority of sharing schemes are owned by private companies** (100% for free-floating car sharing schemes and seated e-scooter sharing schemes, 96% for station-based car-sharing schemes and 96% for stand-up e-scooter sharing schemes). **53% of the bike sharing schemes and 48% of the e-bike/ pedelec sharing schemes are city-owned.**

8. **Name(s) of the privately-owned operators.**

Feedback on this question is available for 77 cities. The **most-mentioned privately-owned operators** are:

- Bike sharing: NextBike, Donkey Republic, Mobike, Limebike. Rest: local or national operators;
- E-bike/ pedelec sharing: No operator mentioned more than twice;

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28Station-based stand-up e-scooter sharing schemes also include schemes that do not necessarily have a station but for which e-scooters may only be parked in designated areas.
o E-scooter sharing (stand-up): Bird (6), Bolt (11), Circ (4), Dott (4), Lime (14), Tier (13), Voi (10), Other (32). In many cities there are several operators;
o E-scooter sharing (seated): Blinkee (4). Apart from that large variety of operators, without others being mentioned more often;
o Station-based car sharing: Cambio. Apart from that large variety of operators;
o Free-floating car sharing: ShareNow.

**Clean public transport buses in active use**

1. Number of public transport buses in active use in the city. How many of those public transport buses qualify as clean buses\(^{29}\) (excluding zero-emission buses)?

Feedback on this question is available for 67 cities. The average share of clean buses of the total number of public transport buses in active use across all sampled cities is 15.4%. The largest number of clean public transport buses in active use across the sampled cities independently from their size are natural gas buses (111) and battery electric buses (50). There are no deviations regarding the share of different types of clean buses considering city size, apart from synthetic and paraffinic fuel buses only being operated in a medium-sized city that participated in this study.

2. How many of those public transport buses qualify as zero-emission buses\(^{30}\)?

Feedback on this question is available for 58 cities. The average share of zero-emission buses of the total number of clean public transport buses in active use across all sampled cities is 16.1%. Interestingly, the average absolute number is higher in metropolitan areas (44.3) compared to large metropolitan areas (35.8), with the average absolute number across all sampled cities being 23.2.

**Availability of digital public transport tickets**

1. Are digital tickets (i.e. on smartphone or chip-card) available for some or all public transport services? Yes, for all modes/services or yes, for some modes/services or no.

Feedback on this question is available for 110 cities. In 62% of the sampled cities digital public transport tickets are available for all modes/services, for some modes/services it is available in 26% of the cities, and in 12% of the cities no digital public transport tickets are available.

2. Which modes/services are covered by digital tickets?

In the 97 cities that have available digital public transport tickets, such tickets are available for all modes provided as options in the survey (metro, tram and bus), apart from taxis for which 88% of these cities have digital tickets available. In some cities digital tickets are also available for other modes: trolleybus (which were not provided as a separate category), urban trains and light rail.

3. Which digital ticket type(s) are available for the respective modes?

Feedback on this question is available for 95 cities. Regarding digital tickets for buses, single tickets are available in 95% of the sampled cities, 24h passes in 77% of the cities, and monthly passes in 82% of the cities. Regarding digital tickets for the metro, single tickets are available in 89% of the cities, 24h passes in 93% of the cities, and monthly passes in 100% of the cities. Regarding digital tickets for trams, single tickets are available in 100% of the cities, 24h passes in 85% of the cities, and monthly passes in 85% of the cities. *Regarding digital tickets for...

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\(^{29}\) Definition provided: Clean buses are buses using one of the following alternative fuels: hydrogen (fuel cells), battery electric (including plug-in hybrids), natural gas (both CNG and LNG, including biomethane), liquid biofuels, synthetic and paraffinic fuels, liquified petroleum gas (LPG).

\(^{30}\) Definition provided: A zero emission bus is a bus, which emits no tailpipe emissions, that is, purely battery electric buses (excluding hybrid buses) or hydrogen-powered buses.
taxis, single tickets are available in 88% of the cities, 24h passes in 14% of the cities, and monthly passes in 29% of the cities.

4. Are digital tickets available for services of all operators?

Feedback on this question is available for 89 cities. In 83% of these cities, digital tickets are available for service of all operators, while in 17% there aren’t. Most often, taxi tickets are not available. Some cities mentioned that digital tickets are sometimes only available for publicly owned public transport operators and that privately-owned smaller (bus) operators are not always part of the system. Luxembourg is a special case as public transport is free and hence no ticket is needed.

5. In which format are digital tickets available?

Feedback on this question is available for 88 cities. In 73% of these cities, tickets are available as smartphone tickets, in 64% as pre-paid chip-card tickets, in 31% debit/credit cards can be used as tickets, and in 15% other tickets are available, e.g. tickets via SMS. One city mentioned that while debit/credit cards do not act as tickets they can be used to buy single tickets on many buses, trams, and trains.

6. What is the percentage of trips undertaken with digital tickets in relation to the total number of all trips?

Feedback on this question is available for 28 cities. In 29% of these cities up to 100% of all trips are undertaken with digital tickets in relation to the total number of all trips, in 25% up to 80%, in another 21% up to 40% and in the remaining 25% of cities up to 10%. As for the vast majority of cities no data is available on the percentage of trips undertaken with digital tickets, it can be concluded that they either do not have such data or it was too time-consuming to research this information for this study.

Presence of an active parking management policy in operation

1. Is there any kind of active parking management policy in effect in the city?

Feedback on this question is available for 108 cities. 77% of these cities have an active parking management policy in effect, while 23% don’t. Looking at city size, an active parking management policy is in effect in 92% of the large metropolitan areas, in 71% of the metropolitan areas, in 88% of the medium-sized urban areas, and in 70% of the smaller urban areas.

2. In which area(s) is this active parking management policy in effect? Covering the entire city or covering certain parts of the city.

Feedback on this question is available for 74 cities. In 58% of these cities the parking management policy is in effect only in certain parts of the cities, while in 42% it is in effect in the entire city. Examples of certain areas covered by the active parking management policy as mentioned in the survey: inner city/ historic city centre, inner ring road zone, certain districts, and residential areas. Also, exemptions were mentioned, for example for loading & unloading as well as for Park & Ride parking lots. In many cases, parking fees only need to be paid at certain times of the day.

3. Which types of active parking management instruments are in place?

Feedback on this question is available for 80 cities. In 90% of these cities, regulations are in place (e.g. on-street parking regulation, off-street parking regulation, limits for maximum length of stay, improved enforcement), in 81% of these cities planning instruments are in place (dedicated residential parking

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31 Active parking management is the dynamic management of parking facilities in a region to optimise performance and utilisation of those facilities while influencing travel behaviour at various stages along the trip making process: i.e., from origin to destination.
areas, maximum parking standards for new buildings, Park & Ride facilities, parking guidance system), 80% of these cities have incentives (on-street parking pricing, off-street parking pricing, smart pricing), and 10% of these cities have others types of instruments in place (e.g. evaluation of supply and demand for parking facilities).

4. What has been the impact on the number of cars and/or congestion in the city since the introduction of this instrument/ these instruments?

Feedback on this question is available for 23 cities. Regarding the impact on the number of cars and/or congestion in city since the introduction of active parking management policies, the following feedback was received from cities: reduction of annual increase of private cars, decrease in motorised traffic, slight shift to sustainable modes in modal split, greater opportunity for residents to park their cars in the streets, extension of pedestrian area, fewer cars parked for longer duration (higher rotation), shift of parking pressure to areas bordering the regulated area, and time spent looking for a parking space has decreased. A few cities stated that they do not (yet) evaluate the impact. From the low number of cities that replied to this question it can be assumed that many cities are not aware of the impact of the parking policies on the number of cars and/or congestion in the city, or it was too time-consuming to provide an answer to this question.

Presence of a Mobility-as-a-Service (MaaS) offer

1. Is there any kind of Mobility as a Service (MaaS) offer in the city32? If not, are there any plans to introduce a MaaS offer in the foreseeable future?

Feedback on these questions is available for 123 cities. 28% of the sampled cities have a MaaS offer in place, the majority of the sampled cities (43%) has no MaaS offer but there are plans to introduce a MaaS offer in the foreseeable future, and 29% don’t have a MaaS offer and are also not planning one in the near future. Regarding the plans for introducing MaaS offers, they are all planned for the coming year, with many being planned to be launched within the next 12 months. In most cases, the MaaS offer will be introduced by the city, usually in cooperation with the respective public transport provider. Quite some cities mentioned that MaaS offers are being developed within projects receiving EU or national funding. Cooperation with private companies providing MaaS-related services has been mentioned several times. Many pilot projects are already underway. Often, the starting point is a mobile ticketing app for the PT operator, which then is extended to other modes. Crucial steps mentioned are the need to develop a regulatory framework and the need to clarify the role of the city regarding data standards and data brokering.

2. What type of MaaS33 offer is in place?

Looking at the 34 sampled cities that have a MaaS offer in place, 87% of them have MaaS operator(s) (and integrator(s)). 84% of the cities have smartphone apps where dynamic multi-modal transport options (where relevant across different operators) are provided. 65% of the cities have online options (website or smartphone app) to pay tickets for multi-modal trips (and where applicable: across operators). 26% of the cities have website(s) where dynamic multi-modal transport options (where relevant across different operators) are provided.

The table below shows examples of MaaS offers.

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32 Definition provided: Mobility as a Service (MaaS) is the integration of various forms of transport services into a single mobility service accessible on demand. To meet a customer’s request, a MaaS operator facilitates a diverse menu of transport options, be they public transport, ride-, car- or bike-sharing, taxi or car rental/lease, or a combination thereof. For the user, MaaS offers added value using a single application to provide access to mobility, with a single payment channel instead of multiple ticketing and payment operations.

33 Definitions provided: The MaaS operator provides the MaaS solution and sells mobility services to travelers. The MaaS integrator gathers and integrates data from mobility service providers.
<table>
<thead>
<tr>
<th>Country</th>
<th>MaaS offers</th>
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<tbody>
<tr>
<td>Klagenfurt</td>
<td>Stw - Stadtwerke Klagenfurt</td>
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<td>Antwerp and Gent</td>
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<td>Rijeka</td>
<td>Rijeka City Card – RCC and Urban mobility Rijeka</td>
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<td>Brno</td>
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<td>Rejseplanen</td>
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<td>Helsinki</td>
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<td>Marseille</td>
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<td>Aachen</td>
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<td>Heraklion</td>
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<td>Malta</td>
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<td>Brescia</td>
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<td>Ljubljana</td>
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<td>Barcelona</td>
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<td>Madrid</td>
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<td>Gothenburg</td>
<td>Vasttrafik, two pilots: UbiGo, EC2B</td>
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<td>Stockholm</td>
<td>Fluidtime</td>
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<tr>
<td>London</td>
<td>Citymapper PASS</td>
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</table>
Does the city authority provide an open back-end platform?

Feedback on this question is available for 16 cities. Only 31% of the cities provide an open back-end platform for the MaaS offer while 69% don’t.

3. Who acts as a MaaS integrator? Answer categories provided. Public transport operator, private company. Please tick both if public transport operator is a private company.

Feedback on this question is available for 24 cities. In 25% of cities, a private company not being the PT operator acts as the MaaS integrator, while in the other 75% it is the public transport operator. In four of these cases, the private transport operator is an entirely independent private company.

4. Which modes are covered by the MaaS service?

Feedback on this question is available for 24 cities. The following modes are covered by the MaaS service, ordered by percentages: bus (87%), tram (61%), rail (57%), bike-sharing (52%), metro (43%), station-based car sharing (39%), taxi (30%), e-bike/ pedelec sharing (26%), e-scooter sharing (stand up) (22%), free-floating car sharing (26% each) and ride sharing (13%).

5. Are there any impacts of the MaaS options on the modal split? Please explain, ideally with figures about the modal split before and sometime after the introduction of MaaS offers.

None of the sampled cities with a MaaS offer has data on impacts of MaaS options on modal split. Only one city, Sanem/ Luxembourg, mentioned that it is planned to collect such data from 2025 onwards. If cities provided a more detailed answer, usually it was stated that no data is collected yet.

6. Is the MaaS linked to any mobility planning objective of the city?

Feedback on this question is available for 12 cities. Usually, the link of MaaS offers to the city’s mobility planning objectives is rather general, i.e. the increase of sustainable modes in the modal split, esp. more public transport users. Often, MaaS is mentioned in the city’s SUMP as one measure to contribute to a more sustainable mobility system. In a few cases, concrete goals were mentioned, e.g. the inclusion of taxis to serve as demand responsive transport in sparsely populated areas.

