European Platform on Sustainable Urban Mobility Plans

TOPIC GUIDE

SAFE USE OF MICROMOBILITY DEVICES IN URBAN AREAS

Imprint

About:
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Topic Guide: Safe use of micromobility devices in urban areas

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Guide to the reader

This document provides guidance on how to integrate micromobility in urban mobility planning, with the goal to achieve a safer use of micromobility devices in urban areas. More specifically, it focuses on the use and planning for shared electrically powered personal mobility devices, such as electronic kick scooters (e-scooters), hoverboards, monowheels in an urban context. It includes all those vehicles that fall under the European Standard EN 17128:2020[1].

The document does not address bicycles, electric power assisted cycles (EPACs), speed-EPACs[2] and cargo bikes used for commercial urban logistics. These have an established set of technical regulations at the EU level, as well as road rules and infrastructure quality design standards that are freely available in many European Member States and are the subject of other Sustainable Urban Mobility Plan (SUMP) guidance documents on the Eltis website[3]. However, they will necessarily be referred to in this document since it is likely that micromobility devices may be required to share the infrastructure with them.

The governance processes required by cities for the management and deployment of micromobility devices are significantly different between Electronic Kick Scooters, other micromobility devices and the bicycle/EPAC sector. The need for this document largely comes from the wide-spread and rapid deployment of large, shared e-scooter fleets in urban environments. In all the other categories of micromobility devices and bicycles/EPACs, the majority of the deployed vehicles are in private ownership, which cannot be governed by fleet managers (operators). Shared e-scooter devices are governed by city authorities in terms of local policies for infrastructure, speed, access restrictions, parking and enforcement, but may also be governed by national and emerging EU regulations on manufacture and use.

Therefore governance procedures discussed in this document are primarily a guide for the management of shared e-scooter fleet deployments. There is some valuable cross reference to the development of public bike sharing, but public bike sharing has existed in a variety of forms since the 1960s and has a wide range of approaches and business models which do not apply to scooters.

This Topic Guide applies the concept of SUMP, as outlined by the European Commission's Urban Mobility Package[4] and described in detail in the European SUMP Guidelines (second edition)[5]. Sustainable Urban Mobility Planning is a strategic and integrated approach to dealing with the complexity of urban transport. Its core goal is to improve accessibility and quality of life by achieving a shift towards sustainable mobility. SUMP advocates fact-based decision-making guided by a long-term vision for sustainable mobility. It requires a thorough assessment of the current situation and future trends, a common vision with strategic objectives, and an integrated set of regulatory, promotional, financial, technical and infrastructural measures. Implementing these measures to deliver the objectives should also be accompanied by reliable monitoring and evaluation. In contrast to traditional planning approaches, SUMP particularly emphasises the involvement and cooperation across different levels of government, with citizens, stakeholders, and private stakeholders. Further emphasis should also be placed on the coordination of policies between sectors (such as transport, land use, environment, economic development, social policy, health, safety and energy).

This document is part of a compendium of EU guidance documents, complementing the revised second edition of the SUMP Guidelines. They elaborate on difficult planning aspects in more detail, provide guidance for specific contexts or focus on important policy fields. Two types of SUMP guidance documents are available at the EU level. While 'Topic Guides' provide comprehensive planning recommendations on established topics, 'Practitioner Briefings' are less elaborate documents addressing emerging topics with a higher level of uncertainty. So far, guidance documents have been published on how to address the following topics in a SUMP process:

- planning process: participation, monitoring and evaluation, institutional cooperation, measure selection, action planning, funding and financing, and procurement;
- contexts: metropolitan regions, polycentric regions, smaller cities and national support;
- policy fields: safety, health, Sustainable Energy and Climate Action Plans (SECAPs), logistics, walking, cycling, parking, shared mobility, Mobility as a Service, intelligent transport systems, electrification, access regulations, automation, resilience, social impact assessment, and gender and vulnerable groups.

They are part of a growing knowledge database that will be regularly updated with new guidance contexts. The latest documents are always available in the 'Mobility Plans' section of Eltis (*www.eltis.org*), the European Commission's urban mobility observatory.

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1 *https://standards.cencenelec.eu/dyn/www/f?p=CEN:110:0::::FSP_PROJECT,FSP_ORG_ID:40453,616722&cs=11FC0D30F70E6A174AC666F43DD506062*

2 Bicycle defined as that which falls under ISO standard 4210, EPAC as that vehicle that falls under CEN standard EN15194, and Speed Pedelec as that vehicle falling under L1-eB type approval

3 *https://www.eltis.org/mobility-plans/topic-guides*

4 Annex 1 of COM(2013) 91.

5 Rupprecht Consult (editor), Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan, Second Edition, 2019

Executive summary

This Topic Guide proposes best practice and key recommendations on the integration of micromobility devices in urban mobility planning, with the goal to achieve their safer use in urban areas. It focuses on shared electrically powered personal mobility devices such as e-scooters. It will also provide some guidance on how the users of these vehicles interact with the users of bicycles and electric power assisted cycles (EPACs), as well as pedestrians and other road users.

The Topic Guide also provides recommendations on integrating micromobility into the Vision Zero approach[6] to mobility and planning, which aims to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. It highlights the need to urgently integrate e-scooters into cities' Sustainable Urban Mobility Plans (SUMPs), as bicycles and EPACs already tend to be, but also into Vision Zero Safety Plans and other relevant plans such as urban development plans.

More specifically, the Topic Guide addresses the different stages of the planning process: cities should first understand the role they want micromobility to play in their transport system. Then they should choose a method to control the access to their market, and see where it is applicable. In a third stage, they should define how to regulate operations and to enforce these. Local and regional authorities should also assess how they can integrate the micromobility offer with the other shared mobility offers of the city.

The Topic Guide then proposes recommendations on how the safe use of e-scooter micromobility devices relates to the eight SUMP principles. It goes on to introduce the main actions and elements essential for implementing the safe use of these devices, reflecting the phases of the SUMP cycle.

In a fast-evolving urban transport environment, micromobility is changing how some people move around the city; especially young people who are willing to test and use these new transport solutions. It brings along new and urgent challenges such as operational issues that relate to safety, use of public space, traffic management and others, for local and regional authorities, urban planners and national decision-makers. Despite getting off to a sometimes rocky start,

the deployment of shared e-scooter fleets may encourage city leaders and micromobility providers to work hand-in-hand to forge a way ahead that serves the public good, meets city goals such as a modal shift towards more sustainable modes of transport, and enables the private sector to create viable business models. Micromobility should also be seen as a lever for cities to make multimodal travel more attractive.

The crux of the micromobility challenge could lie in finding the right equilibrium that serves the needs of cities and citizens, while ensuring that the legitimate interests of service providers can be respected. Getting there will require planning mobility differently, with relationships built on trust among all parties. Like many other emerging mobility issues, there is no single formula that cities and urban planners can apply equally everywhere. But by working through the issues now, learning from new data and adapting urban mobility processes, cities can learn and be better prepared when the next mobility innovations come on to the scene, such as autonomous vehicles moving people and goods. One thing is sure: while there is an expanding role of the private sector in mobility service provision, public interest must lead, and cities must be in the driver's seat.

The Topic Guide draws on the results from the research of the first CIVITAS ELEVATE Policy Support Group between June and December 2021.

[6] *https://visionzerochallenge.org/vision-zero*

Key safety-related recommendations

1. Apply Vision Zero to micromobility and ensure coherence between SUMPs and Vision Zero Safety Plans.
2. Start with some urgent measures directly ('quick wins'):
   - if separate cycling infrastructure is insufficient to accommodate additional vehicles, create additional space for micromobility quickly by offering pop-up cycle lanes, which can also be used by micromobility devices;
   - provide adequate parking space for micromobility devices to avoid parking on footpaths;
   - inform potential users about the national and local rules for the use of these vehicles (such as running a campaign on the safe use of micromobility) and try to cooperate with providers (such as attaching information to the vehicles).
3. Create protected infrastructure for micromobility users and pedestrians (for example, segregated spaces and traffic calming measures). Footpaths are the preserve of the pedestrian, where they should feel safe.
4. Apply speed management solutions (such as traffic management, enforcement and lower speed limits) where cyclists and micromobility devices share roads with motor vehicles. Higher speeds and/or high density of traffic would require some form of separation. The higher the speed and the more dense the motor vehicle traffic, the greater the degree of separation should be.
5. Allow only micromobility devices with maximum motorised cut off speeds of 25 kph to share infrastructure with cyclists. Appropriate speeds, safer road use and improved trauma care all have the capacity to reduce the probability and impact of crashes.
6. Treat the drivers of micromobility devices who are under the influence of drugs and alcohol in the same way that drivers of other motor vehicles are.
7. Ensure pricing mechanisms of operators of shared micromobility fleets do not encourage riders to take risks. Changing the pricing mechanism from per minute to per km would have an added value to overall safety.
8. Develop new expertise and build capacity to manage data (for example, on micromobility vehicle trips and crashes).
9. Engage with vulnerable road users, including pedestrians and existing micromobility users, to understand their concerns before schemes are introduced.
10. Design micromobility training for micromobility and road users, including diverse and disadvantaged groups, informing about risks and rules. It is important to educate road users in general on how to keep micromobility riders safe. Wearing a helmet should be part of recommendations to micromobility users and be included in any visuals to set a good example for users.
11. The European institutions and standardisation bodies should also agree on the classification and safety standards for the micromobility devices themselves.

Key recommendations on planning for the safe use of micromobility devices in urban areas

1. Assess your transport situation and set a clear modal shift goal towards greater use of more sustainable modes of transport.
2. See micromobility as an opportunity for deploying a new governance framework and use current developments in travel behaviour, as experienced in response to the coronavirus (COVID-19) pandemic, to pilot integrative transport services.
3. Lead the integration process and develop close working relationships with private operators committed to integrating services (such as transport operators).
4. Initiate collective dialogue with key stakeholders in the form of a stakeholders committee.
5. If you choose to regulate, consider the most appropriate regulatory model. In the case of tendered processes to select providers of shared micromobility, use carefully designed tender procedures. Ensure you cover all important specifications and that these help you reach your city goals. For example:
   - seek clarification from operators on the whole 'life cycle' emissions associated with the batteries, carbon footprint, certifications and the wider circular economy principles;
   - require operators to remove vehicles that are improperly parked or damaged, or are left in areas that are difficult to access.
6. Introduce intermodal mobility stations next to public transport stations and parking spots dedicated to e-scooters, bicycles and EPACs, such as 'e-hubs' that include charging facilities.
7. Favour solutions for fixed docking that include electric charging of docked vehicles to help operations.
8. Use data from micromobility providers as a support to urban planning: it can serve city goals and complement other modes. Where possible, differentiate between e-scooters and bicycle/EPAC data.
9. Focus on expanded accessibility and better social inclusion.
10. Identify key performance indicators (KPIs) to effectively monitor and manage new mobility services.
11. Establish clear criteria and procedures for enforcement mechanisms.

Role of users, service providers and authorities in providing a safe use of micromobility devices in urban areas

Users

- Check the current local rules/laws on the use of micromobility vehicles (before your first ride) – they vary even within Europe and might have changed even after your last trip.
- Get informed via the apps of sharing providers. Usually they include information on rules and give safety related hints (such as details about parking and which spaces can be used).
- Especially for shared devices: Check the device before you start your ride: Do the lights and brakes work? Where is the bell? Is the vehicle equipped with indicators and, if so, how do they work? Is there a helmet in a box you can use?
- For shared bicycles, adjust the height of the saddle.
- Familiarise yourself with the device you are about to use in a safe space before you use it during rush hour on a main road. Try to brake, make a turn at low speed, indicate that you want to turn. Take your time until you feel safe enough to start your actual ride.
- Wear sturdy shoes and stand on an e-scooter one foot placed in front of the other for more stability.
- Use one vehicle per person and do not use e-scooters as transport vehicles for your baggage (for example, no suitcases on the footboard and no bags placed on the handlebar)
- Consider using your own helmet for rides on shared vehicles if none is provided.
- Do not use your phone during a ride. Place it in a phone holder, which is often attached to the handlebar. Stop your ride whenever you need to use your phone.
- Do not drive/ride a micromobility device if under the influence of alcohol or drugs.
- Show consideration for other road users and pedestrians. Do not get too close and let faster vehicles overtake you.
- Park your vehicle in a stable position so that it cannot fall over. Make sure the device is not blocking footpaths, cycle lanes, entrances, rescue routes or any markings for people with a disability (for example, tactile elements or contrasting surfaces).