Retrieval of data from mobility operators and mobility platforms

1. Do mobility operators and mobility platforms that provide services in your city share data with the city?

Feedback on this question is available for 67 cities. In 28% of the sampled cities, mobility operators and mobility platforms that provide services in the city share data with the city fully, in 46% of the cities data is shared only partially, and in 25% of the cities data is not being shared at all. If mobility operators and mobility platforms that provide services in the city share data only partially, cities have mentioned that private companies often do not share information on the number of passengers or data related to the financial capacity. Generally, commercially sensitive data is difficult to receive, although one city stated that operators are willing to share data when they see a benefit in it. The provision of data depends on whether regulations are in place, especially for public transport operators (partly) owned by the city. Barcelona provided limited licenses to operators with one of the requirements being the obligation to share data with the city starting five months after deployment of their fleets.

2. Which mobility operators and mobility platforms share data with the city?

34 Definition provided: The MaaS integrator gathers and integrates data from mobility service providers.

35 Explanation provided: the aim of this question was to understand whether the contract with a Maas operator includes any obligation to achieve certain results (e.g. a decrease use of cars by x %) rather than only a requirement to establish a MaaS platform (as it often is the case). Where the city itself is developing the MaaS: Are specific traffic goals tied to the establishment of a MaaS platform?
Feedback on this question is available for 39 cities. Regarding sharing of data with the city by mobility operators and mobility platforms, usually cities receive data from PT operators, sometimes though a defined protocol (especially when the PT operator is (partly) owned by the city), or upon request. Often, regulations are in place that shared mobility services providers that are using public space need to provide data to the city. Data from companies like Uber and from taxi operators is rather difficult to obtain while it is less difficult to receive data from car sharing operators.

3. How does the city use data?

Feedback on this question is available for 39 cities. The following examples on the use of data have been mentioned by cities:

- planning/optimisation of mobility measures, e.g. enhancement of public transport services, public space and traffic flows; allocation of vehicle sharing areas or of bus stops; planning of intermodal areas or city development plans/projects; etc.;
- monitoring, evaluation, assessment (incl. cross-time comparisons), indicator definition (often related to SUMP), e.g. CO₂ emissions assessment; evaluation of uptake of different services in different parts of the city;
- scenario development; etc.;
- policy development;
- transport model;
- interactive maps;
- studies, e.g. related to city planning;
- timetable planning and route optimization for public transport;
- infrastructure planning.

4 cities have stated that they do not use the data at all or not yet.

4. Is some (or all) of this data being made publicly available (open source data)?

Feedback on this question is available for 45 cities. The majority of cities (53%) are making some of the data publicly available as open source data while 44% of the cities are not sharing the data publicly. Only one city stated that all data is shared publicly.

Motorisation rate

Please provide the motorisation rate in your city in registered cars (excluding trucks, vans, buses) per 1,000 inhabitants.

Feedback on this question is available for 91 cities. The motorisation rate in the sampled cities varies between 209 and 1,001 registered cars (excluding trucks, vans, buses) per 1,000 inhabitants, as shown in the table below.
3.4.4.2. Source: Proxy data spreadsheets prepared for this study

**Affordability of public transport**

This proxy indicator is defined as the price per single trip ticket, which allows one journey for an adult without special benefits to travel from the city boundary to the city centre, weighted by national Purchasing Power Parity.

**Data availability, validity and comparability for this indicator is very good.** One of the two parameters that feed this indicator (national purchasing power parity) is available at the same definition for all European countries. The other, and decisive parameter, that is the price per single public transport (PT) ticket was provided for a total of 114 cities. The definition of this parameter is quite straightforward. It can therefore be assumed that the data across cities have a high degree of comparability.

It is another question, however, to what degree the price per single PT ticket captures the everyday-life patterns and needs of the local population. For example, it can be assumed that many commuters will purchase monthly tickets – different cities offer quite different rebate programmes for such time passes, which would make comparability again difficult. In other words, the attempt to determine the affordability of PT struggles with a trade-off between validity and comparability.

In any case, what can be observed is a very broad spread of single ticket prices from €6.79 (London) to €0.00 (Sanem and Luxembourg City in Luxembourg, Koprivnica in Croatia). The latter can be explained by the free public transport schemes in these cities. A meaningful comparison of ticket prices means that the absolute ticket price has to be weighed by the national purchase power – this is built into the FFS indicator definition. This then leads to a spread from €5.62 to €0.00. The maximum is the figure from London, which has not only a very dense but also a particularly expensive PT system – this appearance of a high-cost PT in London is therefore not necessarily meaningful for
people’s everyday mobility needs because few people will need to traverse the entire PT catchment area on a daily basis. This challenge could only be countered with another weighing factor.

**Air pollutant emissions**

This proxy indicator is defined as the average annual NO₂ and PM emissions from road transport within the city.

Data from 47 cities was of a quality and plausibility that could be considered for the overall assessment of air pollutant emissions. Most data were very recent, typically from 2019 or 2020 with the exception of 2018 (8 cities), 2016 (2 cities) and 2014 (1 city). The number of air quality measuring stations varied a lot: Several cities reported that they do not have any measuring stations; others submitted actual measurement data but did not indicate how many stations they have. Among those cities, who did submit a specific number of measuring stations, their number varies from one to 26 – a significant correlation between city size and station number could not be detected.

Furthermore, the position of measuring stations along busy roads versus in residential/green areas did not show any particular pattern. Looking at two German cities as an example, all of Duisburg’s 10 stations are positioned along busy roads while in Cologne the numbers are 11 (near roads) versus 2 (away from roads). In addition, not all measuring stations measure all types of pollutants. This is extremely problematic from a methodological point of view because it results in some situations where there is emission data from residential/green areas but non from busy roads. This results in negative overall indicator values because its formula subtracts the former from the latter in order to gauge the pollution impact of traffic and not of other sources. This could be remedied to some extent with a more sophisticated computation logic – but even then, the above-mentioned problems would persist. Genuine comparability could only be achieved through a clearer and European-wide stipulation of the number, position and quality of measuring stations. Hence, it must be concluded that the proxy indicator sheet developed for this study does not work well enough, at least not for cities with a low number of measuring stations.

Looking at the 26 cities with at least one measuring station in both types of areas (busy roads and residential/green areas), the average annual concentrations range from -12.18 µg/m³ (NO₂), -4.0 µg/m³ (PM₁₀), -11.0 µg/m³ (PM₂.₅) to a maximum of 24.0 µg/m³ (NO₂), 23.38 µg/m³ (PM₁₀) and 16.21 µg/m³ (PM₂.₅). This confirms the unreliability of the proxy indicator sheet used in this study with a low number of measuring stations. In fact, the suitability of the indicator definition as applied is rather questionable. When originally devised, two assumptions inspired this definition: 1) It would be much more practical compared to the homonymous SUMI indicator with its high demand for data procurement. 2) Air quality measuring stations are widely in use across Europe and well spread within cities. Whereas assumption 1) can be confirmed, assumption 2) turned out to be over optimistic.

**Access to public transport**

This proxy indicator is defined as the percentage of the population with appropriate access to public transport. Overall, some data is available from 81 cities; however, the data from only 50 cities contain actual information about access rates to the public transport (PT) system. This is because Country Managers pre-filled population data for certain cities but could not determine actual PT access figures – in 29 cases, the cities themselves could not or did not provide this missing information.

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Among all data sets with certain access figures, two had suspiciously low results and were cleared from the analysis. Across all cities, the data provided is quite up to date with the oldest data point being from 2008, one from 2015, three from 2016 and the overwhelming majority from 2017 or later. 33 data sets are from 2019 or 2020.

**The methodological consistency across all datasets is problematic.** Many cities did not specify which method they were using; it seems risky to assume that this can be interpreted as implicit confirmation that the suggested FFS method was used. Many other cities explicitly deviated from the FFS method and provided a related explanation – in most cases, this had to do with existing data that had been calculated differently. **The most frequent deviation had to do with different distance radii around PT stops.** The requested radius was 500 metres, whereas several cities provided data for 300-metre radii, others for 400 metres, some for 600 metres. Certain cities (e.g., Vienna, Groningen) apply different radii for different PT modes such as BRT, light rail or bus. Other cities (e.g., Cologne) apply different radii for the city centre and the outskirts of town.

Inconsistencies are also included – but possibly inevitable – because of the existence and (non-)inclusion of certain special services such as scheduled on-demand lines, door-to-door shared taxis, exclusive stops for school buses and because of considerations (or lack thereof) for radically different service frequencies. Also, the spatial context of some cities is very different from others and thus impedes comparability. For example, the administrative boundaries of Koprivnica cover extremely heterogeneous areas from urban to almost rural; the ex- or inclusion of the latter affects the indicator value significantly.

**A majority of cities provided data that was based on Geographic Information Systems (GIS) calculations. Some use proprietary software whereas others deliver credible results with free open source solutions.** Certain differences and incompatibilities are due to the fact that some cities use the actual walking distance around PT stops whereas the majority applies Euclidean “air-line” distances. It can be assumed but is not known, that cities that did not provide any data at all simply do not have a GIS system. What is known about ca. one-third of all cities is that their data is derived from either “estimation based on local knowledge” or from various types of surveys about the actual distance to PT stops or about the subjective satisfaction with the PT system (and assumed implied satisfaction about the proximity to the nearest PT stop). In a few cases, cities reported an official policy to locate PT stops no further apart than x metres and derive accessibility claims from this. Also, some other assumptions had to be made in several cities, in particular about the actual number of residents in certain areas; where this data was not available estimates had to be applied such as the multiplication of household numbers with the average household size.

Feedback of a more conceptual nature was provided from several cities who argued that the PT coverage areas should not only focus on places of residence but also on key destinations such as major employment centres because this is a key determinant of a good PT system. Several cities also remarked that the definition and aspiration of a good PT system vary from city to city and therefore “a benchmark at European level” does not take into account the different Public transport authority philosophies”.

Despite all these difficulties it can be concluded that the access to the PT system – at least as defined in the sense of this study – can be considered as reasonably good. Seven cities even report a maximum score of 100%. However, this does not yet say anything about accessibility in terms of barrier-free access for the mobility impaired, service frequency, PT costs, etc.

**Greenhouse gas emissions**

This indicator is defined as the transport-related greenhouse gas emissions in metric tons of CO₂ (equivalents) per capita and per year. 57 cities reported some data on transport-related GHG emissions per capita and per year. The data from 2 cities had to be excluded from the analysis, however, because of implausibly low values (0.03 tons or less).
An initial plausibility check led the attention to a comparison of values of cities in the same country – based on the assumption that these values should not vary dramatically. The distribution among German cities is 1.25, 2.45, 2.58, 2.68; the first being Regensburg with 150,000 inhabitants and the 2nd, 3rd and 4th city being Duisburg, Bremen and Aachen, i.e. significantly larger cities. This indicates a reasonable degree of validity but still raises several questions.

A similar check for French cities reveals a spread of 1.03, 2.41, 6.30 for Marseille, Toulouse and Strasbourg respectively. The low value for Marseille and esp. the incredibly high value in Strasbourg raise the question about the respective calculation methodology. The situation in the Netherlands is different with values of 1.12 (Helmond), 1.32 (Groningen) and 1.36 (Nijmegen) – these cities all reported data from the same source, the national climate monitor database.

Figure 19. Comparison of greenhouse gas emissions in France, Germany and The Netherlands

This draws attention to the data sources more generally. Unfortunately, 30 cities did not specify any further information about the source or calculation method of their GHG emission figures; another four cities simply stated that their figure is derived from their SUMP. Conversely, only 13 cities reported their data source in somewhat more detail, albeit hardly at a level of depth that justifies robust conclusions.

The information from about 10 cities indicates that they seem to have undertaken some efforts to calculate their GHG emission data; in the cases of Netherlands, Germany, Sweden and Italy, a national or regional calculation tool seems to be available to assist with this – however, not all cities in these countries seem to have made use of these tools. One city (Luxembourg City) reported about their own calculation method and another (Timișoara) utilised a “JASPERS tool for calculating GHG emissions”.

Overall, the majority of values – if outliers are excluded – is in the credible range of 1.0 to 2.5 metric tons of CO₂ (equivalents) p.a. per capita. Nevertheless, the heterogeneity of data sources and calculation approaches makes it challenging to interpret this data reliably. It appears, however, that there are yet underutilised potentials for harmonisation; at least in the sense of country-internal comparability but possibly also more widely. These opportunities should be looked into.

**Congestion**

This proxy indicator captures the congestion level in a city. 87 cities reported some kind of data on congestion levels, either based on their own calculations or based on existing data from third-party providers.

Traffic Index data was available for 29 cities; INRIX data for 52 cities; TomTom data for 54 cities. In fact, certain cities themselves rely on such external data (TomTom: Gent,
Vilnius, Bucharest, Aachen. INRIX: Regensburg, Barcelona). All three third-party data sources were reported for only 18 cities. Although all such available data was pleasantly up to date (from 2019 or 2020), the overall comprehensiveness of third-party data coverage leaves a lot to be desired.

It remains to be investigated, however, whether more data can be purchased from these service providers and or whether publicly available data (e.g. congestion levels in Google maps) can be automatically processed; in fact, the Traffic Index is based on this method and could possibly be expanded (see http://trafficindex.org/how-it-works).

Interestingly, 11 cities reported data that was based on their own calculation method; 9 of them specified the data source, although in some cases just referencing a certain report. Only 7 cities provided some details about the actual calculation method. These include the actual SUMI approach (Lisbon, Timisoara) or a similar method that compares travel times during peak hours to free flow hours (Rijeka, Barcelona, Gothenburg), time lost per year, the difference between traffic volume and a theoretical capacity of a road, surveys and in-house calculations from public transport operators. The absolute values of such data range from 0.12 to 1,627 and are obviously not comparable – even any form of recalibration seems rather infeasible, even if full details of the computation method were available.

26 cities provided further interesting qualitative explanations and comments. Several of them (Umeå, Léon, Koprivnica) indicated that congestion is not a matter of serious concern and it is therefore not measured in any way. Other cities state without explanation that “regular data collection for congestion levels in the city is not common” (Daugavpils or – with similar words: Sanem).

A number of cities seem to be able to obtain data from regional or national data providers whereas other cities pursue their own calculation method. Zilina, for example, adopted a particularly straightforward approach by taking delay data from public transport vehicles as a proxy for congestion. Brno deploys a more sophisticated approach by using data from floating car data technology and – expected in the future from www.waze.com. Several cities have data for the most important roads but do not collect or compute city-wide congestion levels. Trikala mentions a transport model as a source of congestion data. Rostock deploys “several Bluetooth measuring stations” to deliver real time data on travel times.

Definitely noteworthy is what Bremen highlights as “key question” whether] certain congestion levels [can] also be a situation that creates a modal shift or on a more general level if they should try to avoid all kinds of congestion. This resonates with the conclusions of some CIVITAS projects (e.g. CREATE), which raised some big-picture questions about the nature and societal/ political implications of congestion.

Modal split

This proxy indicator is defined as the percentage share of each mode of transport for passenger mobility. The data collected from cities addresses passenger mobility only and distinguishes between four modes only: cars, public transport, cycling and walking (summarising e.g. bus, metro and tram under public transport).

Overall, data is available for 101 cities. Data availability and validity for this indicator are quite good, with some limits for data for certain cities. Inconsistencies appear when data for the share of cycling or pedestrians indicate 0 when the city has provided data for other modes of transportation. Most of the data is recent or very recent as more than half of the data provided range between 2017 and 2020. The rest of the data mostly dates back from 2010 to 2015, with a few exceptions from 1999, 2008 and 2009.
As shown in the figure above, the modal share of cars for the 101 cities ranges from 20% to 78%. Waterford has the highest share of cars while Groningen has the lowest. The share of public transport ranges from 1% to 70%. Heraklion and Helmond have the lowest share of public transport while Bratislava has the highest. The share of cycling ranges from 0% to 51%. Six cities have 0% share of cycling and 10 cities have 1% share of cycling; 12 cities have more than 25% share of cycling; Groningen has the highest share of cycling. Finally, the share of walking ranges from 2% to 64%, omitting the 0% share of cities that do not count walking. Aberdeen has the lowest share of walking while Léon has the highest. Interestingly, most medium-sized cities have a rather balanced share of the different transport modes. For example, Malmö has 34%, 25%, 26%, 14% for shares of cars, public transport, cycling and walking respectively. Most of the bigger cities have a more or less balanced share of transport modes, with usually a lower share of cycling. For example, for shares of cars, public transport, cycling and walking respectively Lyon has 30%, 30%, 3% and 37% while London has 36%, 37%, 2% and 25%.

Interestingly, the source of the data often comes from the analysis that the city conducted to create its SUMP. Data coming from other sources can include national surveys, cities’ surveys or traffic models. A plausibility check of this data raises questions regarding their comparability – certainly across, but also within countries. Cities differ in how they gather data to calculate their modal split. Some use surveys, data collected by the traffic management centre or via informal assessments. Some cities calculate their data based on the main mode of a trip; trips made in the most traffic heavy points of the city or counting the mode with which the longest distance has been covered. Some cities also count the mode considering the origin and destination of each trip.

Methodologies used by cities to evaluate the modal split of their transports vary, with some cities, such as Leuven, that use estimation of trips based on a traffic model that does not differentiate between cycling and walking. Other cities have analysed their
modal split by differentiating the type of trips (work or leisure trips) that influence the overall results. Some cities do not assess walking as they do not consider it a main mode of transport.

A majority of the sampled cities do not assess multimodal trips and only count the main mode of the trip or the mode of transport with which the longest distance has been covered. Some cities also count the mode considering the “origin and destination” of each trip.

The limitation of this analysis, which was mentioned by a few cities, is that the indicator does not consider other modes of transport (such as a motorcycle) and the cities could not add a share for other modes of transport.

3.4.4.3. Source: SUMI indicator spreadsheets

Road deaths

This SUMI indicator is defined as road deaths by all transport accidents in the urban area on a yearly basis. Within this study, data from 65 cities was of a quality and plausibility that could be considered for the overall assessment of road fatalities. In addition, data from 21 cities collected during the SUMI project was considered for the analysis. Most data were recent (2018-2019) with some specific data from 2011 or 2012. Some data was provided as an average over the last ten years. Most of the data come from the local police but others come from the cities or local governments and for some cities the data given come from different years. The data provided for the number of road deaths is accounted for a specific city boundary and not all the cities account for road deaths within the same urban area: some account for the city level, the whole municipality, the county or the entire district of the city. Some of the values shown consider the type of vehicles. An accident can involve a bus and a car. The total number of deaths will therefore be greater than the sum of deaths per category. On the other hand, some cities were not able to provide disaggregated data in terms of deaths per transport mode.

Overall, the indicator scores lie between 0 and 10. Road fatalities per 100,000 inhabitants’ range between 0 to 57. Respectively fatalities of pedestrians, bicycles, moped, motorcycle and cars range from 0 to 57, 0 to 6, 0 to 7, 0 to 75, 0 to 41. For light good vehicles (LGV), heavy good vehicles (HGV), bus and trams the road fatalities range respectively from 0 to 6, 0 to 10, 0 to 7 and 0 to 3. According to these results, the motorcycle is therefore the mode of transport with the most fatalities, followed by walking and car. The number of road fatalities varied from city to city but often correlated with the size of the city: smaller cities tend to have lower road fatalities than bigger cities.

Traffic safety active modes

This SUMI indicator is defined as the fatalities of active modes users in traffic accidents in the city in relation to their exposure to traffic. Cities had to provide the number of fatalities and the exposure measured in millions of trips for the corresponding traffic modes. A risk factor is calculated from these values as fatalities per billion trips for a certain traffic mode. The indicator value is calculated as a function of the weighted risk factor for both active modes together, with 0 indicating the lowest level of traffic safety for active modes and 10 indicating the highest level.

Within this study, data was collected for 29 cities. In addition, 14 spreadsheets could be used from cities that participated in the SUMI project. Altogether, data from 43 cities were of quality and plausibility that could be considered for the overall assessment of traffic safety active modes. A third of the data provided were given a source and a year ranging from 2018-2019 with some data dating from 2009. Some of the data came from local police, the city, the mobility plan or national statistics about traffic accidents. The data provided for the number of road deaths is accounted for a specific city boundary and not all the cities account for road deaths within the same urban area: some account for
the city level, the whole municipality, the county or the entire district of the city. The main issue is the quality of the exposure data, i.e. the number of trips, which are being collected in so many different ways that comparison is quite difficult. Exposure data also often comes from another source than the fatalities data and sometimes is from another year, which makes comparison quite difficult along with the validation of the indicator.

The analysis of the data, when cities provided all the required information, has revealed that the indicator scores vary between 7.87 and 10. Ten cities have an indicator score of 10. Overall cities have a high indicator score which indicates a high traffic safety for active modes.

**Affordability of public transport for the poorest**

This SUMI indicator is defined as the share of the poorest quartile of the population's household budget required to hold public transport (PT) passes (unlimited monthly travel or equivalent) in the urban area of residence. 29 city spreadsheets are available for this indicator, while only two of them were filled in during this study. All the others were prepared by the sampled cities when they cooperated in the SUMI project. Hence, the conclusions do not differ from those reached at the end of the SUMI project.

**Significant data collection barriers were faced by cities** when trying to fill in this spreadsheet. For some cities, data on the average income of the poorest 25% of the population of the urban area was hard to find or not available. Also, the disposal of detailed information related to spending categories broken down either by region or by income quartile is a common problem encountered by several urban areas. Household size does not consider that a child may be travelling at a discounted rate; the same applies for elderly. This has an impact on the affordability score; however, there is no perfect solution to compare the same units – households vs. individuals. In many cities low-income groups benefit from subsidised public transport altogether. The price of the ticket not being the decisive parameter generally undermines the value of this indicator for benchmarking.

The analysis above conducted during the SUMI project can be confirmed. Overall, the return rate from cities during this study was so low that it can be concluded that calculating this indicator is too time-consuming for cities without proper incentives.

The scores for this indicator range from 0 to 10. The average indicator scores across all sampled cities that calculated this indicator is 6.8. Interestingly, the average indicator scores across all sampled cities that calculated this indicator vary drastically by city size. Large metropolitan areas and small urban areas tend to have a high average indicator of above 8. Metropolitan areas have an average closely below 8. Medium-size urban areas, however, have a very low average indicator below 2. Hence, it could be concluded that public transport in medium-size urban areas tends to be less affordable for the poorest group.

**Air pollutant emissions**

This SUMI indicator is defined as air pollutant emissions of all passenger and freight transport modes (exhaust and non-exhaust for PM$_{2.5}$) in the urban area. Spreadsheets from 14 cities are available for this indicator. All these spreadsheets were prepared by the sampled cities when they cooperated in the SUMI project. Hence, the conclusions do not differ from those reached at the end of the SUMI project which are summarised below.

**Significant data collection barriers were faced by cities when trying to fill in this spreadsheet.** This indicator was one of the most difficult to calculate and it was one the ones that required the most time to complete.

The indicator requires a large number of data at a high level of detail (e.g. three categories of buses). Cities that do not have a transport model in place have great
difficulties to obtain data on transport performances (i.e. vkm) otherwise. Scaling and recalibration of existing models (e.g. at regional or national level) are also an issue.

The input data related to the composition of the city’s vehicle fleet is one of the issues for this indicator. It has been underlined by urban areas how data about this aspect is sometimes available, but in most of the cases, it is contained in national or regional databases. The disaggregation of these figures with the purpose of obtaining data at city level is often practically impossible, or, in the best of cases, a high extent of speculation is needed, with obvious consequences on the reliability of data. In case data at city level is not available, using national or regional data would be acceptable for the estimation of the indicator. Moreover, data on vehicle registration, for defining the composition of the urban area’s vehicle fleet, is difficult as cars are not necessarily driving where they are registered. Leased cars may be registered where the leasing company is based which is often in the big cities. Nevertheless, the approximation resulting from this issue seems to be acceptable for the estimation of the indicator, especially because the shares of vehicle fleet composition are considered (not the absolute values).

The analysis above conducted during the SUMI project can be confirmed. As within this study no city calculated this indicator, it can be concluded that calculating this indicator is too time-consuming for cities without proper incentives.

The scores for this indicator range from 5.52 to 9.29. The average indicator score across all sampled cities is 8.

**Accessibility to mobility services**

This SUMI indicator is defined as the share of population with appropriate access to mobility services (public transport). Spreadsheets from 20 cities are available for this indicator, while only two of them were filled in during this study. All the others were prepared by the sampled cities when they cooperated in the SUMI project. Hence, the conclusions do not differ from those reached at the end of the SUMI project which are summarised below.

GIS data and skills are crucial in order to be able to calculate this indicator, which poses a problem especially for smaller cities. In fact, GIS competencies are not always available. This indicator is one of the indicators that has been perceived as not capturing well new (shared) forms of mobility.

The analysis above conducted during the SUMI project can be confirmed. Overall, the return rate from cities was so low that it can be concluded that calculating this indicator is too time-consuming for cities without proper incentives.

The scores for this indicator range from 2.16 to 9.76. The average indicator score across all sampled cities is 8.3. The indicator score calculated by city size confirms that the population in smaller urban areas has a lower access to public transport than in larger urban areas. Overall, the cities that calculated this indicator tend to have a high share of their population with appropriate access to public transport.