Service providers

- Contact city authorities before you start offering shared devices in a new city to discuss potential requirements (memoranda of understanding, tender procedures and use of data).
- Define a contact person city officials can approach and provide a contact on the devices themselves for urgent requests.
- Define non-parking zones together with city authorities where it is impossible to end a ride.
- Approach local providers of public transport and discuss cooperation to increase multimodality.
- Include information on country-specific rules concerning the use of shared devices in your app (such as no riding on footpaths and use cycle lanes).
- Provide further safety-related information in the app (for example, only one person per scooter, suggest wearing a helmet, show how to park, and do not drink and ride).
- Incentivise:
  - correct parking (such as mandatory uploading of a photo of the parked scooter before ending the ride);
  - wearing a helmet (for example, offer helmets in a box on the scooter and provide a discount for uploading a selfie with rider wearing the helmet);
  - driving soberly (such as offer a reaction test when the app is opened in the evening/at night before rental starts).
- Offer a beginner mode which can be activated before the ride and which limits the maximum speed to a lower level than the one required by the country's legislation.
- Consider pricing options which do not incentivise speeding .

Authorities

National/regional level (depending on competences)**:**

- Prepare legislation on micromobility devices (for example, classification of devices, speed limits similar to bicycles, insurance and not to be used on footpaths).
- Inform potential users about the national/local rules for the use of these devices (such as running a campaign on the safe use of micromobility) and trying to cooperate with providers (such as attaching information to the devices).

City level:

- Discuss agreements with providers or start tender procedures if possible that should include requirements such as road safety, non-parking zones, multimodality, range for numbers of devices and limited duration of the agreement.
- Prepare a SUMP and include a strategy on micromobility devices.
- Start some urgent measures directly by:
  - creating additional space for micromobility quickly by offering pop-up bike lanes that can also be used by micromobility devices;
  - providing parking space for micromobility devices by re-allocating parking space used for cars to keep footpaths free for pedestrians;
  - informing potential users about the national/local rules for the use of these devices (such as running a campaign on the safe use of micromobility) and trying to cooperate with providers (such as attaching information to the devices.

1. Introduction

1.1 Objectives of this Topic Guide

The main objective of the Topic Guide is to provide planning recommendations and best practice for stakeholders involved in urban planning on the topic of the safe use of 'shared electrically powered personal mobility devices such as e-scooters, in an urban context. This Topic Guide focuses on road safety and how to address micromobility in the Sustainable Urban Mobility Plan (SUMP) planning and implementation process. In this Topic Guide we also make the link with the Vision Zero approach and how micromobility can be integrated into it.

The document also aims to provide general guidance on how to integrate micromobility into all eight principles of sustainable urban mobility planning and implementation. Good practice examples and key recommendations are also an important component of this guidance material.

The primary target audience for this Topic Guide are public authority planners and practitioners from various levels of government from local/city level to regional, national and European, with a broad variation in their level of expertise in relation to mobility and planning.

This Topic Guide is part of the additional EU guidance linked to the revised SUMP Guidelines[7]. It also supports the European Commission to deliver on Action 22 of the Sustainable and Smart Mobility Strategy[8], focusing on the safe use of micromobility devices in urban areas.

1.2 What we mean by micromobility

The term micromobility is associated with a rapidly evolving range of light vehicles that are increasingly deployed on streets across the globe. In most markets today, micromobility means privately owned or shared e-scooters – docked and dockless. However, a variety of new devices and designs emerging in the near future might stretch the definition of micromobility.

For the purposes of this document a micromobility device is a vehicle as defined through CEN standard EN 17128:2020[9]. Bicycles (as defined through ISO 4210) are not new micromobility devices, and electric power assisted cycles (EPACs), as defined through EN15194, though newer than bicycles, are very similar to bicycles so that they can be treated in almost the same way. For cycling devices, there is a long history of infrastructure, road rules and planning knowledge. They are fundamentally different vehicles to micromobility devices. They also have different safety requirements, as the wheel size and frame design may require different infrastructure considerations. Bicycles and EPACs will be referred to in this document since it is likely that micromobility devices may be required to

[7] *https://www.eltis.org/mobility-plans/sump-guidelines*

[8] *https://ec.europa.eu/transport/themes/mobilitystrategy_en*

[9] *https://standards.cencenelec.eu/dyn/www/f?p=CEN:110:0::::FSP_PROJECT,FSP_ORG_ID:40453,616722&cs=11FC0D30F70E6A174AC666F43DD506062*

share the infrastructure with them, though as mentioned before, bicycles have their own SUMP guidance document[10] and a plethora of guides on infrastructure development, road rules and management[11].

Micromobility devices can be privately owned or available through a shared fleet. Shared micromobility services make micromobility devices available for shared use to individuals on a short-term basis for a price or free. Most challenges linked to micromobility in urban areas, such as chaotic parking and traffic safety, relate to shared mobility services that are commercially operated, namely private operators providing free-floating e-scooters in cities.

Micromobility is seen as a potential solution to moving people more efficiently around cities, when replacing trips done with individual conventional cars. These services have clearly resonated with consumers, as demonstrated by their rapid adoption over just the last several years. They have the potential to better connect people with public transport, reduce reliance on private car use, hence supporting a modal shift. It is important to point out that cities have to grow an alternative portfolio to private car ownership by supporting the growth of alternative modes. E-scooters are very useful in this regard, as they go beyond acting as supplement to public transport systems. Most micromobility devices are also considered to have a lower environmental impact than private conventional cars, with little noise and zero tailpipe emissions. Their light weight could also mean a smaller carbon footprint over the vehicle life cycle compared to other types of motorised vehicles.

However, a recent report from the International Transport Forum (ITF)[12] found that the carbon dioxide (CO_2) emissions per km of e-scooters was significantly worse than many other modes, including internal combustion engine (ICE) buses and trains. This imbalance is mainly due to the operations around micromobility devices.

Like any new entrants into a long-established system, many of these services have faced resistance and growing pains, including for urban planners, resulting in sometimes tense relationships between local governments and e-scooter providers. The popularity of micromobility devices was perhaps unforeseen, but is well illustrated by the expansion of shared e-scooter companies and a considerable take up of privately owned e-scooters, and seems to be here to stay.

1.3 Discussing micromobility in the context of SUMPs

Today, most urban planners tend to agree that urban transport systems need to be reimagined. Though bicycles and, more recently, EPACs have proven over many years to be a recognised healthy and environmentally sustainable alternative to motorised vehicles, other micromobility devices, which favour small, flexible modes of transport, are turning into a popular new alternative to private cars for first and last mile trips[13]. Micromobility can also solve several urban problems at once (such as tackling congestion). Just as importantly, the data obtained from micromobility solutions can help urban planners to improve the city for all.

In this context, cities around Europe are coming up with a wide range of planning strategies to meet their residents' transport needs. Having found themselves inundated with this unanticipated new mobility option, cities have experimented with a variety of approaches. Nevertheless, it appears that most cities do not integrate micromobility in their SUMPs yet. This Topic Guide aims to support cities in this new and challenging exercise, where cities need to make space for smaller modes and regulate them to use micromobility to achieve road safety, sustainability and other urban policy objectives.

[10] *https://www.eltis.org/sites/default/files/urban_road_safety_and_active_travel_in_sumps.pd_.pdf*, *https://www.eltis.org/sites/default/files/supporting_and_encouraging_cycling_in_sumps.pdf*

[11] *https://bicycleinfrastructuremanuals.com*

[12] International Transport Forum: Donkey Republic Bike-Share – Sustainability Framework: *https://www.itf-oecd.org/file/51926/download?token=8MylC6fy*

[13] *https://www.itdp.org/2018/12/14/e-scooters-last-mile-solution/*

2. Recommendations for safer micromobility in cities

The table below details the key recommendations for the safe use of micromobility devices in cities, presenting information on what, how, by whom and how these recommendations should be implemented.

Detailed safety-related recommendations				
	What should be done	**How it should be done**	**By whom should it be done**	**How it should be monitored**
1. Apply Vision Zero to micromobility and ensure coherence between SUMPs and Vision Zero Safety Plans.	Updated SUMPs and safety plans.	Cities and Member States have to update the SUMPs and safety plans. Micromobility should be an essential part of the plans.	Cities and Member States.	The number of updated SUMPs and plans.
2. Start with some urgent measures directly ('quick wins'): **• if separate cycling infrastructure is insufficient to accommodate additional vehicles, create additional space for micromobility quickly by offering pop-up cycle lanes, which can also be used by micromobility devices;** **• provide adequate parking space for micromobility devices to avoid parking on footpaths;** **• inform potential users about the national and local rules for the use of these vehicles (such as running a campaign on the safe use of micromobility and trying to cooperate with providers (such as attaching information to the vehicles).**	Infrastructure measures: pop-up cycle lanes and parking space for micromobility vehicles. Campaigns, information material to the vehicles.	Cities have to plan and build the measures. Cities, operators, schools, driving schools and other traffic safety organisations have to organise campaigns and design information material. Operators have to attach information material to the vehicles.	Cities, operators, schools, driving schools, and other organisations.	The number of measures implemented The number of campaigns. Information material has been attached to the vehicles.
3. Create protected infrastructure for micromobility users and pedestrians (for example, segregated spaces and traffic calming measures). Footpaths are the preserve of the pedestrian, where they should feel safe.	Traffic planning guidelines.	Cities and states have to make traffic planning guidelines that take micromobility into account. Micromobility must be a traffic mode that is taken into account in all traffic planning.	Cities, Member States.	The number of updated guidelines.
4. Apply speed management solutions (such as traffic management, enforcement and lower speed limits) where cyclists and micromobility devices share roads with motor vehicles. Higher speeds and/or high density of traffic would require some form of separation. The higher the speed and the more dense the motor vehicle traffic, the greater the degree of separation should be.	Speed limit plans, traffic calming measures, enforcement plans. Infrastructure for cycling/ micromobility.	Cities and Member States have to update the speed limits, plan traffic calming measures and plan the network for micromobility routes. The police have to enforce micromobility rules.	Cities, Member States, the police.	The length of streets with changed speed limits. The number of traffic calming measures implemented. Network plan for micromobility is made in cities. Enforcement plan is done.

Detailed safety-related recommendations				
	What should be done	**How it should be done**	**By whom should it be done**	**How it should be monitored**
5. Allow only micromobility devices with maximum motorised cut off speeds of 25 kph to share infrastructure with cyclists. Appropriate speeds, safer road users and improved trauma care all have the capacity to reduce the probability and impact of crashes.	Classification for micromobility devices with different maximum motorised cut off speeds. The legislation needs to be up to date.	European institutions and standards agencies. Member States	Cities and Member States.	Classification is done. Legislation is updated.
6. Treat the drivers of micromobility devices who are under the influence of drugs or alcohol in the same way that drivers of other motor vehicles are.	Legislation must be updated. Enforcement for micromobility drivers.	Member States have to update legislation related to drugs and alcohol and micromobility use. Police have to enforce micromobility driving.	Member States, the police.	Legislation is updated. The amount of enforcement.
7. Ensure pricing mechanisms of operators of shared micromobility fleets do not encourage riders to take risks. Changing the pricing mechanism from per minute to per km would have an added value to overall safety.	Changes to pricing mechanism.	Operators should change the pricing mechanism. Cities should require that pricing mechanism if possible.	Operators, cities.	Pricing mechanism (per km) is introduced.
8. Develop new expertise and build capacity to manage data (for example, on micromobility vehicle trips and crashes).	Collect and analyse data.	Cities, police, hospitals, operators and others have to co-operate with collecting the data.	Cities, police, hospitals, operators and others.	Traffic studies.
9. Engage with vulnerable road users, including pedestrians, before schemes are introduced to understand their concerns.	Seek feedback from vulnerable road users and offer possibility to influence.	Cities and operators should organise consultation and offer feedback channels.	Cities, operators.	The amount of feedback, the number of changes made due to feedback.
10. Design micromobility training for micromobility and road users, including diverse and disadvantaged groups, informing about risks and rules. It is important to educate road users in general on how to keep micromobility riders safe. Wearing a helmet should be part of recommendations to micromobility users and be included in any visuals to set a good example for users.	Micromobility training and awareness campaigns.	Cities, operators, schools, driving schools, disability organisations and other traffic safety organisations have to organise and offer trainings and campaigns.	Cities, operators, schools, driving schools, disability organisations and others.	The number of people that have taken part in trainings, the number of campaigns.
11. The European institutions and standardisation bodies should also agree on the classification and safety standards for the micromobility devices themselves.	Classification and safety standards for the micromobility devices.	The classification and safety standards should be updated regularly when new devices come to market.	The European institutions and standardisation bodies.	The classification and safety standards have been done. The updating process has been introduced.