**Greenhouse gas emissions**

This SUMI indicator is defined as well-to-wheels greenhouse gas emissions by all urban area passenger and freight transport modes. Spreadsheets from 13 cities are available for this indicator. All these spreadsheets were prepared by the sampled cities when they cooperated in the SUMI project. Hence, the conclusions do not differ from those reached at the end of the SUMI project which are basically the same as for the air pollutant emissions indicator (see above) as for the calculation of both indicators similar data is needed.

Again, as within this study no city calculated this indicator, it can be concluded that calculating this indicator is too time-consuming for cities without proper incentives.
The scores for this indicator range from 0.69 to 8.36. The average indicator score across all sampled cities is 4.3.

**Congestion and delays**

This SUMI indicator captures delays in road traffic and in public transport during peak hours compared to off peak travel (private road traffic) and optimal public transport travel time (public transport). **Spreadsheets from 20 cities are available for this indicator, while only one of them was filled in during this study.** All the others were prepared by the sampled cities when they cooperated in the SUMI project. Hence, the conclusions do not differ from those reached at the end of the SUMI project which are summarised below.

This indicator has been singled out as an example of an indicator that presents **problems of selection bias**: its definition of corridor suffers this shortcoming, as it encourages selective behaviour in the collection of data by the city. When the bus lanes are in both directions, the value of the indicator will depend on the selection bias of choosing the line which is not congested, for example in the morning outbound, and in the evening inbound. There is also some difficulty in tracking the number of people in public transport at peak and at off-peak times.

The exchanges with the cooperating SUMI cities concerning this indicator also raised an interesting issue about diverging interests between urban areas and the European Commission. One of the SUMI partner cities stated that for political reasons they do not collect data related to this indicator. The rationale for this decision was that any empirical corroboration of high levels of congestion might trigger public pressure to extend the road capacity. In its explicit pursuit of a more sustainable mobility system, the city in question wants to avoid this. However, other cities also stated that a certain level of congestion is needed as an argument that there is a need to reduce the number of cars in the city. And also for the EC, measuring congestion is regarded as being of strategic importance as the calculation of this indicator captures necessary information for cities that can help them in targeting infrastructure measures, managing traffic, or analysing mass transit options in view of offering better service and achieving a modal shift.

The analysis conducted during the SUMI project can be confirmed. As within this study only one city calculated this indicator, it can be concluded that calculating this indicator is too time-consuming for cities without proper incentives.

The scores for this indicator range from 2.22 to 10. The average indicator score across all sampled cities is 7.3. The indicator score calculated by city size confirms that smaller urban areas tend to have less congestion and delays in road traffic and public transport than larger urban areas as their average indicator score is higher than the one for larger urban areas.

**Modal split**

This SUMI spreadsheet requests cities to provide modal split data according to different methodologies:

- For passenger mobility:
  - Vehicle kilometres driven;
  - Passenger kilometres driven;
  - Number of trips;
  - Vehicle kilometres per trip driven.
- For freight:
  - Goods vehicles kilometres driven;
- Freight tonnes kilometres driven.
- For shared mobility:
  - Vehicle kilometres driven;
  - Number of trips.

19 spreadsheets from cities are available for this indicator, of which eight were filled in during this study. The 11 others were prepared by the sampled cities when they cooperated in the SUMI project.

Especially for the ‘km’ based definitions it is important that all travellers/ goods transport is included moreover when these data are used in other indicators otherwise only part of the traffic impact is included. In an ideal case, all cities would have a multi-modal transport model synthesising all local data and knowledge on persons and goods movements and providing all the needed modal split data. However, this is not realistic, especially for smaller cities. Therefore, pragmatic but transparent approaches are needed.

The analysis of the available spreadsheets shows which methodologies are used the most by cities. For passenger transport, **79% of the cities provided data according to the number of trips** and **53% of the cities have provided data according to the total amount of vehicle kilometres driven**. **37% of the cities could provide data on the total passenger kilometres driven**. The number of vehicle kilometres per trip is however not a very common methodology used by cities as only **11% could provide such information**.

For freight transport, **47% of the cities have provided data according to the total goods vehicle distance driven**, which is much more than the **16% which provided data according to the total amount of freight tonnes distance driven**.

For shared mobility, **more cities (37%) provided data according to the number of trips** than according to the total of passenger kilometres driven (16%).
4. CHALLENGES, GAPS AND NEEDS IN VIEW OF EU POLICY OBJECTIVES

During the study a number of challenges, gaps and needs have been identified in relation to the four areas of analysis of urban mobility. The challenges, gaps and needs were identified both during the analysis at local level and during the one at national level.

The challenges, gaps and needs identified for each domain are presented in the section below while the concrete recommendations for actions are further elaborated in the recommendations section.

4.1. Challenges, gaps and needs at the local level

4.1.1. Domain A - Sustainable Urban Mobility Planning

Challenges

The development and implementation process of a Sustainable Urban Mobility Plan is an important step towards the achievement of safe, accessible, smart and low-/zero-emission urban mobility. Such an extensive process can present many challenges for a city, metropolitan area, region or Member State. The results of the study show that there is a wide variety of different types of plans which also differ in their quality, scope and ambitions. With the existence of plans from different planning generations, the approach can also vary due to new developments in the field and the revision of the SUMP Guidelines in 2019. Developing a comprehensive plan can be extremely difficult for small urban areas with limited resources while also working on other planning documents and concepts and facing the challenge of integrating these planning processes.

One of the main challenges coming out of the analysis concerns the scope of strategic planning. According to the study’s results in fact, 58% of the cities don’t include the functional urban area in their strategic transport planning. This shows that the focus of planning activities is limited on the administrative city boundaries, following a legal administrative framework. It is clearly a challenge for cities to generally plan beyond the city boundaries, which is one of the main pillars of a good SUMP process. This concerns the functional urban area as a planning focus, but also the TEN-T network for further integration with urban or nodal nodes. The results show that cities and countries have differing understanding of planning scopes and of definitions for region, metropolitan area, and functional urban area. Most cities in the study sample do not strategically plan for mobility beyond their city boundaries, but often still collaborate with other neighbouring authorities and municipalities. This shows that awareness of looking beyond the own city and the benefits of working with other cities is existent and interaction and cooperation in the metropolitan region is taking place but is often hindered by legal frameworks in place. The challenge here is also based in the great differences of city structures – some cities might clearly have a functional urban area to plan for, and some do not. The guide on metropolitan planning also demonstrates that there are different models for collaborative planning in metropolitan regions.\(^{37}\)

Another challenge identified during the study concerns the definition of a general term of “Sustainable Urban Mobility Planning” and “Sustainable Urban Mobility Plans”. A method based on the results of the SUMP self-assessment was used to define if a strategic planning process is compliant with the SUMP concept and its principles. While the SUMP self-assessment tool proved itself as a comprehensive, user-friendly and useful tool for this study, it also revealed the difficulty of comparing different cities to each other. The cities come with various backgrounds and conditions and some would assess themselves in a more self-confident manner than others. Furthermore, the analysis of all

transport plans showed the importance of distinguishing whether a city has a SUMP in place or not. There is still in fact, a great variety of different planning documents in Europe which have different names, processes and purposes. It was shown clearly in the analysis that a process doesn’t need to be stated as “SUMP” to reply to the concept of SUMP itself. Many European cities are working on strategic planning processes for urban mobility, and this isn’t always framed as SUMP. The challenge here is to define what a SUMP is and when a planning process can be stated a SUMP or not. Related to this, the differences in the quality of the plans can also be seen as a challenge. The study sample shows in fact, substantial differences between cities in the quality of their processes and plans. This means that just having a SUMP in place shouldn’t be a goal for itself, as also the content and quality of this process and its plan need to be ensured.

The results of the analysis of **monitoring schemes and related indicators and targets** reveals another challenge. While cities in fact, seem to be fairly good in setting up the monitoring process through the definition of clear targets and indicators for monitoring, there still seems to be room for improvement for a comprehensive approach integrating different types of indicators. Often, only more typical transport activity indicators are considered, while outcome and output indicators are not as common. Furthermore, these indicators seem to be often in place, while no systematic monitoring is finally conducted. This shows challenges in the feasibility and actual implementation of the monitoring schemes of the SUMPs, but also indicates issues in knowledge and capacities as many cities stated that they don’t do any systematic monitoring. For smaller cities especially, monitoring might also be a resources and capacity issue. In the context of these monitoring challenges, an issue that cities are still facing are to keep up the dynamics between SUMP planning generations and to close the cycle between the updated or new plan and the former one. Developing a next generation plan, which is based on monitoring results from the last, is still a challenge for cities but is a crucial step in order to bring lessons learned and new developments into the continuous process of Sustainable Urban Mobility Planning.

**Gaps**

The gaps coming out of the SUMP analysis are very much in line with the challenges that cities are facing. Gaps can be identified in the **monitoring procedures** of the cities (40% of cities don’t have a monitoring scheme in place), indicating a lack of implementation feasibility, awareness of importance of monitoring and/or resources and capacities. This is also supported by the analysis of the state of play at the national level, as the results show that 54% of MS do not appear to have a monitoring system in place for SUMP. In this context, the analysis of used sustainable indicators showed a usage of one-sided **indicator types** which indicates a gap in the usage and availability of commonly used sets of indicators (20% of cities have not defined sustainable indicators for monitoring).

Furthermore, there are also gaps concerning the **planning scopes** of cities, which are related to different needs of the cities, but also gaps in understanding and definitions as well as awareness of larger planning scopes, such as the functional urban area (only 42% of cities with a SUMP, or equivalent plan, in place consider the functional urban area). This issue also relates to other activities in a planning cycle that should take into consideration the area beyond city boundaries, for example for data collection.

Moreover, the study has identified a gap in the use of **different means of communications** to provide information on SUMP; in fact, one of the areas of analysis at the national level was investigating the presence of platforms for SUMP: this included the existence of dedicated websites, social media accounts, newsletters and events and conferences on the topic of SUMP. The analysis has shown that, while dedicated websites for SUMP are common in 68% of MS, 79% of MS do not use social media and 64% have not developed a national newsletter on topics related to SUMP or more in general to urban mobility.
**Needs**

There are a range of needs resulting from the analysis of the status of SUMP and the drawing of conclusions of gaps and challenges for this domain. Based on the elaboration of the challenges of the planning scope, a clear need can be seen for widening the scope of **strategic mobility planning for the whole city area and beyond urban boundaries**. This is linked to a **reconsideration and further research of needs for realistic planning** in this wider planning scope, as the results of the study show that the concept of the FUA as a scope doesn’t seem to be feasible and realistic for many cities. In light of these realities that are unlikely to change, the concept of the planning scope for SUMP therefore needs to be reconsidered and further revised based on research of cities’ needs. Furthermore, this planning scope which goes beyond city boundaries or considers the FUA, needs to be aligned, defined and transport perspectives regarding collective, freight and TEN-T should be added.

The relations between the **FUA, urban nodes and TEN-T** need to be clearer and further integrated into the planning framework (the study shows that only 35% of cities with a SUMP are considering both the TEN-T network and the functional urban area). The study results showed in this context that TEN-T aspects are often considered, but not integrated as much, which indicates a lacking awareness of the relevance of TEN-T. It therefore needs to develop further for cities, what FUA and TEN-T mean for all transport modes and how they can be integrated with each other. Besides the passenger perspective, other perspectives such as collective and freight need further research and integration.

The study, as already introduced in the “challenges” section, also highlighted the need to increase the use of different means of communication when providing information on SUMP; specifically, there should be a greater use of **social media platforms** - which is still uncommon - as they allow for faster, easier communication as well as the creation of a **newsletter** to provide regular content and updates on SUMP to subscribers.

The analysis of the presence and qualities of SUMPs revealed a need for a clear **definition and a harmonisation across Europe of the “SUMP” term**, including the meaning and how SUMPs can be differentiated from other plans, as well as measured and recognized. This also concerns the topic of conditionality. A definition would also be necessary in order to **transfer the concept**, including its principles, to **other strategic planning levels and policy areas** which can be a necessary step for further harmonising and spreading the SUMP concept across Europe (of all identified transport plans, 65% cover the city, 24% cover the FUA and 22% the region or metropolitan area). A transfer to other levels would require a defined set of principles for integration.

In light of the challenges with **monitoring**, there is a need for harmonised provision of guidance for cities how to tackle monitoring and evaluation. This needs a **comparable set of indicators**, which cover aspects beyond measuring transport indicators (80% of cities defined sustainable indicators for monitoring). Some of the cities in the study expressed the concrete need for a harmonised approach of monitoring and using a given set of indicators in their SUMP process (for example Aachen in Germany, who is just working on a new SUMP and is currently working with their own defined set of indicators). Lastly, to ensure monitoring by cities and regions, the possibility of making monitoring mandatory, could also be explored as the analysis at the national level, showed that 71% of MS do not currently have a mandatory monitoring scheme in place.

As it was already elaborated in the “Challenges” section, the challenge and needs of a systematic monitoring are also interlinked with the need for more guidance and research on how to use and see SUMP as a **consistent and continuous planning framework**. Only a minority of cities used the SUMP as a framework for emergency planning (e.g. only 15% for Covid-19 emergency action planning). Planning generations of SUMPs shouldn’t be seen as separate planning cycles, but rather as a permanent process which just continues. To reduce these generation gaps, keep up the dynamics and learn from
the former generation, there is a need for guidance and further concept development on how to use monitoring results from the last generation for the next.

In summary, it shows that there is still further need for clear guidance for cities, especially from the national level. If states and regions work together, this can harmonise the process, encourage municipalities and promote collaboration. Further guidance should also take up the topics of the integration of the functional urban area, TEN-T and monitoring schemes more and offer support in these topics. Especially national or regional support points and working groups are needed here, and adapted guidance and capacity building.

4.1.2. Domain B - Urban Vehicle Access Regulations

Challenges

The key challenges addressing the implementation of UVAR schemes derive first of all from evidence emerging from data collection. Despite the sample of cities is small, at least compared to the huge complexity and extremely diversified European urban areas, the emerging issues are consistent with the findings of the recent studies on the matter.\(^38\)

The identification of foreign vehicles is one among the emerging challenges. Evidence from data collection shows that a heterogeneous pattern of identification is operating in Europe: from the requirement of web site registration to the imposition of stickers. In such a condition, it is likely that this situation creates difficulties in terms of compliance, other than to impose administrative burdens to the municipalities. In such a context, it may happen, that the principle of certainty of the punishment, in case of violation, cannot be guaranteed, leading towards possible discrimination for foreign drivers. Besides, concerning foreign drivers, data collection shows the presence of occasional and non-homogeneous set of informational tools (e.g. web sites or road signs.

The wide variability in the number and types of exemptions represents another challenge. Evidence from data collection shows that there is a wide range of exemptions to the UVAR regulations, considering the specific situations at urban level. Despite a certain degree of flexibility may be justified, it is important that the number of exemptions are held at a minimum, to increase the effectiveness of the regulation.

The justification of the effectiveness and rationale of UVAR schemes is a challenge that is linked to the most controversial nature of the initiative. Restricting vehicle circulation may raise concerns among local businesses, residents and other stakeholders. Setting up and communicating appropriate complementary and alternative transport modes and options, for example, may be a key factor in changing users’ attitudes and ensuring the success of the scheme. Besides, city administrations should give weight and importance to those stakeholders in locations outside the area for which the scheme is planned, as they are among those affected by the introduction of UVARs.

Reinforcing the strategic role of UVAR in urban transport policies and plans is a challenge in part confirmed by the data collection activity. Evidence shows that most of the cities link in some way the UVAR schemes to the strategic plans, i.e. SUMP or air quality plans. However, also in consideration of the fact that from the data collected is difficult to elicit a qualitative evaluation of the linkage between UVAR and urban strategic planning, it should be stressed that the sample of cities showed about 33% of UVARs with no direct linkages to SUMP, which may be bring the conclusion that the relationship between UVAR and strategic planning should be reinforced. In addition, legal measures should play a role by, for example, ensuring the compliance of UVARs with air quality norms and including UVARs in local plans and regulations (e.g. SUMPs).

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\(^{38}\) European Commission, Study on Urban Vehicle Access Regulations - Final report, 2017
**Gaps**

The main gaps derive from the list of challenges. Firstly, concerning the identification of foreign vehicles, one of the main gaps is the lack of access to data on foreign vehicles. Local authorities are not able to always access the necessary (environmental) characteristics of foreign vehicles to check their compliance with UVARs, such as vehicle category, fuel type, emission standard and date of registration. The study shows in fact, that only 43% of UVARs require foreign drivers to register their vehicles on the web site or fill in an application or contact a municipal office, while the remaining 40% informs foreign drivers about UVAR measures through road signs; lastly, 17% does not have a clear regulative framework for foreign vehicles or foreign vehicles are not affected by UVAR measures.

Furthermore, the analysis has identified a gap in the access to information on UVAR on different platforms (i.e. websites, social media, newsletter, events and conferences). The analysis at national level in fact, highlighted this issue as it shows that 86% of MS do not have a newsletter, 68% do not have social media accounts, 89% do not arrange events and conferences on UVAR. The access to reliable and up-to-date information is particularly relevant to foreign visitors, or non-local users in general to make them aware of the rules and regulations of UVAR schemes.

Evidence from data collection has also shown the lack of data on the monitoring and assessment of impacts (e.g. on local economy, quality of life and acceptability) of UVAR schemes. The results of the study shows in fact, that only 50% of UVARs analysed monitor and assess urban emissions (i.e. CO₂, NO₂, PM₁₀, PM₂.5), 2% also monitor the modal share and 12% evaluates other impacts such as congestion and quality of life, but 37% do not monitor or assess any impact. This claim is also supported by the analysis at national level, which shows that 64% of MS do not have a monitoring system in place for UVARs). This practice eventually reduces the knowledge base of the city, other than undermining the communication flow with citizens and stakeholders.

Moreover, the study had identified a gap in the presence of detailed guidelines on UVAR for cities. The analysis at the national level in fact, has identified that, while guidelines are available in 43% of Member States, these guidance documents present several gaps: the analysis has shown in fact, a lack of national work plans with well-defined milestones, measures, objectives for cities and best practices. Specifically, measures to be taken and a national work plan with milestones to be achieved are not present guidelines of 86% of countries, objectives to be achieved by cities in 89% and best practices in 93%.

Another gap that the study identified is the availability of financial support and tools for cities for the development and implementation of UVARs. The analysis at the national level shows in fact, 79% of countries do not have financial and support schemes in place for UVAR, 89% do not offer support and tools when applying for UVAR funding and in 93% funding and support on UVAR is not conditional on implementation of policy.

Lastly, the analysis at Member State level, has also highlighted the lack of technical assistance (e.g. training, advice and consulting services, etc.) in support of municipalities and regions for the development and implementation of UVARs, which is missing in 79% of countries.

**Needs**

Among the necessary needs to overcome the gaps, there is the need to access to foreign vehicles registration databases (only 43% of analysed UVARs requires foreign drivers to register their vehicles on the web site, fill in an application or contact a municipal office). It would be opportune that municipalities could have access to relevant databases, which could be provided by other European countries or database managers. In such a way, the recognition of foreign vehicles and more in general the overall implementation and enforcement of the UVAR schemes would be eased.
Besides, one of the main advantages with having access in general to such databases would also be the support towards the adoption of camera-based control tools for enforcement. This would overcome one of the problems with the use of camera surveillance with ANPR: the need to develop and have access to several databases.

It would be advisable to provide clear and up-to-date information on UVAR through the use of different platforms at national level (i.e. websites, newsletters, social media), especially foreign visitors, or non-local users in order to allow access to high-quality information about the rules and regulations of UVAR schemes. In addition, in order to further educate public institutions, cities, regions, etc. on the topic of UVAR, there is a need for the arrangement of regular events and conferences.

The systematic delivering of monitoring of UVAR schemes and their impacts, as well as the production of evaluation reports, for a better communication of results is another requirement (37% of analysed UVARs do not monitor and assess UVAR impacts).

During data collection it emerged that sometimes, especially for smaller urban areas, the lack of expertise in terms of resources and tools for data collection (e.g. GIS tools) may weaken a regular activity in monitoring and evaluation. In such cases, financial and technical support from the national or EU level, may improve the municipality capacity building. The analysis at the national level has also identified that there is a need for financial and technical support - not only limited to monitoring activities - for the proper development and implementation of the UVAR themselves, especially for smaller urban areas, as described in the “challenges” section.

Another need that emerged from the gaps highlighted during the analysis at the national level are the need to further develop and enrich UVAR guidelines, in order to make them more country-specific, through the inclusion of measures, objectives, national plan with milestones and best practices.

Lastly, there is a need for the better integration of UVAR in long-term strategic plans (in 67% of schemes SUMPs include UVAR measures). In Italy, the national legislation making the preparation and adoption of the SUMP as a pre-condition for the municipality to have access to national funding on transport infrastructure, has been a positive incentive. Similar initiatives, at regional or national level, could be undertaken with reference to the establishment of UVAR schemes and their linkage to strategic urban plans, taking in due consideration of the subsidiarity principle. Legal measures could make mandatory the integration of UVARs in local plans (e.g. SUMPs) and the UVARs compliance with national air quality norms.

4.1.3. Domain C – Sustainable Urban Logistics Planning

Challenges

The development and implementation process of a Sustainable Urban Logistics Plan (SULP) is an important step for city administrations towards achieving safe, accessible, smart and low-/zero-emission urban mobility from the specific perspective of logistics. Logistics activities have however an EU, national or regional scope; city logistics is only a minor stretch of the total transport chain. Therefore, policymaking on logistics activities requires a broader scope, a regional perspective comprising as minimum the Functional Urban Area. Building such an extensive policy approach brings many challenges for a city administration, for a poly-centric area, for a metropolitan area or for a region.

The first challenge concerns the SULP concept, which appears to be much less developed and known, than the concept of SUMP. The results of the study show in fact, that in 32% of sampled cities there is no awareness of the SULP concept, or SULP guidelines, nor do they apply it in their policy making. This is understandable as logistics activities have earlier been one of the less developed elements in the SUMP approach. Only recently, specific SULP guidelines (as one of the SUMP topic guidelines) have been developed. Therefore, this concept is still rather new to city administrations. As the study focused
solely on city administrations, no distinct challenges for metropolitan or polycentric policy levels can be deducted. But in general, city administrations state that a regional perspective in logistics policy making is underdeveloped.

Even though the awareness of SULP is low, 58% of sampled cities several cities have integrated logistics measures in their SUMP. At the same time, only 13% of cities have developed a proper and separate SULP. The logistic measures included in the mobility plans are usually smaller and separate actions plans, research pilots or local subsidy projects are not part of a broader and specific SULP with a plan-do-check-act policy making approach. The results show therefore, that although cities have started a policy making process on logistics activities, which can be considered as a start of the SULP building approach, development of a separate urban logistics plan is a real challenge for cities.

Triggers in this increased attention for a selection of aspects of urban logistics are the development of monitoring and enforcement technologies (e.g. ANPR cameras), which makes it possible to have dedicated policies or zones for urban logistics - making the link with UVAR - and the increased attention for low emission vehicles. Sometimes, this is thus a transition process towards reaching the ambitions for 2030 (e.g. zero emission city logistics in major urban centres). However, often it is a process aiming at increasing road safety, accessibility and (in general) liveability of the urban area. In fact, plans may comprise actions on fostering low emission vehicles (charging of electric vehicles, cargo bikes etc.) and decreasing the external costs of the logistics chain (city hubs, low emission zones, of peak transport) that see, for a limited number of cities, the development of low emissions zone as measures to tackle this.

All cities see a large challenge the collection of data on urban logistics activities. The results of the study in fact, show that only 29% of cities collect this type of data. This was also one of the conclusions from the SUMI project. When cities face challenges in data collection, it is difficult to monitor the effectiveness of SULP policy measures. This also relates to the limited usage of evaluation frameworks and a general lack of measurable targets/indicators for logistics in most cities.

Furthermore, especially for smaller cities, logistics activities are not an essential part of the policy planning process, or policy scope. This is mainly due to the fact of limited capacity in the city (as many do not appoint professionals on logistics policies).

It occurs that cities struggle to consider the wider regional scope for the policy planning framework on logistics activities. This concerns the functional urban area as a wider planning area (even wider than from the passenger perspective) and the TEN-T network for further integration with urban or nodal nodes.

**Gaps**

The first gap relates to the lack of the development of proper SULPs, linked to the challenges described in the previous section. The study showed in fact, that among Member States there is a wide variety of different types of mobility and logistics policy plans. Therefore, it is important to be able to compare the different plans with each other in order to be able to determine the gaps or lessons learned. In addition, while a significant portion of cities (58%) includes logistic measures in their mobility plan, these cannot be categorised as non-SULPs, even though these can still contribute to the sustainable development of mobility and logistics. At the same time, the study’s research identified that several cities have started the process of developing a SULP and that these cities have defined clear ambitions for 2030, relating this to the transition of dedicated zones for urban logistics.