Detailed recommendations on planning for the safe use of micromobility devices in urban areas				
	What should be done	**How should it be done**	**By whom should it be done**	**How it should be monitored**
1. Assess your transport situation and set a clear objective to increase the use of more sustainable modes of transport.	Traffic research, SUMP update if necessary.	Cities have to undertake traffic research and update their SUMP if necessary.	Cities.	Traffic studies.
2. See micromobility as an opportunity for deploying a new governance framework and use changes in travel behaviour, as experienced in response to the coronavirus (COVID-19) pandemic, to pilot integrative transport services.	Suitable infrastructure, legislation, permissions, services. Negotiations, cooperation.	Cities have to plan and build suitable infrastructure. Member States have to enact laws, cities have to give permissions for the services, operators have to offer services. Cities have to be active with new modes of micromobility and organise cooperation.	Cities, states, operators.	Traffic studies.
3. Lead the integration process and develop close working relationships with private operators committed to integrating services (such as with transport operators).	Launching and developing collaborative models.	Cooperation meetings will be organised, measures will be planned and responsibilities will be shared between the different parties.	Cities, private operators, transport operators and other service providers.	The integration process has been started.
4. Initiate collective dialogue with key stakeholders, especially micromobility operators, in the form of a stakeholders committee.	Collaborative group.	Member Sates/cities have to start a collaborative group with all important stakeholders.	Cities, Member States, operators, police and others.	Collaborative group follows all important gauges.
5. Consider the most appropriate regulatory model and adequately regulate market access. If you choose to regulate, consider the most appropriate regulatory model. In the case of tendered processes (such as single or multiple tendered franchise) to select providers of shared micromobility, use carefully designed tender procedures. Ensure you cover all important specifications and that these help you reach your city goals. For example: • **seek clarification from operators on the whole 'life cycle' emissions associated with the batteries, carbon footprint, certifications and the wider circular economy principles;** • **require operators to remove vehicles that are improperly parked or damaged, or are left in areas that are difficult to access.**	Cities should assess the best regulatory model for their local needs and take action accordingly.	Cities should decide internally which regulatory model and tools to choose. In case of tendering process, cities should design the procedure and requirements carefully.	Cities (not possible in all countries due to national legislation).	Data collection and traffic studies.

Detailed recommendations on planning for the safe use of micromobility devices in urban areas				
	What should be done	**How should it be done**	**By whom should it be done**	**How it should be monitored**
6. Introduce intermodal mobility stations next to public transport stations and parking spots dedicated to e-scooters, bicycles and EPACs (such as 'e-hubs' that include charging facilities).	Intermodal mobility stations.	Cities, public transport organisations, operators, and micromobility operators should introduce intermodal mobility stations next to most important spots.	Cities, public transport organisations and operators, micromobility operators.	The number of installed intermodal mobility stations.
7. Favour solutions for fixed docking that include electric charging of docked vehicles to help operations.	Fixed docking stations.	Cities, micromobility operators and private companies (for example, shopping centres) should introduce fixed docking stations next to the busiest spots.	Cities, micromobility operators and private companies.	The number of installed fixed docking stations.
8. Use data from micromobility providers as a support to urban planning: it can serve city goals and complement other modes. When possible, differentiate between e-scooters and bicycle/EPAC data.	Collect and analyse data.	Cities have to collect and analyse data. Data can be collected by cities' own studies or from operators.	Cities, operators.	Data collection and traffic studies.
9. Focus on expanded accessibility and better social inclusion.	Ask feedback from citizens and offer chance to influence.	Cities and operators have to organise queries and offer feedback channels.	Cities, operators.	The amount of feedback, number of changes made due to feedback.
10. Identify key performance indicators (KPIs) for effective monitoring and management of new mobility services.	Identify KPIs.	Cities have to plan the KPIs.	Cities.	By KPIs.
11. Establish clear criteria and procedures for enforcement mechanisms.	Enforcement plan.	Police, cities and operators have to make a plan of how to enforce driving and parking.	Police, cities, operators.	The number of traffic violations.

3. Integrating micromobility into Vision Zero

3.1 What we mean by Vision Zero

This chapter suggests how to integrate micromobility into the Vision Zero approach[14] and proposes avenues to get there. The EU has set the long-term goal to reach zero deaths by 2050 – also called 'Vision Zero'. Through the endorsement of the Valletta Declaration on road safety of March 2017 in Council conclusions[15], EU transport ministers called for a target for reducing serious injuries – namely, to halve the number of serious injuries in the EU by 2030 with a 2019 baseline and a renewal of the target to halve deaths for the new decade.

To move towards these goals, a new approach is set out in the 'Europe on the Move' Communication[16] and enshrined in the EU Road Safety Strategy 2021-2030[17]: first of all, the mindset of 'Vision Zero' needs to take hold more than it has so far – among policy makers, urban planners and society at large. Secondly, the 'Safe System'[18] approach, supporting Vision Zero, needs to be implemented across the EU. The core elements of the Safe System approach are: ensuring safe vehicles, safe infrastructure, safe road use (speed management, sober driving, wearing safety belts and helmet use encouraged) and better post-crash care. Thirdly, cities have to be ready to confront new trends, such as connectivity and automation, but also micromobility. When properly implemented (in terms of safe infrastructure and traffic calming measures), micromobility can contribute to delivering Vision Zero, with the goal of zero fatalities and serious injuries – at EU, national and local levels. This suggests a wider scope of Vision Zero, in which micromobility has a key role to play.

Several urban and mobility plans and schemes already provide tools to help achieve better mobility planning and Vision Zero: these include tools relating to cycling and walking, which may also be useful to consider when dealing with micromobility devices. Many of these tools have regulatory power or at least hold a strong influence over decision-making.

SUMPs, as explained in detail in the following chapters, are the most obvious ones, but many others exist (for example, schemes to restrict urban vehicle access or to create Low Emission Zones; strategic development plans for public transport, parking or cycling; and public space improvement programmes). As a rule, micromobility should be systematically integrated into these plans, as a priority into SUMPs, even though it is also important that these are seen as distinct vehicles with their own solutions and challenges.

3.2 Zero fatalities and serious injuries

The premise of the Vision Zero strategy is that road deaths and serious injuries are unacceptable and preventable. The European Commission Transport White Paper 2011[19] includes 'interim road safety targets' such as halving road deaths and serious injuries by 50% by 2030, which should help reach Vision Zero. To achieve this vision, the use of micromobility devices needs to be made safer in cities, thanks to better planning and governance. Measures need to be adopted to manage the risks that users of micromobility devices face and pose.

[14] European Commission (2011), White Paper *'Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system'* ,COM(2011) 144 final

[15] *https://data.consilium.europa.eu/doc/document/ST-9994-2017-INIT/en/pdf*

[16] *https://ec.europa.eu/transport/modes/road/news/2017-05-31-europe-on-the-move_en*

[17] EU Road Safety Policy Framework 2021-2030 - Next steps towards 'Vision Zero': *https://op.europa.eu/en/publication-detail/-/publication/d7ee4b58-4bc5-11ea-8aa5-01aa75ed71a1*

[18] *https://2018.itf-oecd.org/road-safety.html*

[19] *https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0144:FIN:EN:PDF*

Planning instruments

When planning for micromobility, urban planners need to envisage how e-scooter safety is being considered under their SUMP and, when available, under their Vision Zero Safety Plan in their city. Vision Zero Safety plans are efficient tools to prepare for the safe deployment and operation of e-scooters in cities and have already been adopted by many cities around the globe[20].

In doing so, the reference should be the Safe System approach[21], which argues that the traffic system should be designed in such a way that it is adapted to people who often make mistakes which is why the system must be inherently safe. Safer vehicles, safer road infrastructure, appropriate speeds, safer road users and improved trauma care all have the capacity to reduce the probability and impact of crashes. Taken together, these elements should form layers of protection that ensure that, if one element fails, another one will compensate to prevent injuries and fatalities. This approach requires multi-sectoral action and management by objectives, including timed targets, clear responsibilities of all actors involved and performance tracking.

Safety impacts of e-scooters in cities should be carefully analysed, especially when considering plans and permits for shared e-scooter fleets - this includes where they interact with cyclists on cycling infrastructure, which can often be already crowded with cyclists. Cities and providers should partner to ensure safe riding of e-scooters and re-design streets to provide safe places to ride e-scooters. The benefits of adapting the infrastructure will be beneficial for many other groups of users.

Rapid increase in Vulnerable Road Users

Micromobility brings along a new challenge: how can authorities ensure that micromobility users and pedestrians will not become crash victims? For e-scooters and their services, it is recommended to focus on the first mile (such as suburban areas) and the last mile. For example, moving around main transport hubs can be considered as unsafe.

Between January 2018 and August 2020, at least 11 deaths have been linked to e-scooters in cities across Europe, while Paris is experiencing between 150 and 200 e-scooter-related injuries every month[22]. Poor road surface conditions, speed, alcohol, drugs, inexperienced

users, limited helmet use, unclear road rules and poor road markings are largely blamed.

If the use of cycling, walking and micromobility devices could be increased, it is likely that this would very much lessen the risk to all road users given the smaller size and less energy in the transport system.

Infrastructure, urban space and parking management

Most cities across Europe recognise the need to reduce the numbers and use of motorised private cars. Walking, cycling, micromobility and public/shared transport are those modes that are now preferred. However, since public space is limited, to promote these modes of transport and improve their safe use, it is necessary to allocate adequate space to support the use of more sustainable modes of transport. There is an important link to be made with general speed management strategies. For example, lane space for cars operating at 30 kph is less than lane space for cars operating at higher speeds – so-called 'road-diets' always comprise a speed management element to free up space.

[20] For an example, see London Vision Zero Safety Plan: *http://content.tfl.gov.uk/vision-zero-action-plan.pdf*

[21] *https://www.oecd.org/publications/zero-road-deaths-and-serious-injuries-9789282108055-en.htm*

[22] *https://www.eltis.org/resources/case-studies/rise-micromobility*

[23] ITF/OECD Safe Micromobility report (February 2020): *https://www.itf-oecd.org/safe-micromobility*

As the experiences of European cities during the coronavirus (COVID-19) pandemic have shown, more cyclists and e-scooter users require better and safer infrastructure, where necessary separated from motorised vehicles such as cars and trucks, and broad enough to allow overtaking manoeuvres among cyclists and users of micromobility devices. Protected space is also one of the recommendations from the ITF/ Organisation for Economic Co-operation and Development (OECD) report[23] on micromobility safety, which offers the following 10 recommendations for policy makers, city planners, operators and manufacturers:

1. Allocate protected space for micromobility.
2. Make micromobility safe, focus on motor vehicles.
3. Regulate low-speed micro-vehicles as bicycles.
4. Collect data on micro-vehicle trips and crashes.
5. Proactively manage the safety performance of street networks.
6. Include micromobility in training for road users.
7. Tackle drunk driving and speeding across all vehicle types.
8. Eliminate incentives for micromobility riders to speed.
9. Improve micro-vehicle design.
10. Reduce wider risks associated with shared micromobility operations.