The challenge of considering the functional urban area and the TEN-T network in the planning scope is still a gap; the project Vital Nodes for instance made further steps on the awareness creation of this gap. Likewise, in the case of SUMP, there is a doubt on...
whether cities are not aware enough of these concepts and their relevance or if it is an issue regarding feasibility.

The analysis at the national level on SULP has identified a number of additional gaps. Firstly, it has identified a gap in the access of SULP information on different platforms (i.e. websites, social media, newsletter, events and conferences). The analysis in fact, shows that 82% of MS do not have websites, 89% do not have newsletters, 86% do not have social media accounts and 79% do not arrange events and conferences on SULP. There is also a lack of involvement of politicians and ministries in policies and programmes regarding SULP (not present in 71% of MS).

Furthermore, there is a gap in the presence of guidance on SULP. The analysis at the national level shows that guidelines are available only in 64% of Member States. In addition, the existing guidance documents on SULP present several gaps: 75% of Member States do not include a clear methodology and 82% do not feature a national work plan with milestones, objectives, measures and best practices.

Another gap is the availability of financial and technical support for cities for the development and implementation of SULPs. The study at the national level shows that 82% of MS do not have a financial and support scheme and do not offer support and tools when applying for SULP funding while 82% of countries do not offer technical assistance (e.g. training, advice and consulting services, etc.) in support of municipalities and regions.

The last gap emerging from the analysis at national level, is the scarce presence of laws for SULP, which appear to be missing in 82% of Member States.

Needs

The gaps and challenges described in the previous sections, show that there a number of needs in relation to SULP.

Firstly, there is a need for further awareness of the concept of SULP for cities.

There is also the need to develop and improve guidance documents on SULP. It is important to ensure the availability of clear guidelines, which include measures, objectives, national plan with milestones and best practices. Also, when guidance documents exists, it is necessary to develop them further to make sure that these cover the topics of integration of the functional urban area, TEN-T, data collection, relation between UVAR and urban logistics (one of the most important measures to include), cooperation alongside TEN-T corridors and awareness raising for the integration of local plans with the broader plans for a functional urban area.

The analysis at the national level on SULP has identified a number of additional needs. Firstly, the arrangement of events and conferences for municipalities, public institutions, etc. to create a mindset for SULP. Also, ensuring endorsement of politicians and ministries on SULP. Furthermore, the availability of financial and technical support is important for the development and implementation of SULPs. This is especially relevant to smaller municipalities to ensure that these have sufficient resources and knowledge.

4.1.4. Domain D - Mobility-related data collection and indicators at local level

Challenges

The availability of mobility-related data at the local level and conclusions derived from these data are a precondition for cities to be able to define policies aiming at a more sustainable urban mobility system. While 90% of the sampled cities routinely collect urban mobility-related data, 74% of the sampled cities stated that they do not have available all mobility-related data as they would like to as the data is scattered across
Looking at the data required it can be concluded that **often some important data is not available at all**. There are several reasons for the lack of data envisaged to be collected in this study. **Not all data is available from public sources** and could hence not be found via desk research by consortium members. Also, quite some cities weren’t prepared to invest **adequate time and resources to collect the requested data** (e.g. fill in surveys and indicator spreadsheets), also as they did not receive any financial support. Small cities often do not have sufficient personnel resources to collect data, which not only applies to this study, but to data collection endeavours in general. In addition, the restrictions due to the COVID-19 pandemic had an impact on the possibility to get data as many people work from home and do not have quick and uncomplicated access to databases. Especially several smaller cities also have stated that the **technologies, for example GIS software, for data collection and analysis are often rather complex**, and that the necessary skills are often missing.

As the survey has revealed, **61% of the sampled cities do not have** a central city department responsible for storing the data collected by different city departments and external organisations in a **central database**. Hence the city representatives participating in the study we worked with had to get a hold of colleagues who might have data, which is even more difficult with many people working from home. Generally, due to the COVID-19 pandemic, many city officials have different priorities than providing data for this study. If a city had a high interest in the data themself, e.g. as they are in the process of developing a SUMP, the preparedness to collect and provide data was much higher.

Another challenge is the fact that **quite some data is held by private operators who do not share their data** to protect their competitiveness. Such commercially sensitive data is difficult to receive for many cities, although in some cases regulations exist, e.g. for shared mobility providers who are using the city’s public space.

Finally, it should also be mentioned that **data often is out of date** as it is collected at irregular intervals as data collection activities in some cases are quite costly. The survey has revealed that on the following topics, data is being collected by cities less often than every two years: affordability of public transport, noise annoyance, satisfaction of the quality of public spaces, urban functional diversity, commuting travel time, and modal split. Regarding modal split, 27% of the sampled cities mentioned that they collect data only every 6 to 10 years.

**Gaps**

The main **data gaps for Domain D** are provided for the three different data sources used in this study:

1. Proxy data spreadsheets prepared for this study.

   For two of the spreadsheets, there are evident data gaps:

   - **Access to public transport**: According to the spreadsheet, cities were requested to provide data on the number of inhabitants residing <500 metres from a public transport stop. However, **many cities applied different distance radii around public transport stops**, e.g. 300, 400 or 600-metre radii or even higher radii for certain modes such as BRT or light rail. This is usually the case as cities have their own established methodology, and they simply provided readily available data instead of spending time on adapting to the methodology requested for this study. However, this means that data is theoretically available.
Air pollutant emissions: In order to roughly extract transport related emissions, for this study a methodology has been applied based on "Lenschow P., H.-J. Abraham, K. Kutzner, M. Lutz, J.-D. Preuß, W. Reichenbecher: 2001, Some ideas about the sources of PM10. Atmospheric Environment 35, Supplement No. 1, pp. 23-33" according to which the measured values from measuring stations located in residential areas/ parks are subtracted from those from measuring stations located at busy roads. However, in quite some cities the number of measuring stations is too low for a meaningful calculation. This in some cases even led to negative values for transport-related emissions which could happen if a city for example has only two measuring stations, one at a busy road and one in residential areas, with the latter having higher emission values (e.g. because it is located near a polluting factory).

There are no evident data gaps for the spreadsheets on “Affordability of public transport”. For “Congestion”, “Greenhouse gas emissions” and “Modal Split” data availability is rather good as well, however, as no unified methodology was requested, cities provided data available according to their own – sometimes already established – methodology which puts in question the comparability of data. This is particularly evident for greenhouse gas emission values where there were large differences between the values provided by cities in Germany and by cities in France, while there were only little differences between the values provided by the Dutch cities as there is a national climate monitoring database in place.

2. Original SUMI indicator spreadsheets (only “Road deaths” and “Traffic safety actives modes” obligatory)

Apart from “Road deaths”, data gaps exist for all SUMI indicators. Regarding “Traffic safety active modes”, many cities were not able to provide the data on the number of trips (in million per year) per active mode required for the exposure parameter.

For all the other SUMI indicators, only a very low number of filled-in spreadsheets have been returned by the cities, which indicates that cities did not have the required data readily available and did not have the necessary time and resources to gather the data required to calculate the respective indicators. Particularly, data for the SUMI indicators “air pollutant emissions” and “GHG emissions” are time-consuming to gather, esp. for vehicle fleet composition.

3. Mobility-related data provided by cities in online survey

Shared mobility services: Cities not always have information on the exact number of vehicles available in their city as not always regulations are in place obliging private operators to share these numbers.

Digital public transport tickets: Hardly any cities were able to provide information on the percentage of trips undertaken with digital tickets in relation to the total number of all trips. The reason for this could be that the city did not have the data at hand and did not take the time to request it from the public transport operators providing services in the city. However, it can also be an indication that (esp. private) operators are reluctant to share this information.

Active parking management: Cities were asked to provide data on the impact on the number of cars and/ or congestion in the city since the introduction of parking management instrument(s). From the low number of cities that replied to this question it can be assumed that many cities are not aware of the impact of the parking policies on the number of cars and/ or congestion in the city, or it was too time-consuming to provide an answer to this question. A few cities stated that they do not (yet) evaluate the impact.

Mobility-as-a-Service (MaaS): The link between the MaaS to any mobility planning objective of the city is usually rather general, i.e. that MaaS should contribute to a shift to sustainable modes. None of the sampled cities measures the impacts of the MaaS options on the modal split.

For all other data collected on the topics above there are no evident data gaps, i.e. data availability is rather good. This can also be stated in general on the following
topics covered in this survey: “clean public transport” and “retrieval of data from mobility operators and mobility platforms”.

Needs

Based on the analysis of the data available, it is quite evident that many cities struggle with providing some of the data as requested in this study. Key problems are scarce personnel and financial resources. Hence, **funding to support data collection activities**, be it from the national or EU level, would improve the level of data availability. Funding could be used to finance personnel costs related to data gathering (e.g. through a data acquisition funding scheme provided via the SUMI website\(^{39}\)) or, in case data sets still need to be generated, for purchasing for example GIS software, emissions measuring devices, or external services to conduct surveys.

Also, **capacity building activities**, such as **training** for generating, processing and storing specific data (e.g. use of GIS or comprehensive data storage/ sharing tools), would be a support mechanism that would be welcomed by many cities, esp. smaller cities.

From a European perspective, and in order to achieve comparability of data from different cities, it would be beneficial to have **harmonised European or at least national regulations on mobility data standards**, e.g. which data needs to be collected/ provided to European or national bodies at which intervals, methodologies for collecting data and calculating certain indicators, etc. Requirements for cities to provide certain data to European or national bodies according to a specific methodology would also ensure that staff resources would have to be made available by city administrations to gather such data. Regarding the SUMI indicators, one city stated that if it were agreed at EU level that these indicators would become **the** indicator set to be used by European cities, this would be welcomed, as it would support the monitoring of the city’s SUMP. However, some preparatory activities would be needed for setting up the data collection frameworks in order to be able to calculate the indicators in a reasonable amount of time at a regular basis.

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\(^{39}\) [https://ec.europa.eu/transport/themes/urban/urban_mobility/sumi_en](https://ec.europa.eu/transport/themes/urban/urban_mobility/sumi_en)
5. CONCLUSIONS

This chapter provides the overall conclusions and recommendations of this fact-finding study. They have been derived from the findings presented in the previous sections and divided between overarching policy recommendations regarding the urban mobility topics studied (the analysis has revealed that there are several patterns in common among study’ domains and for which general recommendations can be provided.

More specifically, based on the analyses carried and on the existing recommendations from previous projects, a list of recommendations were developed for each domain with the aim of answering the Commission’s question: "What support (instruments: legal/financial) should cities receive to achieve safe, accessible, affordable, smart, and low and zero-emissions urban mobility?"

For this reason, recommendations have been divided in: general, related to all study domains, specific, related to each domain in particular.

5.1. General conclusions and recommendations

This chapter presents the conclusion and recommendations that are common and relevant for all study domains.

- There is a need for standardised definitions as study domains (especially SUMP, UVAR and SULP) may be characterized by a variety of approaches and have sometimes different interpretations and scope.

The analysis has revealed that study’ domains (especially SUMP, UVAR and SULP) may be characterized by a variety of approaches and have sometimes different interpretations and scope, also when it comes to the set of minimum criteria that would define a specific policy. Standardisation of definitions would be a crucial step towards conditionality of funding, comparison of policies and the creation of a consistent monitoring framework at EU level.

**Related recommendations:**

There should be a common language and an aligned set of definitions for urban mobility concepts (e.g. SUMP, UVAR, SULP, etc.) that lead to a uniform and collective perception of those concepts and enable their comparison, monitoring and provision of more accurate guidance and resources.

- Policies by domain are interlinked but there is room for improvement, especially concerning the integration of UVAR and SUMP or regarding EU and national policy.

The results of the study indicate that there is a rather good integration of different plans and policies, with however room for improvement especially concerning the integration of UVAR and SUMP or regarding climate and energy planning. Moreover, it seems that it should be strengthened the link between EU targets and urban mobility policies.

**Related recommendations:**

The urban mobility policies should interlink and converge towards the achievement of the shared objectives of the European policies (e.g. CO₂-free city logistic, carbon neutrality, etc.).
• Data collection practices are diversified across the EU and there are scarce incentives for the collection of such data, which are relevant for monitoring the performances of urban mobility policies.

The analysis has revealed that data collection practices are diversified across the EU and there are scarce incentives for the collection of such data which are relevant for monitoring the performances of urban mobility policies.

**Related recommendations:**

A consistent set of data standards should be defined at the European level (e.g. data typologies, frequency, calculation methods, etc.) and Member States should be incentivized in collecting and submitting urban-mobility-related data on a regular basis.

• Due to a lack of data, monitoring and evaluation practices on urban mobility policies are somehow scarce and the use of digital tools to ease such a process is still limited.