The best way of incorporating safe micromobility devices into the cities will probably be through allowing micromobility to use the cycling infrastructure, increase and improve that infrastructure to cater for the increase in use, and introduce traffic calming measures. One of the most effective measures a city can implement to improve safety of micromobility and encourage the use of micromobility devices is creating segregated infrastructure. Protected cycle lanes would make riders of micromobility devices feel safer and more welcome.

There is a great deal of literature and examples on when and how to separate micromobility from motorised transport. The basic principles include separating when motorised traffic is too fast or too dense for bicycles or e-scooters to share the roads with them. The degree of separation and nature of the barrier also changes with higher speeds and more dense traffic. It is recommended that separation begins at 30 kph. By 50 kph and higher, the separation should come with a physical barrier between the motorised vehicles and the bicycle/ micromobility traffic[24]. Parking spaces for private use and, particularly, those from rental services should also be established for micromobility devices.

An important question to ask is how can micromobility devices such as e-scooters share the cycling

[24] There are many resources defining and describing the types of separation and infrastructure. The CROW manual is the Dutch go-to guide on cycling infrastructure. The European Cyclists' Federation's (ECF's) 'Safer Cycling Advocate Program' (SCAP) guide gives a good overview of how separation works in the Netherlands and Denmark *https://www.ecf.com/projects/scap*

infrastructure with bicycle and EPACs. E-scooters are a different vehicle with different handling, for the most part they should be able to use bicycle infrastructure without problem, but with much smaller wheels comes different challenges. For example, the lip, kerb or ramp design when transitioning from one roadway to another may be fine for bicycles with larger wheels but may be dangerous for micromobility devices with much smaller wheels. Drainage grills and drains may be more of a hazard for smaller wheels. Are the surfaces used for cycling infrastructure compatible with the wheels of other micromobility devices? Are the radii of curves on a cycle track compatible for monowheel/e-scooter use? Thus, infrastructure must be adapted to the needs of the users of bicycles and micromobility.

In many cities, cycling lanes were already crowded, too narrow, disconnected and in poor condition even before new micromobility devices arrived and aggravated the problem even further. Old cycling lanes are often not suitable anymore for the small wheels of e-scooters. Since planning, applying for subsidies and approval procedures can take a lot of time, faster solutions should be implemented[25] – at least transitionally, provided that their implications are properly assessed in terms of road safety, traffic congestion and user convenience. During the COVID-19 pandemic, several cities transformed traffic or parking lanes into cycling infrastructure using 'light' infrastructure to provide more space for the increasing number of cyclists, for example. However, it is recommended that this light infrastructure is upgraded to more permanent solutions where and when possible. Where light infrastructure is not an option and separate cycle paths cannot be set up, speed management solutions (traffic management, enforcement, lower speed limits) are crucial.

It is important that the footpaths are safe and secure for all pedestrians, therefore it is recommended that e-scooters and other micromobility devices are not permitted on the footpaths. It should be noted that the use of the footpaths by cyclists is often a good indication that the road is not safe for use and that cyclists and micromobility users feel threatened leading to the use of the footpaths. A German study showed that riders of e-scooters are more likely to use footpaths when there are no cycle lanes.[26]

City officials define the concrete area for their services – in the centre and at the outskirts – including no parking zones (for example, in the historic centre, next to tourist attractions and in parks) and places where their availability is particularly welcome (for example, around stations of public transport). These should be properly marked on the road and with signage.

Intermodal mobility stations next to public transport stations and parking spots dedicated to e-scooters, bicycles and EPACs, such as 'e-hubs' which include charging facilities, should also be introduced to organise parking safely without endangering pedestrians, persons with reduced mobility and the visually impaired who might stumble over micromobility devices. Cities could establish virtual hubs with electric scooter and bike-sharing operators. In Paris, virtual hubs are established where there is public bicycle parking infrastructure. Operators are asked to use these for the start and end of a rental. These can be as close as 100 to 150 metres apart. Special traffic signs can signify these parking spots and dedicated parking infrastructure with stands can provide vehicles to be safely and properly stored on public space.

If a city wants to change mobility habits, it must change the distribution of space accordingly. This means dedicating more space to cleaner and active mobility options, for example by reducing parking spots for cars in cities. The space from former parking spots can then be used for a separate lane for micromobility devices and bicycles, but also for parking and mobility stations for these vehicles.

Speeding, drink driving and drug use

The weight and the speed of a micromobility device has an impact on the safety of the rider and other road users. Pedestrians, cyclists and micromobility devices should have their own infrastructure separated from motorised traffic, the separation becoming more physical the higher the speed and density of traffic. Segregated cycle lanes are not possible everywhere, thus traffic calming measures should be a complementary measure. Speed limits play an important role for safety and survival in case of accidents.

Although out of scope of this guide, the European institutions and standardisation bodies should also agree on the classification and safety standards for the micromobility devices themselves. Public authorities (cities or national governments) would then be able to

[25] *https://www.itf-oecd.org/sites/default/files/respacing-cities-resilience-covid-19.pdf*

[26] Unfallforschung der Versicherer, Forschungsbericht Nr. 75, Verkehrssicherheit von E-Scootern (April 2021): *https://udv.de/download/file/fid/13039*

choose which vehicles are allowed on the relevant infrastructure. A top speed of 20 km/h for e-scooters and up to 25 km/h for e-bikes that requires pedal support tend to be the norm. They are not always ridden at this top speed, whereas it is easier to maintain this high speed on an e-scooter by simply depressing the throttle.

Cities could implement a kind of 'good behaviour card (licence)' for bicycle and micromobility users. Nowadays, fewer young people in urban areas hold a driving licence. This means that no rules of the road or security education is provided for many cyclists and new mobility users. It seems important to teach road users to behave properly, such as using lights, taking precautions regarding people with reduced mobility and avoiding risky situations. Cities could also recommend a minimum age for the use of micromobility devices and ban multi-person use.

An important point is one of incentives for micromobility users to speed, such as by-the-minute rental. Operators of shared micromobility fleets should ensure their pricing mechanisms do not encourage riders to take risks. Changing the pricing mechanism from per minute to per km would have an added value to overall safety.

The consumption or being under the effects of alcohol and drugs is not compatible with safe driving. Awareness campaigns should highlight the danger that such behaviours imply. Public authorities should treat the use of micromobility devices under the influence of drugs and alcohol in the same way that other motor vehicles are.

Safety data

Data sharing from shared micromobility opens a precedent and provides local authorities with the possibility to also demand data sharing from other transport operators. This represents a great opportunity to change the approach cities have to data.

Data on accidents helps to make city streets safer for the users of micromobility and the other users of the public space. Police statistics on accidents also include information on the location of accidents and become part of accident maps of a city – but only if the police are involved.

It is important that data collected on use, safety or location is not lumped together into one broad 'micromobility' box. Cycling and e-scooters are different vehicles with different use and different safety needs. A split in the data between private e-scooter use and shared e-scooter use is also recommended. In certain countries, such as Germany, e-scooters have become a new dedicated category in transport accidents statistics.[27]

Specific indicators should be included for road safety of micromobility in the planning process. Data specifications should include the format and the content of the data (that is, as a binding condition for operation or be negotiated with the operator). Allowing each city to set its own data standard runs the risk that data is misinterpreted or misused. Due to the high amount of data to be dealt with, automated data processing is recommended. Solutions already exist regarding specifications on the format (Mobility Data Specifications (MDS) and the Dutch City Data Standard for Mobility (CDS-M) under development. As for content specifications, these will depend on the data collected by the operator and will be subject to privacy legislation.

Collecting data on micromobility trips and crashes could help improve the safety performance of these new services. Any reference to injuries should also ideally split out injuries when using a private e-scooter vs a shared e-scooter. Police and hospitals should collect accurate crash data. It is to be noted that the police only collect data about incidents that they attend – many micromobility incidents are not reported, so it is difficult for the police to collect a comprehensive dataset. The operators themselves may best placed to collect incident data, perhaps using on-board data recorders. Trip data from operators can help improve the safe use of shared e-scooters, as are surveys and on-street observation. It is important to remember that the impact goes much wider than actual incidents – reported or otherwise. Many older and disabled people will lose confidence to go out for fear of an accident. It is well documented that a loss of independent mobility has a significant impact on physical and mental health and wellbeing.

Regarding the road network, cities and operators should cooperate on monitoring and maintenance, using the data provided by the sensors and Global Positioning System (GPS) located on micromobility vehicles (such as data on falls and crashes).

[27] Statistisches Bundesamt, Press release: *https://www.destatis.de/DE/Presse/Pressemitteilungen/2021/03/PD21_N021_462.html;* special evaluation*: https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Verkehrsunfaelle/Tabellen/sonderauswertung-unfaelle-e-scooter.xlsx?__blob=publicationFile*

The General Data Protection Regulation (GDPR), consumer rights and services safety are other key aspects to take into consideration when planning for the collection of micromobility data. Personal data should not, by default, be collected by authorities and only when it is necessary to carry out a specified lawful task for which the public authority has a mandate. The operator should ensure that users agree with anonymised data being shared. The city should ensure also that this sharing clause is included in the contractual agreement with the operator.

Communicating and educating

With regards to e-scooter rental services, cooperating with sharing providers is key. Usually, shared micromobility devices can be activated via mobility apps. These apps should include information on local rules and safety instructions, which should be shown before users can activate the vehicle [28]. Moreover, users of shared e-scooter must register after downloading the apps. This constitutes another chance to increase the users' awareness of the specific local rules and risks of the micromobility device they are about to use for instance through the use of quizzes and periodic reminders. Wearing a helmet should at least be part of recommendations to micromobility users and be included in any visuals to set a good example for users.

Mobility apps also include shared micromobility options and give users the choice of which mobility type they want to use. The inclusion of micromobility in these apps will become the norm with wider applied Mobility as a Service (MaaS). For instance, the Brussels MaaS app and the STIB/MIVB app are providing such options. Other cities in Europe would likely follow, where users can choose between the smartest way, the fastest way, the cheapest way, the most sportive way and the way with least changes. There is also a price indicator for the whole ride and the cost for every used transport in the route planner.

Through contractual arrangements, some cities have pressed e-scooter providers to provide safety equipment. That includes increasing helmet availability and usage. They also encourage them to modify vehicle designs with, for example, more robust chassis and larger wheels better able to manage uneven surfaces. Good practices such as wearing a fluorescent safety vest as well as clothing that protects arms, knees and elbows should also be encouraged. Vehicles could also be equipped with indicators to avoid taking one hand from the handlebar before making a turn.

More effort, time and political will need to be focused on behaviour of the drivers, including educating road users in general on how to keep micromobility riders safe. One of the key safety recommendations from the International Transport Forum[29] is to include micromobility in training for road users: training for car, bus and truck drivers to avoid crashes with micromobility riders should be mandatory. Micromobility users should also be trained in how to behave next to long and large vehicles, the principles of blind spots, and so on. Training for cycling and micromobility devices should be part of the school curriculum. Cities could design their own training programmes, which could include their local specificities and rules. These training programmes should then be used by their local micromobility operators (requirement in tender specifications) and be regularly updated.

[28] Such information on the local rules could include the minimum age required, road usage guidelines regarding cycle paths and pedestrian crossings, and limiting one person per device.

[29] *https://www.itf-oecd.org/sites/default/files/docs/safe-micromobility_1.pdf*

Examples of campaign on e-scooters in Germany

In 2020, the German Road Safety Council (DVR) launched a nationwide campaign on the safe use of e-scooters. The campaign is financed by the Federal Ministry of Transport and the statutory accident insurance. According to a German regulation which entered into force in the middle of June 2019, e-scooters are defined as vehicles usually without a seat but with a handlebar, lights, brakes, a bell and a maximum speed of 20 kph. Other vehicles which might be categorised as micro mobility devices such as hoverboards or electric skateboards must not be used in public traffic. To determine the main knowledge gaps concerning the use of e-scooters among the users of these vehicles, DVR conducted a representative survey. The results showed that 51% did not know that the blood-alcohol limit for the use of e-scooters is the same as that for the use of other motor vehicles. Moreover, more than one in four were unaware of the fact that e-scooters must not be used on footpaths.

Information on these and other rules which are often not respected were visualised and then printed on stickers and tags which were attached to e-scooters by providers of e-scooter sharing. The messages on the tags are printed in German and English to make them accessible to international users as well. In addition to this, visuals and video clips were posted on social media.

Further topics covered by the campaign include two people riding one e-scooter and chaotic parking. Cooperating with providers of shared e-scooters has proven very helpful since the information can hardly be overlooked when it is attached to the vehicle itself. A humorous approach was chosen to convey the messages.

When educating about the use of e-scooter micromobility services, it would be useful to have a clear set of rules in mind. Users should be educated and prove their knowledge regarding the highway code. In particular, younger users who do not have a driver's licence should learn traffic rules before they use e-scooter micromobility devices. To create a culture where all modes are accepted and safety is paramount, awareness of the existing voluntary safe driving training courses for micromobility devices should be raised, especially for young and elderly people.

Several studies show that the first rides on standing e-scooters are the most dangerous ones – one third of e-scooter accidents with injuries happen during the first ride on these vehicles. It might be sensible to require riders to make their first rides in areas with minimal traffic and open spaces where they can master the control of the machine before attempting to ride in mixed traffic. It would also be worthwhile considering limiting e-scooter speed on first rides and increase it as the user gains experience. There are obviously some significant barriers to mandating such a scheme, although rental companies may be in a position to require something of this nature, even though this would still cause issues for experienced riders who wanted to swap from one rental operator to another.

Training users in a safe space before they participate in normal street traffic, ideally with the help of professional trainers, might also help new users to familiarise themselves with the vehicles. However, sharing apps can also come in handy and make suggestions concerning the question how to make your first 'steps' safely before you hit a busy street. On the other hand, operators may be forced to push their users to complete the training before jumping on the scooter.

Some cities require the operators of shared e-scooter micromobility services to develop campaigns that can be aimed at users (safe and civil behaviours such as where and how to ride, observing speed limits, helmet use and proper parking) and at prospective users (especially to make sure lower-income citizens feel welcomed and supported in using micromobility services). Campaigns can include advertising (on many platforms, including social media), printed materials (that can be tagged to the vehicle and distributed, such as at events and public information desks), dedicated or other public events, community sessions and meetings with local stakeholders.

Another issue to bear in mind is linked to the fact that the rules on the use of these vehicles vary from country to country, sometimes between regions or even cities within one country. So these differences must be communicated to many recipients including tourists who take their own micro mobility vehicle on a city trip.

3.3 Climate neutrality and zero pollution ambition

New mobility concepts such as micromobility may have the potential to reduce congestion and improve air quality in cities, for instance by replacing certain car trips. Better planning for micromobility can help achieve climate neutrality by 2050 and the EU's zero pollution ambition.

Environment and congestion: modal shift

Local authorities first need a clear vision and modal shift goals, and micromobility can help to serve these goals. E-scooters in the context of a SUMP can contribute to the development of a variety of transport modes. Micromobility can be used to accelerate the use of a multimodal transport system and active mobility. It can also be a tool at the service of cities to reduce traffic congestion and promote multimodality.

Strategic planning can then envisage how to ensure operators of micromobility services serve city goals, and can be added to active travel and public transport, as part of the backbone of the transport system.

Micromobility – Modal shift in Brussels, Mobility Survey Summer 2019

- 1,259 scooter users responded to the survey.
- Scooter use is occasional.
- 20% use scooters several times a week, most use scooters one to three times per month or less.
- Average journey time between 5 and 10 minutes.
- 64% of users are men with 50% using scooters between 25 and 34 minutes.
- Over 50% of users in higher education.
- 25% of users substituted car or motorbike trips.
- 75% replaced public transport or walking.

It is important to consider the added value of micromobility and how it fits into the long-term sustainable goals that cities set. Environmental concerns around climate change have provided another powerful driving force for change, with European cities declaring climate emergencies and taking action on climate targets[30]. Micromobility can contribute positively to the solution of some of the problems faced by cities, such as air quality and congestion.

Urban planners should however try to avoid that electric scooter rental service trips substitute walking and public transport rather than the private motor car, as it has been the case in Brussels (see example above). Policies should be put in place to support the increased use of bicycles, EPACs and e-scooters along with providing good facilities for public transport in urban areas to support walking and public transport within a multimodal mix. Micromobility services should be complementary to public transport services: micromobility devices could be proposed as a solution to join the main public transport network from urban areas with fewer or no public transport connections. It is important to communicate about such transport options and possibilities of combining micromobility with public transport. Rental schemes could also be promoted as an easier combination of public services and micromobility.

Batteries

There are key elements linked to micromobility that should not be neglected, including the recharging and recycling of batteries. Micromobility products deployed initially did not include information on the lifespan of their vehicles. For example, cities have reported that for shared e-scooters, this is only 3-6 months.

The batteries and their recharging is a key issue, as shared micromobility vehicles have to be collected for their batteries to be recharged. These vehicles are spread around the city, leading to additional journeys for the collection of these vehicles for the purposes of recharging but also the redistribution around cities, so as to ensure that there is appropriate coverage of the vehicles at key locations. It is also important to note the difference in 'non-revenue vehicle km' travelled by servicing vehicles, depending on e-scooter fleet with / without swappable batteries. Newer batteries allow longer distance, hence the number of charging moments drops and so does the number of trip. However, logistics around free-floating fleets is still the most urgent environmental problem.

Cities should require clarity from operators on these aspects when procuring micromobility services, taking into consideration the whole 'life cycle' emissions associated with the batteries, carbon footprint, certifications, as well as wider circular economy principles. Awareness-raising campaigns should also target owners of privately owned micromobility devices.

[30] *https://eurocities.eu/latest/european-cities-want-more-ambitious-climate-targets/*

3.4 Reducing inequalities

While shared e-scooters and e-bikes have potential to serve areas with limited access to public transport, the experience of many cities has shown that this has not always been realised.

E-scooters can also pose a risk to people with disabilities due to their faster speeds and lack of noise. Parked e-scooters, especially when part of a dockless sharing system, can pose trip hazards and obstacles. Seniors, people with disabilities and those with socio-economic challenges could face a negative outcome if injured in a collision or fall. Therefore, solutions for parking micromobility devices in designated spots apart from footpaths are crucial.

Accessibility

Generally, the low-cost characteristics of micromobility vehicles mean that they can also support improved accessibility and enhanced social mobility.

Cities have the right to expect and to ensure that operators of shared micromobility services are trustworthy and reliable, and do not discriminate negatively against any group. Consideration must be given to the way in which micromobility can be used to serve the needs of those who have different needs from the conventional core demographic for micromobility devices (for example, parents with young children and those with physical mobility challenges).

Cities can, for instance, require or incentivise operators to include adapted vehicles in their fleets, such as machines that are specifically designed for the use of those with physical disabilities (for example, tricycles and hand-pedalled or recumbent bicycles). Special procedures for reserving and accessing these vehicles can also be put in place (for example, specific user limitations require specific adaptations). These procedures should focus on matching users with vehicles that respond to their needs, facilitating access by being easy and fast – not adding an extra burden on users.

It is also important to reach out to organisations representing people with all types of disabilities. This will help to understand their barriers and the exact risks that they face with the arrival of new mobility devices, and to plan for a more inclusive and accessible transport offer, including micromobility in their Persons with Reduced Mobility strategy for instance.

4. Governance and regulation

Micromobility has created learning opportunities for cities in designing and establishing regulations. In that context, the Safe System approach seeks to recognise the responsibility shared by all contributors to the elements of the system. There is a responsibility to collectively manage all inputs so that the likelihood of successful integration of micromobility into wider city goals is achieved. As planners and managers of public space, cities can influence micromobility developments and try to set them on a course that serves the public interest. Cities could also use micromobility as a test case for deploying a new governance model that can bring together the private and public sectors, and all modes of travel.

Cities need to operate within a clear legal basis, depending on the national and regional competences. Strong local regulations are also paramount for micromobility services to flourish in cities. Cities should choose the instrument they want to apply in selecting operators. While tenders are often preferred by medium-sized or large cities, some cities might prefer other solutions, such as the introduction of parking fees, memoranda of understanding, licences, authorisations and letters of intent. The instrument chosen will depend on the mobility objectives and the market situation in the city.

To set a course, cities need to know where they want to get to and how these innovations can help them to get there. Here is a key role for political vision. Micromobility indeed offers a real opportunity to reinvent mobility planning and governance structures.

Commercial operators have also expressed their support for collaborative development of governance and regulations. This creates market conditions that are more likely to include best practice and reduce the amount of 'reinventing the wheel' on a city-by-city basis.

4.1 Cooperation

Cooperation that brings all stakeholders into the conversation (such as in a consultative committee) appears to be the best way ahead and should be the foundation of planning for micromobility, especially in the context of Vision Zero. As regards shared micromobility services, the lines of responsibility between micromobility providers, users and governments are nascent, and it is only through collective dialogue that the right balance can be struck. Cooperation in building more micromobility-friendly infrastructure is another key avenue to consider. While costs per km can vary wildly, academic research suggests constructing cycle lanes is extremely cost-effective once the knock-on benefits of lower injury risk and more use of active modes of transportation are taken into account.

Roles of stakeholders			
	Users	**Service providers**	**Authorities**
Safe driving	Driving in compliance with laws.	Instructions and education, restrictions by geofencing (speed limits, service areas), safe operating times (for example no service at nights or in winters).	Safe infrastructure, better speed management solutions (traffic management, enforcement, lower speed limits).
Safe parking	Parking in compliance with laws and on marked parking areas if possible.	Parking ban zones by geofencing or by terms and conditions, discount when parking on certain areas.	Marking parking areas.
Monitoring and collecting data	Users can notify the police and service providers if an accident has happened.	Collecting data about trips, distance and accidents.	Collecting and analysing the data.
Infrastructure	-	Parking racks (at least on private areas).	Cycle paths / lanes suitable for micromobility, parking racks / areas on the streets.
Enforcement	-	Enough staff for moving the vehicles that are badly parked.	Police enforcement for driving on the footpaths or intoxicated, parking enforcement by cities/ police.
Education	Learning rules and laws.	Instructions and education on applications and websites, campaigns.	Education and information in the schools, driving schools and in other sources.

4.2 Varying types and degrees of regulation

Since the explosion of shared bicycles and e-scooters on city streets, many cities have approached shared micromobility offerings with concern. Some cities designed and implemented strict regulations to counter negative externalities, like misuse of public space and unsafe riding.

Differences in regulations across countries are definitely a challenge. But cities also learned from each other and best practice for shared micromobility governance emerged. What this experience has showed is that a purely regulatory approach might not achieve the expected outcome from micromobility deployment. A mix of governance approaches including regulation, policy and potentially financing can be used to integrate micromobility into urban mobility planning.

City authorities will still need to decide, based on their overall planning and procurement context, how to enable the deployment of shared micromobility services. A number of models or combinations of models are available:

- hands-off approach
- providing regulatory ground rules
- requiring operational permits/licences
- contracts for concessions
- pilots/demonstrations
- banning / not allowing operations

An approach that is either too strict or too lax could stifle innovation and user choice, and lead to higher user costs and unintended consequences. A strong local regulatory framework is key for all the above mentioned options as this clearly sets out the rules of the game.

Micromobility strategy of Toulouse (France)

- Deployment strategy & charter for free-floating bicycle and scooter shares.
- Protect public interest: quality of service; management of public space.
- Fixing desired volume of vehicles in circulation, fee to be paid to use public space.
- Compliance with rules as prerequisite for deployment.

It is worth noting that cities do not have the powers to set the technical specification for the manufacture and sale of micromobility devices. Appropriate regulations are currently under consideration[31].