The analysis has revealed that, also because of the lack of data, monitoring and evaluation practices on urban mobility policies are somehow scarce and that the use of digital tools to ease such a process is still limited.

**Related recommendations:**

Urban mobility data standardisation and collection should be fostered and possibly channelled into public digital platforms that in time allows the creation of business intelligence for the public administration that can lead to the development of better future policies.

• Local authorities, especially smaller cities, do not always have capacities to develop effective urban mobility policies, due to lack of resources, capacities and knowledge of processes.

The study results have shown that local authorities, especially those of smaller cities, do not always have the financial and technical capacities that would allow them to develop effective urban mobility policies. This might be due to smaller resources, but also less capacities and knowledge of the process as well this might be an indicator that some urban mobility concepts (especially SUMP) may not be matching the smaller cities needs and the feasibility of implementation.

**Related recommendations:**

- Local authorities should be provided with continued and enhanced financial and technical support (e.g. capacity building, guidance, information sharing, collaboration and cooperation) to allow the development of effective urban mobility measures.
- Specific consideration of different city sizes in standardised definition, conditionality approaches and quality assessment should be paid.

5.2. **Specific conclusions and recommendations on each study domain**

This chapter presents the conclusion and recommendations that are domain specific.
5.2.1. Domain A – Sustainable Urban Mobility Planning

As a conclusion of the status of Sustainable Urban Mobility Planning across Europe, SUMP can be seen a mainstream concept that reaches cities of all sizes and of different countries. SUMP will support urban areas to contribute to reaching European climate goals. In order to continue this success, promote further the concept and improve the quality of SUMP processes. Of course, it is always recommended to continuously support cities on national (and regional) level, meaning (adapted, translated) guidance, integration of SUMP into national strategic policy documents, funding, national support points, capacity building programmes, learning resources etc.

- Many cities struggle with a planning scope beyond the city boundaries. The functional urban area as a concept is not a realistic approach for all European cities and therefore needs adaptation and flexibility for different context as well as a better integration with the TEN-T network.

An integral part of the SUMP concept is the consideration of the functional urban area, which appears to be a concept that is not feasible for most of the cities. With the individual context of every city and its different needs and differing definitions of spatial scopes, there cannot be a “one size fits all” approach, but the concept should be adapted according to realistic expectations and feasibility. With rethinking the planning scope for SUMP, the broader transport perspective of the FUA should be considered, meaning an integration of all modes and a focus to freight, logistics and collective transport. This can also increase the understanding and awareness of the FUA as a planning scope.

**Related recommendations:**

- Further work, research and promotion of the FUA as an important dimension of transport planning. The focus should be on functional regional cooperation rather than on a clear definition of the geographic scope. For improving and consolidating regional cooperation, cities need support and guidance for feasible cooperation models beyond the city boundaries. This should also entail the relation with urban nodes and a focus on the broader transport perspective such as long-distance transport.
- Support and financially incentivize strategic planning for regional cooperation in planning.
- Funding tied to planning processes considering the wider planning scope.
- Guidance would be helpful on how to link SULPs and SUMPs or how both planning concepts could be integrated, or which aspects could even be harmonised.
- Capacity building, awareness building and support for cities on planning as a city being part of the TEN-T network.

- The variety of planning approaches across Europe and the differences of quality show a need for a standardised definition of SUMP, also with view to conditionality.

The variety of approaches across Europe and the differences in the quality of the plans calls for a standardised definition of the SUMP concept. This doesn't just include a definition of the general meaning, but also the definition of minimum criteria that defines a transport plan as a SUMP. The creation of a standardised definition would be a crucial step towards conditionality and European funding tied to SUMP, which needs a clear understanding of what defines a high-quality SUMP and when to call a SUMP a SUMP. The results of the quality and compliance analysis indicate some discrepancies between the given concept and the actual implementation and feasibility, which could for example be improved through the realistic adaptation of the planning scope.

For further take-up, development and up-scaling of SUMP, the SUMP principles should be adapted and established to other planning levels. The SUMP principles can serve as a generally helpful guidance for any planning topic area, e.g. all climate-related policy
fields. The principles and the uptake of a (modified) cycle would also contribute to the urgently required integration of policies (e.g. in a comprehensive climate plan).

**Related recommendations:**

- Clearer operational definition of SUMP (along SUMP self-assessment) and minimum (relative\(^\text{40}\)) planning targets as an addition to the SUMP Guidelines.
- Minimum criteria for content should be defined: e.g. concrete and measurable contribution to Green Deal targets, integrated coverage of all policy fields mentioned in the Annex A (and the SUMP guidelines), minimum relative improvement levels on SUMI indicators, planning scope, resilience aspects etc.
- If concepts for conditionality or dependent funding are developed, the condition should go beyond the pure existence of the plan as this doesn't ensure the implementation of actions and the quality of the plan. Therefore, the above-mentioned points regarding minimum criteria or targets/definition of SUMP should be considered in this context.
- Building up on a standardised definition of SUMP, the idea of SUMP certification on European or national level could be further explored.
- Establishment and adaptation of SUMP planning principles for other policy areas and planning levels and setting of principles for integration.

**The results of the study indicate that the integration of specific but highly relevant policy fields, such as climate or road safety, need further integration and consideration in SUMP planning processes.**

The results of the study indicate a rather good integration of different plans and policies, with room for improvement, for example regarding climate and energy planning. For the integration of different planning processes with SUMP, the SUMP should always be seen as the master document, while other transport related policy plans such as the SULP should be seen as a specialised plan that should be integrated well with the SUMP. In any way, all policy fields need to be integrated in the whole process, e.g. through visioning, target setting, measure packages etc.

**Related recommendations:**

- Research on needs and city support for integrating or considering policy fields within SUMP processes, for example with view to urban logistics, road safety or climate.
- Integration of SUMP into national strategic policy documents.
- Capacity building and support for how to interlink policies and potential criterion for standardised SUMP definition.

**SUMP should be promoted and established as a consistent planning framework for long-term resilient planning, also as an answer to crises (especially view with to COVID-19 pandemic and climate crisis). Monitoring should be an integral part of this.**

A SUMP should not be seen as the aim of a process, but rather as one component of a continuous planning cycle. The SUMP document is a way of summarising and formalising this process, but of course it doesn't end with its adoption. The implementation and the monitoring of implementation are some of the biggest challenges of the whole process and need more clarity and attention. As a consistent planning framework, the cycle never ends and monitoring and evaluation results from the former process should be taken into the next cycle or the update of the plan. Generation gaps between plans need to be

\(^{40}\) Relative in the sense of "relative improvements, not absolute target values".
reduced and dynamics should be kept up, especially concerning monitoring and the progress towards the defined targets. The analysis showed a large amount of first generation plans from before 2015, which might receive an update in the next coming years. With view to monitoring, the study results indicate the need for capacity building, support and clearly defined indicators for systematic monitoring schemes. The results of the study indicate great differences in abilities for systematic monitoring and lack of capacities, awareness of the relevance as well as resources. Furthermore, the results suggest a rather one-sided way of monitoring progress with not considering different types of indicators.

Furthermore, the need for a resilient planning framework is undeniable and the study results present impressively what a great impact COVID-19 had on the implementation of mobility measures. Short-term reactions but also long-term planning need a consistent framework, including an emergency action plan and a scheme which doesn’t exclude monitoring and data collection in times of crises. With regard to present and future challenges such as the climate crisis, natural hazards, terror attacks or similar events there is a strong need to further bring the concepts of SUMP and resilience together.

**Related recommendations:**

- Funding/financial incentives, promotion and support for SUMP updates and next generation SUMPs.
- More guidance and clarity for cities on how to close the gap between planning generations; Capacity building and support on national level for appropriate monitoring.
- Support and capacity building on systematic monitoring to improve the next generation SUMPs and consider lessons learned from the former planning cycle.
- Provision of adapted guidance on monitoring, targeted to different types of contexts, such as smaller cities.
- Making monitoring based on a given set of European indicators a criterion for the definition as a SUMP and with view to conditionality and funding.
- Promotion, support and capacity building for resilient urban mobility planning, integration of resilience principles into SUMPs and to link resilience plans with SUMPs.
- Making the link between SUMP and emergency action plans, climate change adaptation plans and resilience plans. This will require further research and work on how to link these topics and encourage cities to take up the topic of resilience.
- Making resilience planning, including measures towards the climate crisis, a minimum criteria or condition in the standardised definition of SUMP (towards conditionality).
- Further development, promotion and establishment of a harmonised and standardised set of urban mobility indicators for monitoring progress.

- **While the SUMP concept has proven to be successful in many different city types, the differences between regions and city sizes shows a need of contextualisation of the concept, for example for smaller cities.**

The study results have shown that smaller cities show larger gaps in the quality of their processes and the compliance with the SUMP principles. There is generally a higher level of compliance in larger cities. On the one hand, this might be due to smaller resources, but also less capacities and knowledge of the process. On the other hand, this might be an indicator for the concept not matching the smaller cities needs and the feasibility of implementation.

**Related recommendations:**
Capacity building targeted to smaller cities. As an adapted guidance for smaller cities, the topic guide published in 2021 is a start for providing specialised support.

- Funding and support programmes targeted to small cities.
- Specific consideration of different city sizes in standardised definition, conditionality approaches and quality assessment (e.g. SUMP self-assessment).
- Further contextualisation of the concept to different situations, for example regarding region, national context, city size.

### 5.2.2. Domain B - Urban Vehicle Access Regulations

As a conclusion of the status of Urban Vehicle Access Regulation schemes across Europe, it is important to mention their importance in the overall management of urban mobility. Low Emission Zones, congestion charges areas, pedestrian zones, areas with limited circulation for specific types of vehicles, etc., are nowadays integral part of the urban mobility regulation and are deemed to further increase their role in the near future. The UVAR schemes reflect the heterogenic structure of the urban fabric of European cities: for example, regulating vehicles circulation to protect historical sites, curbing congestion in big cities and preserving cycling and walking in small and compact cities. The fact-finding study suggests developing a shortlist of actions that can improve UVAR effectiveness, leading at the same time towards a better harmonisation at EU level. The actions range from technical solutions (e.g. digitalisation of enforcement and access to foreign vehicles registration database) to changes in the UVAR design as reducing types and number of exemptions, and ensuring the solidity of the policy framework, as a systematic monitoring & evaluation (communication with stakeholders) and a better integration in local strategic plan (air quality plan, SUMP).

- **The identification and enforcement of foreign vehicles represents a challenge: facilitating the access to foreign vehicle registration data may be the solution.**

Data collection has shown that the identification of foreign vehicles is one among the emerging challenges. Evidence from data collection shows that a heterogeneous pattern of identification is operating in Europe: from the requirement of web site registration to the imposition of stickers. In such a condition, it is likely that this situation creates difficulties in terms of compliance, other than to impose administrative burdens to the municipalities. In such a context, it may happen that the principle of certainty of the punishment, in case of violation, cannot be guaranteed, leading towards possible discrimination for foreign drivers. Besides, concerning foreign drivers, data collection has shown the presence of occasional and non-homogeneous set of informational tools (e.g. web sites or road signs).

**Related recommendations:**

- The set-up of a common European standard procedure (a consistent legal and technical base) allowing municipalities to
  - have access to foreign vehicle database (e.g. including environmental characteristics of the vehicle to check its compliance with the UVAR scheme);
  - to solve technical problems of database harmonisation.

- Favouring the cooperation and coordination of Member States (with relevant cross-border movements), funding pilot cases and demonstrators.

- **Improving monitoring and evaluation activities as the systematic delivering of monitoring and evaluation reports for a better communication of results has been unsatisfactory.**
The systematic delivering of monitoring and evaluation reports for a better communication of results has proved to be lacking. Evaluation of any UVAR scheme is essential to determine whether it has met its objectives, helping to refine and improve scheme delivery and to provide evidence for continuing support of the scheme. Evaluation and monitoring not only allows to assess the effectiveness of the UVAR scheme but it also helps to determine whether the chosen type of UVAR scheme is appropriate for the city development, whether there are any issues with its implementation and support and whether there are any ongoing concerns and potential conflicts that need to be resolved when implementing the scheme. The evaluation process has then to be designed in such a way that it is able to identify the detail of any changes needed to optimise the UVAR scheme over time. Moreover, it emerged that sometimes, particularly for the smallest cities, the lack of expertise in terms of tools for data collection, e.g. GIS tools, or monitoring may weaken a regular activity in monitoring and evaluation.

**Related recommendations:**

- Supporting initiatives, both financial and technical, from the national or EU level, to improve the municipality capacity building.
- Favouring the dissemination of best practices.