Recommendations from the TRL investigation on behalf of the European Commission into Personal Mobility Devices

- Align road circulation regulations for new types of personal mobility device with existing national pedal cycle regulations.
- Ensure that EPACs remain outside the scope of Regulation (EU) No 168/2013.
- Create a dedicated approval process for personal mobility devices separate from Regulation (EU) No 168/2013 and the Machinery Directive.
- Regulate maximum speed at an appropriate level for safety and infrastructure (25 or 30 kph).
- If it is necessary to regulate maximum motor power do so at a level that does not discourage the development of new vehicle configurations (1 000 W).
- Ensure that regulations do not stifle the development of the cargo bike industry.
- Change to the L1e-A sub-category to increase the maximum assistance speed limit to 45 kph while retaining the 1 000 W motor power limit without a cap on maximum assistance factor.
- Harmonise the arrangements for recording and reporting collisions involving personal mobility devices.

National governments set the regulations for road use via their road codes and licensing regulations. Local governments deploy those rules through application of speed limits, access controls, parking policies and infrastructure, so there is considerable scope for cities to achieve policy aims through local arrangements.

Governance structures for micromobility deployment should include these elements to get coherent policy making. For example, existing fora for addressing cycling, walking or disabled persons needs should be included in all micromobility deployment governance arrangements so that the externalities of micromobility deployment are scrutinised.

[31] *https://trl.co.uk/uploads/trl/documents/ET0221146ENN.en.pdf*

Micromobility strategy of Bologna (Italy)

- Tender through competitive dialogue.
- Incentives structure.
- Service obligations.
- Mutual data sharing.
- Revenues known and shared beyond certain threshold.
- One operator selected of three bidders.

4.3 Getting what you need from the market

While many challenges are the same, regulatory approaches in cities can differ considerably. Over the past few years, many cities have gained experience in market access models and have learned to design and establish regulations. In doing so, many city authorities have launched and maintained a constructive dialogue with scooter providers, which is a good precondition for the future evolution of local regulation.

Cities need to be in the driver's seat and know what they want to achieve. They need to re-visit the regulatory model chosen and evaluate it has contributed to expected outcome and has adequately allowed for new innovations in vehicles or service delivery.

Cities should consider the most appropriate regulatory model (for example, single or multiple tendered franchise) and have control over their market. If cities decide to select providers of shared micromobility using tender procedures, they can set their own priorities that help them reach their goals with clear responsibilities concerning (for example, traffic safety, sustainability and intermodality). Moreover, this can fuel competition among the providers, which in turn constitutes a driver for change and technological progress.

Some, not necessarily good, ways of regulating access to the market are for instance the rights of local authorities to:

- Terminate permits at any time, for due cause, including causes not specified in the regulatory agreement and require the operator to remove their entire fleet of vehicles from city streets. Contracts written in this way would however tend to favour operators with a short-term mindset. Operators would be much less willing to make investments with long payback periods if they ran the risk that their contract could be terminated at any moment for reasons that may not even be specified in their contract.
- Limit the number of companies operating (for example, cap the number of permits or licences issued and/or issue exclusive contracts, permits or licences).
- Limit the number of vehicles that any individual company can deploy, on a per-permit basis.
- Prohibit specific companies from operating in the public right-of-way based on conduct or prior conduct (for example, if a company deploys equipment prior to applying for a permit, licence or contract, or fails to comply with permit, contract or licence terms).
- Limit the duration of licences and permits to a fixed time period. To allow the operators to properly establish infrastructure and adapt to local conditions, licences are recommended to be valid for a minimum period of 12 months. All companies should be asked to re-apply for each renewal. This might also have the effect of favouring companies with a short-term business model, rather than those prepared to make long-term investments. If a city wants companies to make long-term investments by, for example, building docking areas or providing rider training, then it needs to give them the opportunity to recoup that investment over an extended period. Contracts developed as the result of competitive bidding processes may have a longer duration. Companies should be aware that cities may update permit terms over time.
- Require operators to provide written notice, at least 14 days before ceasing operations, if they are no longer willing or able to provide service in the city.
- Introduce differentiated parking fees, with a higher price being charged in the busy city areas (often in the city centre) and a lower price being charged in the suburban areas. This creates an additional revenue stream for cities (which could for example be used for the creation of safe, segregated cycling infrastructure) and allows cities to manage fleet size (idle scooters will be taken off the street by operators as they become too expensive) and to stimulate a more balanced distribution of the fleet across the city.

Cities can also further stimulate their policy objectives (for example, by allowing for a reduced fee for trips that combine public transport and micromobility). Third-party regulation tools, like Nivel[32], provide cities with an easy and cost-effective solution to manage fees.

Public procurement can play a role in encouraging (or discouraging) the development of shared micromobility services. Innovative procurement could be used to ensure that the chosen solutions favour the user and do not create monopolies or bottlenecks. Public procurement can also be used to set requirements for road safety, interoperability, data sharing or the use of open Application Programming Interfaces (APIs).

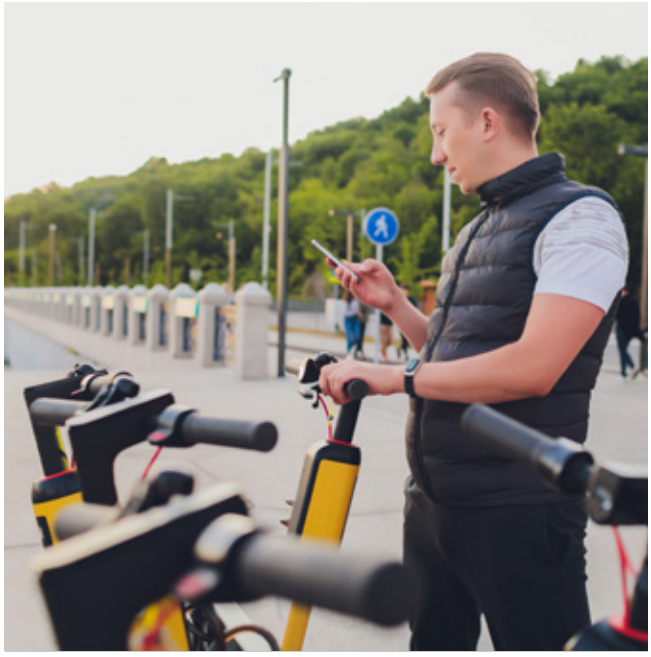
Each offer should be analysed according to the city's strategy: is an e-scooter offer, for instance, in compliance with the city's mobility objectives? Is the city wanting to increase the number of trips with theses offers or mostly to reduce them? Objectives might be to increase active mobility with shared mobility (e-bikes for instance), to give alternative options for trips done by public transport during peak hours (e-bikes, moped, scooters) or to use free-floating offers as a solution for areas not served by public transportation.

Some bike-sharing companies have already provided extensive guidance to cities[33] on how to tender effectively for services in a way that allows companies to transfer expertise from other implementations and build in innovation and incentives in such a way that there is a 'win-win' for both parties.

Cities should also analyse how attractive they are for private operators of shared micromobility. While some cities would need to restrict the number of vehicles and operators, some other cities in suburban areas would find it difficult to actually attract private operators, as a high number of trips per engine would not be guaranteed. Defining fees for public space use and defining restrictions for riding and parking might be alternatives to limit shared micromobility.

The contractual framework needs to allow for a service to evolve, but in fact proven operational technologies can be more cost effective, more reliable and achieve SUMP goals. The process should be outcome-led, not innovation-led. Some criteria when selecting operators by a competitive procedure need to define clear performance indicators that could easily be measured. Operators should cooperate with the city by setting and monitoring objective indicators. Whenever possible, certified reports provided by third parties should be requested. For example:

- percentage of covered area of the city with the offer (or indicators like 'the operators guarantees a device will be available for rent in less than 5/10 minutes for 100% of the total city population');
- percentage of the deployed fleet ready to be used during operational hours in relation to the total authorised number;
- environmental criteria: carbon footprint of the whole activity, life cycle assessment (LCA); percent of green and renewable energy used;
- measured objectives regarding provided technology and educating users.



[32] *https://www.nivel.no/*

[33] Donkey Republic recommendations to cities*: https://drive.google.com/file/d/1tX-U7b5yPn3YDb51XcuV2YwBK6goCnCh/view?usp=sharing*

The Paris (France) experience: A Charter of Good Conduct while waiting for a new national legal framework

In 2018, the Parisian context was favourable for free-floating scooters: the presence of a consolidated, reliable and dense public transport offer; the increase in cycling infrastructure; the absence of a national legal framework before the end of 2019; a political will to welcome and to support new forms of shared soft mobility; and a population ready to opt for shared modes and able to pay the fare (between EUR 3 and EUR 4).

More than 15 000 electric scooters flourished in early 2019 and offered a travel alternative for short trips. The time lapse between the appearance of these new services and the evolution of the regulatory framework has led Paris to address the issue by focusing first of all on dialogue with operators.

The city decided to act and put in place specific measures to supervise these new practices – mainly to ease relations between the different users and to protect the most vulnerable people in the absence of a legal framework. There was indeed a major legal vacuum regarding the treatment of electric scooters for nearly 18 months, since they were not subject to the highway code and the national Law on Mobility (LOM) was still to be discussed for several months until its approval by the French government.

A working group was set up in June 2018 between Paris and the first operator of free-floating electric scooters to arrive in the capital. Gradually, the new e-scooter providers arriving in the city were integrated into this group to develop a Charter of Good Conduct relating to the rental of these devices in the public space and concerning data sharing. All operators deployed in Paris signed this Charter in May 2019. In 2019, these trips represented between 0.8% and 1.9% of internal trips in Paris.

In early 2019 and following the delay in the adoption of a new Law on Mobility (LOM), the city implemented the following actions:

- In April 2019, the Paris Council deliberated on establishing a fee for all free-floating operators including scooters (from EUR 50 to EUR 65 per scooter depending on the size of the fleet deployed).
- In June, the Mayor of Paris asked the operators of electric scooters to:
  - limit their speed to 20 kph and 8 kph in pedestrian areas and meeting areas;
  - freeze the number of electric scooters available in Paris and, if possible, reduce this number until the government clarifies the legal framework.
- A municipal law relating to the parking of scooters was also published on 30 July 2019 to prohibit parking on footpaths and pedestrian areas, under penalty of fines for users by municipal police officers. Scooters were authorised to park in paid parking spaces used by cars and spaces dedicated to motorised two-wheelers on the road. The city enforced the decree by removing and towing away badly parked scooters that would otherwise hamper the circulation of pedestrians in particular.

4.4 Regulate operations

Shared micromobility operators deploy fleet, digital applications and payment methods that impact public space, users and non-users, and should, therefore, be regulated. In Europe, it is generally the national legal framework that determines who can set these rules. Many countries have defined such rules and cities can only regulate the activities of operators within the city area[34]. Strong local regulation, developed in consultation with stakeholders, is also key to responsibly regulate micromobility.

More generally speaking, and as detailed in a study from TRL on behalf of the European Commission[35], the rules for the use of micromobility could be similar to those that are already in force for bicycles. This could mean that micromobility vehicles should be used on cycle paths or streets, but not on footpaths. Violations should be prosecuted. Their speed should be similar to the speed of cyclists and so should their equipment: handlebar for stability and control, brakes, bell, lights, reflecting elements. This approach seeks to reduce the confusion that can arise when dealing with apparently similar vehicles which belong to different categories and are thus subject to different regulations.

This approach is favoured over the development of a bespoke set of user regulations specifically to deal with micromobility devices because it reduces the educational challenge for users and law enforcement officers who would otherwise be required to learn a whole new set of rules and their criteria for application.

Introducing new rules inevitably requires a substantial and expensive public information campaign or runs the risk of criminalising micromobility device users who unwittingly break laws of which they were not aware. This has happened in the UK where private e-scooters remain legal to buy, but illegal to use in public places.

The biggest challenge to this approach lies in ensuring that any new risks arising from the operation of micromobility devices, that were not previously considered when regulations for pedal cycles were devised, are adequately managed; for example, if a device requires a significantly different skillset to operate safely. This approach is also predicated on the principle that micromobility devices share their important safety characteristics – primarily speed and mass, with pedal cycles and thus care must be taken to ensure that micromobility devices that are regulated in this way do not deviate significantly from these norms.

The other significant challenge to this approach arises from the possibility that users of micromobility devices may not have any experience or knowledge of road regulations and, given the nature of the micromobility market, may have their very first experiences of riding an unfamiliar vehicle on a busy urban street. While the possibility of this scenario is equally valid for a pedal cycle user, given the long history of pedal cycles, it is much more likely that they would have built up experience of riding bicycles from an early age and, while they may not have had any formal training, would at least have had the opportunity to develop their vehicle control skills and 'road sense' over a prolonged period under progressively more challenging traffic conditions. It is thus the sudden appearance of new micromobility devices in large numbers, in urban areas, that carries an additional safety challenge, which needs to be considered when user regulations are devised. Consideration must be given to the effect of regulations that prevent micromobility users from practising in safer spaces like parks or pedestrianised streets.

Care must also be taken to ensure that external societal factors do not disproportionately increase the risk of micromobility device use; for example, it is important to ensure that people who are impaired due to alcohol or drugs are discouraged from using micromobility devices.

Madrid (Spain) e-scooter rules

- Prohibited on footpaths, bus lanes, streets with more than 1 lane in each direction, main ring roads.
- Allowed on cycle lanes, streets with 30 kph speed limit.
- Parking: areas reserved to motorcycles and bicycles, if not available then general parking area of the road and, in the last case, on the sidewalks.
- Minimum age: 15 (under 16 helmet mandatory).
- Minimum equipment: bell, brakes, lights and reflective elements.

[34] As mentioned in section 5.1 below, it is preferable to take an approach to a whole functional urban area that goes beyond municipal boundaries.

[35] Study on market development and related road safety risks for L-category vehicles and new personal mobility devices

Recommendations for regulating operations include:

- **The number of operators**

Before limiting the number of operators, a proper assessment of the local situation is key. The services should be based on the size of the city and users' needs. Without specific local issues and/or if other measures to ensure safe operations are put in place there might be no clear need to limit the number of operators,. A limit on operators could risk resulting in negative effects due to lack of competition (such as limited innovation, higher prices and less consumer choice). The monitoring and management of these operations, as well as the enforcement process, can also be challenging for cities.

- **The size of the fleet**

The total number of each type of vehicle allowed on the streets could be capped. Limits could be set for service provision and for specific areas of the city. These limits could set a minimum and/or a maximum number of vehicles, based on certain factors linked to the city (such as its available space and demographics) and ensuring that vulnerable population groups are also taken into account. It should be taken into account that a limit on fleet size does not reflect the potentially changing and evolving need for additional supply. Alternative actions such as dynamic caps, seasonal allotments and location-based caps would also be an option but require data. Hence, operators should be required to share this data with cities.

- **Rebalancing and fleet redistribution**

City authorities should also determine pre-set requirements for fleet deployment that operators should follow. Operators should carefully monitor their operations to comply with maximum or minimum fleet sizes in different sectors of the city. This will also avoid cluttering of public space with micromobility vehicles. Cities can also opt to introduce parking fees to regulate distribution across the city.

- **Geofencing for service limitations**

Geofencing is a useful dynamic approach to enforce speed limits per area in a city. Limits should be set by the city regarding parking, speed limits and areas where access is prohibited, such as pedestrian zones. These limits are included in the form of road signage and into digital maps (geofencing) with which the apps communicate. The apps can help enforce these limits: to prevent parking, they can disable locking and unlocking or act on the electric engine. However, this can be dangerous if it happens during the ride (for example, on an intersection). This is why it is not allowed in Germany for instance. Throttling must start at the beginning of the ride but must not be activated later during the ride. Geofencing conditions and remote scooter commands are well designed and tested – they should be used more by cities and should not be automatically restricted. This depends also on national legislation: in Germany, e-scooters must not be slowed down during a ride since this could bring users in dangerous situations. It is to be noted that micromobility, and e-scooters specifically, are the only road vehicle that have hard controls on speed.

- **Parking**

Whether for privately owned of shared micromobility, regulating parking is an essential part of the micromobility equation in cities. Parking rules should be clearly defined and communicated. For shared micromobility devices, preference should be given to parking in 'mobility corrals', 'virtual hubs' or 'bicycle hot spots'. Bike-sharing experience shows that deployment of virtual hubs is similar to conventional cycle parking, that availability needs to be frequent and very convenient (for example, 100 metres apart) to encourage compliance and use.

For a successful micromobility parking strategy, the city, alone or together with the operator(s), must provide enough parking facilities at regular intervals. Parking rules are challenging to monitor and enforce though, especially in big cities where users' numbers are high. Parking guidelines, communication and education can help. These should address accessibility issues, like tactile markings for visually impaired people and the blockage of routes for persons with reduced mobility.

Operators of shared micromobility services should be required to remove vehicles that are improperly parked or damaged, or were left in areas difficult to access. The city, together with the operator(s), but also citizens in general, can propose easy-to-use alert procedures. A requirement for operators should be to deal with removal requests within a set timeframe, to be monitored and enforced by the city.

Example of geofencing pilot in Helsinki (Finland)

In 2021 in Helsinki, there are three operators offering rentable e-scooters for use of customers. The scooters work with smartphone apps and their parking is allowed on pavements in the same way as bicycles, according to Finnish law. Also, when it comes to driving scooters, the same laws are followed as on bicycles. On scooters, you have to drive along a cycle path or a bicycle lane. If neither is on the street, you have to drive on the roadway. Geofencing areas are in use by all three operators. Firstly, the service area of scooters is not the whole of Helsinki. The area is mainly limited to the inner city and the areas nearby the city centre. The journey cannot be ended and the scooter cannot be parked outside the service area which is specified by geofencing. Some of the areas outside the service area are such that it is not possible to drive there at all on a scooter. For example the island of Seurasaari is that kind of area. It is forbidden to ride a bicycle on the island as well, so the same rule has been applied to the scooters.

The main geofencing functions visible to the customers are parking ban zones and speed limit zones. The vast majority of city parks and the platforms of the railway stations have parking ban zones, as do lots of areas adjacent to the sea (lest scooters end up in the sea). Lower speed limits set by geofencing areas are in use in the most important pedestrian streets and areas, for example on the pedestrian street Keskuskatu, on the railway station area and on the market squares of Kasarmitori and Kamppi. Also in the areas where are lots of construction works or road works lower speed limits can be used temporarily.

The newest geofencing pilot was set in July 2021. There have been problems in Helsinki, particularly on weekends at night, when there have been many injuries to scooter drivers. Drivers have often driven under the influence of alcohol. To solve the problem the e-scooter operators set geofencing areas in the city centre and areas nearby with lower speed limit (15 km/h) at weekend nights between midnight and 6 am. The speed limit is lowered only at night time in weekends and the area covers over 700 hectares.

In August 2021, the city of Helsinki and the companies renting out e-scooters have agreed on changes to the rental policies, with the goal to traffic safety: all companies renting out e-scooters in Helsinki will start restricting the maximum speed of their e-scooters. The maximum speed will be lowered from 25 km/h to 20 km/h in the daytime and to 15 km/h at night (from midnight to 5 am). These changes have entered into force on 3 September 2021 and remain in force until further notice.

In addition to this, a trial has started during which rental e-scooters will be completely unavailable during weekend nights (nights of Fri–Sat and Sat–Sun) from midnight to 5 am. The trial will continue until the end of 2021, at which point its potential continuation will be agreed on. At the same time, data will be gathered on how the time restrictions affect the number of accidents, with season-specific changes in the utilisation rates also taken into account.

The new restrictions on the maximum speed and operating times of rental e-scooters will apply everywhere in Helsinki. Prior to this change coming into force, speed restrictions have been tested in the city centre during weekend nights.

- **Dockless-to-docked (and vice versa)**

Cities should require docking in specific areas, especially in denser areas or in places where higher pedestrian flows may be badly impacted by dockless vehicles, such as public transport hubs. The city should favour solutions for fixed docking that include electric charging of docked vehicles to help operations.

- **Insurance**

In procurement rules, the city should check that shared micromobility operators hold an insurance that covers damages by their users and vehicles to the city's public space, but also damages to other users of the street. Information on compensation for damages and who to contact should be made clearly available. For example, in France, an operator renting e-scooters has the same obligations as an operator renting cars or mopeds as far as providing insurance and information for clients is concerned. In addition, in France, e-scooters belong to the Personal Mobility Devices categories according to the highway code. According to insurance policies in France, when a person rides or buys a personal mobility device, it is considered as any other motorised vehicle (car, moped or moto), so the person has to make sure he/she has insurance to cover damage to third parties[36].

- **Vehicle specifications and maintenance**

In its contract with micromobility provider(s), the city should define maintenance and inspection schedules of shared micromobility services as well as requirements on vehicle characteristics that are relevant for their safety and functionality. This concerns also the recycling and disposal of batteries, which is an important point to take into account.

- **Fees and subsidised fares**

For shared micromobility services, the city can decide to set a more dynamic fee system, with higher fees in the city centre or lower fees if the journey ends by a transport hub. If users are well informed and understand its implications, a more precise fee system might influence users' behaviour and services' deployment. It is a tool to serve a city's goals, like modal shift.

As part of its financial planning, the city can also decide to subsidise certain types of trips that directly serve strategic urban mobility interests (for example, trips to and from public transport hubs and schools). This can be a mobility management strategy to boost a modal shift.

- **End of operations**

As part of the procurement for shared micromobility services, the city should include clear rules on actions to be fulfilled by the operator at the end of its contract. This includes for instance a safety deposit and rules on the removal of all the vehicles and their batteries.

- **Micromobility for urban logistics**

Micromobility devices, bicycles and cargo bikes used for commercial urban logistics (including food delivery) are excluded from the scope of this document since this is a wide-ranging topic with extensive alternative sources including SUMP Guidance on logistics and access controls and will in the future be included in Strategic Urban Logistics Plans[37] (SULPs).

However, e-scooters are now being used in place of mopeds and bicycles by freelance delivery services – especially in the fast-food sector. While clearly not designed for this use case, delivery riders are becoming a significant rider group in some cities.

Micromobility for goods, businesses and largely understood cargo (either large quantities or individual deliveries) could have allocated space created for their operations. At this moment, very few cities actually provide loading/unloading bays or zones, not only for bicycles but in general. This is essential to ensure that bicycle lanes are not being used as parking or drop off zones for deliveries.

[36] *https://fpmm.fr/veille-technique/reglementations/*

[37] Guidance on light vehicles in SUMPs should be produced as an output of the Horizon Europe CIVITAS projects which will be included in HORIZON-CL5-2021-D6-01-08: New delivery methods and business/operating models to green the last mile and optimise road transport.

4.5 Monitoring

Monitoring is a key aspect of Vision Zero. City authorities should establish systems to monitor mobility behaviour across all transport modes – as a baseline and for measuring ongoing change. Attaching additional values such as health benefits and emissions to each mode allows the total appraisal and impact to be calculated.

Key indicators should be agreed with the operators and monitoring systems should be put in place. This could be via a third-party software service. These types of management systems are already in use for things like managing public transport and urban parking. This is for shared micromobility to become an effective part of the overall mobility system. Such mechanisms will support impact assessment of mobility policies and effective regulation development and enforcement. This will also enable effective street-level management of these new mobility services and help to improve the public image of the services, their operators and the city authorities.

With the goal to put its Strategic Action Plan on Road Safety into practice, the European Commission published a list of key safety performance indicators, elaborated in close cooperation with Member States, that will be monitored across the EU to underpin the target of 50% reduction in fatalities and serious injuries by 2030. The list (including indicators like vehicle safety, sober driving, infrastructure, speed compliance and post-crash care) is a living document that will be updated regularly[38] and could be applied to monitor micromobility in the context of Vision Zero.

4.6 Enforcement

Cities should also have regulations to reduce negative effects of micromobility. For shared micromobility services, these regulations should allow a city to suspend or terminate permits or licences previously issued to the operator. It is important to establish clear criteria and procedures to enable this sort of regulations and avoid legal disputes. Continued failure by operators to comply with one or more legal or contractual requirements should lead to formal warnings and, eventually, sanctions. Some cities work with penalty points when operators fail to follow them. When they reach a certain number of points, operators lose their permit.