- **A high number of exemptions may weaken UVAR effectiveness, making control more difficult. Finding the trade-off between the number of UVAR exemptions and UVAR effectiveness is a pre-condition for an effective regulation.**

There seem to be a wide range of exemptions to the UVAR regulations, considering the specific situations at urban level. Despite a certain degree of flexibility may be justified, the number of exemptions should be held at a minimum, to increase the effectiveness of the regulation. Then, a key issue for UVAR implementation is the clear definition of exempted vehicles. Every scheme is likely to entail exemptions under specific circumstances, such as ambulances, vehicles driven by or for persons with reduced mobility, etc. Therefore, it is essential to have unambiguous, reliable vehicle identification and exemption rules that should be similar across Europe in order to allow smooth cross-border travel for citizens and business.

**Related recommendations:**

- Favouring the dissemination of best practices on the wide range of exemptions in use for UVAR regulations, considering the specific situations at urban level.

- **Reinforcing the UVAR inclusion in strategic plans is a key issue in strategic local planning, both local and European added value, given that the effectiveness of any kind of UVAR schemes depends on such a link.**

The inclusion of UVAR schemes in strategic local planning is a key issue given that the effectiveness of any kind of UVAR schemes depends on such a link. The common reference to Sustainable Urban Mobility Plans would be of great benefit to cities aiming at sustainable mobility and compliance with the air quality legislation by implementing a UVAR scheme. Evidence shows that most of the cities link in some way the UVAR schemes to the strategic plans, i.e. SUMP or air quality plans. However, also in consideration of the fact that from the data collected is difficult to elicit a qualitative evaluation of the linkage between UVAR and urban strategic planning, it should be stressed that the sample of cities showed about 30% of cities with no direct linkages to SUMP, which may be conducive to conclude that the relationship between UVAR and strategic planning should be reinforced.

**Related recommendations:**
In national initiatives, provide conditional national/regional funding and support to the inclusion of UVAR in strategic local plans. In addition, legal measures should play a role by, for example, ensuring the compliance of UVARs with air quality norms and including UVARs in local plans and regulations (e.g. SUMP).

Favouring the dissemination of best practices.

- **The progressive shifting to the use of digital tools (camera, sensors) in UVAR enforcement is conducive towards better data collection and higher compliance rates.**

Two key approaches are available to ensure UVAR enforcement: manual or digital. Local police or traffic wardens carry out the manual control, sometimes with the support of sticker systems applied to the vehicles. Camera and ANPR (Automatic Number Plate Recognition) systems perform the UVAR surveillance in case of the application of digital techniques. A combination of the two may be also considered. The choice between the two approaches depends on several factors, e.g. the trade-off between implementation costs (higher in the digital tools) and easiness of implementation (in case of manual tools). However, there are several reasons supporting the progressive shifting towards the adoption of digital tools. Firstly, it is important to stress that automatic or digital approaches ensure in principle a better compliance rate. Making enforcement effective is fundamental for both schemes, given that weak/ineffective enforcement will lead to the failure of even the best-conceived scheme. Secondly, one of the main advantages with having access in general to databases would also be the improvement of the knowledge base of the municipality (for example detecting traffic flows). In conclusions, national and European initiatives should support the UVAR enforcement through digital tools.

**Related recommendations:**

- National/regional initiatives favouring the access to national vehicle databases: harmonisation of information.
- Financial and technical support from national and EU level in technologies, and training.

5.2.3. **Domain C – Sustainable Urban Logistics Planning**

As a conclusion of the status of urban logistics policy-making, including via SULPs, it can be said that in order to reach the objectives of the Sustainable and Smart Mobility Strategy related to city logistics, European cities should increase the focus on urban logistics during all the stages of their urban mobility planning process. Currently, only a small selection of Member States can be defined as “frontrunners” or “early adopters” in terms of the development and implementation of SULPs. To allow an increase in the uptake of SULP guidance on logistics policymaking and an improvement of policies, it is necessary to enable data collection, monitoring and evaluation of frameworks, knowledge building and capacity building on SULP.

- **Non-binding guidance on the inclusion of urban logistics aspects in urban mobility planning processes is available (e.g. for building SULPs) at European level. However, only a limited number of cities are aware of this guidance and even less applies logistics principles in their urban mobility planning approaches**

The analysis has shown that the concept "SUMP" is more developed and known than SULP. A considerable number of cities in the study are not aware of the concept "SULP" and of its guidelines, nor do they apply it in their policymaking. More specifically, 68% of cities in the study are aware of the existence of the European guidelines on SULP, which were recently developed. As the concept "SULP" is still rather new for cities in fact, several of these do not use SULP guidelines yet. It is important to mention that, as the analysis on this aspect in the study is limited to the local level, no distinct challenges for
metropolitan or poly-centric policy levels can be deducted. However, in general city administrations state that regional perspective in logistics policymaking is underdeveloped.

**Related recommendations:**

- Translate results of the different living labs (e.g. ‘City Logistics in Living Laboratories – CITY LAB’, or ‘Towards a Shared European Logistics Intelligent Information Space – SELIS’) on logistics policy making into practical guidance.
- Provide support on the understanding of logistics segments and their impacts on policy objectives. Although the current policy focus is strongly on e-commerce, logistics is made of different segments that may have a different impact in each city. Cities should understand which segment has the most impact, so that expertise and capacity can be effectively put in place.

**Technical capacity on urban logistics policymaking at the city level is scarce due to a lack of expertise and/or appointed professionals**

National authorities play a key role in the development of technical capacity as well as in the setting of targets; the latter is particularly important, as cities need to be aware of the relation between logistics and sustainability objectives for mobility and urban logistics, specifically the White Paper objective on CO2-free city logistics by 2030.

**Related recommendations:**

- Increase EU support for capacity building in the area of urban logistics policymaking (e.g. the inclusion of logistics elements in planning processes as well as the provision of training for both civil servants working for local and national authorities).
  - National authorities should be encouraged to set frameworks, and regional objectives for sustainable city logistics. The goal should be to focus on including logistics aspects in the planning process in a way to allow the reaching of the objectives set. National authorities should empower regional and local authorities by fitting their local perspective in a wider approach, as logistics activities are organised on a global, regional and local scale.
  - EC might start this discussion by establishing a working group, within DG MOVE, with national authorities.
  - Support might also be found through knowledge exchange between early adopters and frontrunners, and/or between followers.
  - The planning concept should be adaptable to local and regional situations. The "SULP" concept should not be a goal in itself but should act as guidance for planning processes.
- Integration of logistics in planning processes might be a prerequisite for access to cohesion funds and CEF funding.
- Support capacity building: the capacity in the city is a prerequisite for effective implementation of SULP.
- Need for EU support for poly-centric areas, multi-scale nodes, integration of scales. There is a need to increase the attention regarding spatial planning in and outside the city, the functional area and the relation with long distance networks given their role of stakeholder in a multi-scale area, where urban nodes are particularly relevant. Also, poly-centric areas play an important role (and not only metropolitan areas). Indeed, cooperation between cities organised via poly-centric areas raises the capacity of smaller cities. For these reasons, national authorities (which set priorities of funding) should empower local and regional authorities to organised poly-centric approaches and across Member State borders.
There is a close relation between setting SMART-objectives, indicators, and the need for data collection / monitoring.

It can be concluded from the analysis, that if cities set clear objectives, it is possible, through the collection of data, to monitor the effectiveness of policies on urban logistics. In fact, collecting data on urban logistics activities without having clear policy objectives is a missed opportunity. In addition, the analysis shows that it is necessary to set objectives in order to be able to allocate funding effectively. And – one step further – objectives are best set together with stakeholders in the functional urban area, in order to create acceptance, especially when objectives consider the TEN-T network.

Related recommendations:

- Increase EU support to improve the interaction between stakeholders in the urban logistics supply chain and policy makers, including the involvement of private stakeholders, such as shipping and logistics companies.
- Financial incentives could create the ground for the developments of sustainable business cases by logistics operators and cargo owners. Public-private partnerships can be shaped to pilot different approaches.
- Increase EU support for data collection on urban logistics, and on the setting of indicators.

5.2.4. Domain D - Mobility-related data collection and indicators at local level

Looking at the status of mobility-related data collection and indicators at the local level in European cities based on the analysis of the information and data collected in this study, it can be concluded that many cities struggle with getting a hold of sufficient mobility related data for a comprehensive data-based overview of the current mobility situation in the city, at least based on data as requested in this study.

In order to tackle this, city authorities must have competent staff to collect, compile and analyse data, and sufficient budget for collecting and/ or purchasing data. In addition, a certain degree of harmonisation of data collection approaches and calculation methodologies in cities would have a positive impact on the comparability and usability of data sets from cities across Europe, as a sound basis for evidence-based policy making at the national and European level.

While a lot of mobility related data could be gathered at the local level on the topics addressed in this study, there are quite some data gaps, esp. related to the calculation of sustainable urban mobility indicators.

Based on the analysis of the data available, it is quite evident that many cities struggle with getting a hold of the mobility related data as requested in this study. A major challenge mentioned by the sampled cities is the fact that a lot of data is held by many different departments, agencies, companies, etc. and that it is difficult to compile this data in one place. Two other data collection related challenges were mentioned by at least half of the sampled cities: lack of staff numbers to collect, compile and analyse data, and costs related to the collection of purchase of data. This points quite clearly to the key problem which is scarce personnel and financial resources. In addition, in several cities, esp. smaller cities, there is a lack of competences for generating, processing and storing mobility related data.

Related recommendations:

Financial: Provision of funding to support data collection activities from the national or EU level to improve the level of data availability. More specifically,
- funding to finance personnel costs related to data gathering, e.g. via data acquisition funds that cities can apply for (similar to the fund provided by the SUMI project);
- funding for software (GIS, Transport Model), hardware (e.g. emissions measuring devices), or services (agencies conducting surveys).

Capacity building: Provision of training offers on generating, processing and storing mobility related data (e.g. use of GIS or comprehensive data storage tools, or data sharing possibilities incl. open data platforms), esp. for smaller cities.

- **Most European cities have in place data collection routines and many have developed indicators (often related to their SUMP) and related calculation methodologies; differences in approaches makes comparability of data difficult.**

As the study revealed, 90% of the sampled cities routinely collect urban mobility-related data at the local level. For this, cities have defined the data sets that are being collected, at which intervals it is being collected, and certain formats are in place in which this data is being stored. In many cases, data is structured and stored in excel spreadsheets. These routines have been developed by city administrations over many years, leading to a large variety of approaches and methodologies, esp. when it comes to indicators that cities have developed, often with regard to measuring the impact of mobility measures included in the city’s SUMP.

A classic example is how a city calculates the modal split: there are differences regarding the methodology (based on the number of trips, on the total amount of vehicle kilometres driven, on total passenger kilometres driven or on vehicle kilometres per trip), the subdivision of modes (next to the most commonly used categories car, public transport, cycling and walking, quite some cities differentiate between car as driver or passenger, or split Public Transport into bus, metro and train, or have additional categories such as motorbike, taxi or boat), the type of trip (work or leisure), and whether and how freight transport, shared modes or intramodality are taken into account.

Also, for all types of sustainable urban mobility indicators there are many different approaches on how a specific indicator can be calculated. For example, for the calculation of the percentage of the population with appropriate access to public transport, the cities sampled in this study have often used other distance radii around PT stops than the requested 500m, as many cities have established routines to calculate this indicator based on e.g. 300m, 400m or 600m or are even using different radii for different PT modes, e.g. higher distances for BRT stops.

**Related recommendations:**

- Provision of harmonised standards for mobility-related data at the European level, e.g. which data needs to be collected/ provided to national or European bodies at which intervals.
- Obligation for cities to collect specific data and to calculate certain mobility-related indicators according to a unified methodology, and to report these to national or EU bodies.
- To reduce the additional requirements for cities, some data could be collected by national or European bodies such as national statistics institutes or Eurostat.
6. ANNEX

6.1. Annex A: Indicator sheets - Domain A (Sustainable Urban Mobility Planning)
Annex attached to this report separately.

6.2. Annex B: Indicator sheets - Domain B (UVAR)
Annex attached to this report separately.

6.3. Annex C: Indicator sheets - Domain C (Sustainable Urban Logistics Planning)
Annex attached to this report separately.

6.4. Annex D: Indicator sheets - Domain D (Mobility-related data collection and indicators at local level)
Annex attached to this report separately.

6.5. Annex E: MS sheets
Annex attached to this report separately.

6.6. Annex F: Indicator sheets - Correlations (Mobility-related data collection and indicators at local level)
Annex attached to this report separately.

6.7. Annex G: Survey templates
Annex attached to this report separately.

6.8. Annex H: List of contacted cities
Annex attached to this report separately.

6.9. Annex I: Number of urban mobility plans or sump in place per member state
Annex attached to this report separately.
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