A soft approach could consist in establishing an open consultative committee with regular meetings involving citizens and key stakeholders in shared micromobility, including all operators and relevant city services (such as traffic and public space departments), public mobility authorities and or companies, but also police forces, which have enforcing power for traffic code violations. Operators should be expected to participate, either on a voluntary or a mandatory basis (the latter only works if sanctions are applicable to those not participating). Meetings should focus on operational matters that go beyond a bilateral relation and need to be addressed by a wider and more diverse group. It can also serve to encourage cooperation between different stakeholders (such as in outreach and education campaigns).

Regulations should also apply to individual riders violating the national and local rules on the use of micromobility vehicles.

Example of enforcement of shared micromobility in Antwerp (Belgium)

Over the last 4 years, Antwerp municipality has seen a growing interest from the private sector in deploying shared mobility. A range of shared e-bikes, e-scooters and mopeds are being introduced on Antwerp's streets and squares. In this context, the city introduced a regulation in March 2021 that suggests a penalty system based on points. There are different types of offence that will give a predetermined amount of penalty points to the provider. Every point remains on the provider's record for 1 year. These penalties relate to the following requirements:

- Shared data: providers of shared mobility are obliged to share their data with the municipality to control use, availability and distribution of vehicles. The latter is important to make sure vehicles are available in all parts of the city.
- Drop zones for shared vehicles, to prevent blocking passage.
- Reporting and follow up on wrongly parked vehicles.
- Speed limits for shared vehicles are enforced.
- Providers need to run a Dutch spoken helpdesk.
- No parking zones by use of geofencing technology in crowded areas.
- No go zones (geofencing).

The penalty points system works as follows:

- 30 points: loss of 10% of licensed fleet size for 1 quarter of a year.
- 60 points: loss of 50% of licensed fleet size for 1 quarter of a year.
- 90 points: loss of 100% of licensed fleet size for 1 quarter of a year.
- 120 points: withdrawal of licence.

[38] COM(2018) 293

4.7 Data management

The root of many cities' main challenge with micromobility, and at the same time a possible solution to finding a sustainable and mutually beneficial way ahead, could lie in the sharing and standardisation of data. Data is fundamental for urban planners to understand and determine where to deploy shared micromobility systems and to evaluate their impact. Without data on mode share and mode shift, it is not possible to understand which elements of the mobility system are impacting on others.

Knowing how to treat data and how new technology can help is a key challenge. Local authorities need to develop new expertise to be able to make use of the collected data. Shared scooters mushroomed on city streets and pavements, with policy makers having little insights into how, when and where these micromobility devices are being deployed and used and where these trips were displaced from. This lack of information and transparency from providers led to mistrust on both sides. Now that micromobility services are continuing to flourish in cities' landscapes and that operators appear increasingly willing to share data with cities, it is urgent to have accurate and up-to-date information. This seems to be a precondition to ensure that new mobility options effectively serve city goals, complement other modes and help to achieve Vision Zero. The collection of accurate and detailed accident data is key to this.

Many cities have understood this and are becoming increasingly sophisticated in understanding and specifying what data they need from micromobility providers. They even make it a precondition for micromobility operators to serve their markets. On the other hand, data should be treated carefully: it should be collected from operators only for explicit and specified purposes. Only the minimum data necessary to achieve the stated public purpose should be collected. To protect privacy of users, location data and relevant information should be provided by GPS and sensory equipment from the e-scooter rather than the user. Cities should require or encourage data sharing from operators with data types linked to well-defined public policy objectives. Cities should also ensure operators provide data in adequate quality and frequency to meet needs. Where feasible, it would be best to keep cycling and EPAC data separated from e-scooters data.

Cities should also give themselves the means to understand and implement standards and API frameworks that enable them to collect and analyse mobility providers' data. Third-party data aggregators can support cities in combining mobility data across a variety of modes, providing a holistic view of their transport systems. Data will provide cities with a powerful tool, helping them to oversee new services and offer them new possibilities, such as adopting dynamic caps on scooter fleets based on location. The Internet of Things (IOT) boxes on shared e-scooters collect data that can, for example, be used to track traffic flows, and provide information on the condition of infrastructure and intermodality. Therefore, agreements between providers of shared micromobility devices should include a modus operandi on the use of data collected during the rides. If cities lack capacity for data analysis, it is recommended to seek the support from third-party experts. There are companies that specialise in treating and presenting data about micromobility. As already experienced in some cities, students can also help to analyse sets of data and collect useful insights, which will feed into the planning strategy.

Data at the service of Antwerp's mobility planning (Belgium)

In Antwerp, the city works with licences for every provider of mobility in the city. The city's plan is to work with a modular size of the fleets in correlation to the needs of the users (such as inhabitants, commuters, tourists and students). Adjustments to the services provided will be made based on the data the city receives from the providers of micromobility.

Antwerp passed regulations ensuring that every provider needs to deliver his anonymised real-time data with API. Based on this data, the city makes informed decisions in function of the needs of its users. The means of transport that require more capacity are allowed to expand their fleet, while other means of transport that are not used enough will have to reduce their fleet. With this data at the city's disposal, Antwerp can make these decisions for every part of the city.

Pros and cons of regulations for micromobility	
Regulations offer the following opportunities	**Regulations include the following downsides**
Protect public space by implementing dedicated zones (such as no-go zones, no-park zones).	Limit the number of providers, which could limit the competition (prices could rise).
Impose quotas to prevent overload and ensure vehicles are made available in certain areas.	Limit the service to the customer.
Impose additional measures on top of traffic regulations to increase safety.	
Protect other stakeholders, then users and providers.	

Pros and cons of soft measures for micromobility	
Soft measures offer the following opportunities	**Soft measures include the following downsides**
Speak with providers and let them come up with their own plans for reducing nuisance.	Providers will always safeguard their economic interests and soft measures are not an obligation.
Less red tape and fewer resources required for tender and licensing procedures.	Cities cannot claim the rules they want, which can lead to problems (for example, too many vehicles and parking issues).
Greater flexibility for operators to come to new cities and leave markets if necessary without penalties.	It is difficult for cities to do long-term transport system planning that would involve micromobility when there is less influence over the operations.

5. The eight SUMP principles in the context of micromobility

In this chapter we clarify how the safe use of micromobility devices relates to the eight SUMP principles. These principles are:

1. Plan for sustainable mobility in the 'functional urban area'.
2. Cooperate across institutional boundaries.
3. Involve citizens and stakeholders.
4. Assess current and future performance.
5. Define a long-term vision and a clear implementation plan.
6. Develop all transport modes in an integrated manner.
7. Arrange for monitoring and evaluation.
8. Assure quality.

In the following paragraphs, you can find the crucial elements in each SUMP principle in relation with the policy focus of this Topic Guide: the safe use of micromobility devices in urban areas.

Figure 1: The eight SUMP principles (Source: Guidelines for developing and implementing a Sustainable Urban Mobility Plan, Second Edition, 2019)

5.1 Plan for sustainable mobility in the 'functional urban area'

The starting point of the SUMP process is committing to the overall sustainable mobility principles, going beyond the simple municipal boundaries. Taking measures to improve the use of micromobility can improve sustainability in related areas (such as air pollution and public health) and could become an important contributor to the city's mobility landscape. Such services were often introduced without consultation and with minimal direction from urban planners and leaders. Nevertheless, micromobility can further help to realise a city's sustainability goals by improving congestion, complementing public transport and reducing individuals' carbon footprint. As an electric or active form of transport, micromobility (using clean energy sources) has the potential to reduce urban transport emissions if it replaces motorised transport modes[39].

Micromobility devices are convenient for short trips and represent a solution to first and last-mile journeys. In the context of EU's climate neutrality goal by 2050 and with mobility accounting for 40% of CO_2 emissions in Europe, the potential environmental benefits of micromobility should not be understated. However, it is important to plan carefully and focus on replacing private car trips with journeys made using micromobility vehicles. Sustainable mobility benefits of micromobility depend on the type of trip that is displaced.

5.2 Cooperate across institutional boundaries

Cooperation and consultation across different sectors of government and relevant authorities is crucial. Lack of cooperation and coordination between different stakeholders makes the implementation of a good regional and local urban mobility strategy very difficult. This is also valid for micromobility.

Shared micromobility requires a strong integrated approach, combining public strategies and private sector interests. Therefore, a close cooperation with private partners, such as micromobility operators, will be needed, from the start to the end of the planning process. Integration with the public transport authorities and operators is also relevant.

When it comes to controlling free-floating operators, it is important to define and adapt the most appropriate level of authority to organise it, whether at regional or local level for instance.

[39] A recent study (*https://www.intelligenttransport.com/transport-news/97295/voi-and-ey-release-life-cycle-assessment-of-e-scooters/) on the life cycle assessment Life Cycle Assessment (LCA*) of an e-scooter in use in a major city in Europe finds that e-scooters with swappable batteries generate 34.7 g of CO2 equivalent emissions per person per kilometre across the full life cycle. On the other hand, a new petrol car will generate between 200g and 350g of CO2 equivalent per person per kilometre.

5.3 Involve citizens and stakeholders

Citizens and relevant stakeholders are crucial partners in building a strong approach for micromobility. As users of the transport system, citizens' behaviour needs to be assessed and guided (for example, getting users to comply with traffic law and respect public space). Any effective approach should clearly focus on the road users and those who are not e-scooter users but whose confidence and mobility is affected by their presence on the streets.

For shared micromobility, stakeholders from the public and the private transport sector are important to push a safe organisation and to inform and convince citizens to participate in the transport system in a safe way. In cities where licences that allow operators to offer their shared micromobility devices are not required, cities will find it difficult to manage the operation of these services. In such situations, good negotiation and cooperation with micromobility operators is key.

Before involving and discussing with relevant stakeholders and citizens, urban planners should regularly update and carefully tailor their scenarios to the constantly evolving landscape of micromobility. They should have defined a clear city vision supporting the city's goals, that they then submit to all stakeholders for consultation. As part of this process, coordination between different transport modes and their relevant stakeholders is also crucial.

5.4 Assess current and future performance

To successfully drive the micromobility strategy of a city, urban planners need to understand, for example, what the state of play is in their city, what the numbers are, how to interpret the statistics, what the business model is. Urban planners should also understand for what type of trips and under which conditions people use micromobility devices in their city (for example, who are the main users and which trips need to be replaced).

It is also essential to define ambitious and measurable targets derived from agreed future objectives aligned with a vision of mobility. In doing so, urban planners should define clear indicators and analyse the modal shift strategy on a regular basis.

A city's environmental footprint should be measured yearly, be more ambitious and make the best use of micromobility with the goal of moving towards more sustainability in the transport system.

Understanding the role and place of micromobility in the whole multimodal transport network is crucial to assess the current performance of micromobility devices and determine future actions and targets. This is valid for instance in terms of road safety: understanding where and how collisions happen and which user groups are involved will help to define effective and specific road safety interventions in the urban area covered by the SUMP. This can be done by launching urban road safety audits (for example, using safety performance indicators that can be correlated with a SUMP).

5.5 Define a long-term vision and a clear implementation plan

At the start of the urban mobility planning process, it is important to define long-term objectives for micromobility for trips in a specific area. The mobility offer can then be developed according to those objectives, taking into consideration the needs for commuting, carbon footprint, accidentology and inclusive offers (such as gender, disabled users and

seniors). When offering alternatives for trips, distance, climate (seasonality very hot/cold weather), temporality, risks and advantages of higher uptake of micromobility, alternatives for making the same trip, should all be analysed.

Regarding shared micromobility, before authorising operators to deploy shared fleets, cities should analyse their mobility goals carefully and select the most appropriate duration for permits to match innovation with sustainability. It is also recommended to involve micromobility operators in the earlier phase of the SUMP process.

5.6 Develop all transport modes in an integrated manner

How to accommodate new modes in the transport system? This is a well-known dilemma of urban planners, especially when it comes to micromobility. The whole road network should be made safe for micromobility to work. Dedicated bicycle lanes are just part of the solution, considering the full extent of the network. Moreover, existing bicycle lanes might have been crowded even before the arrival of micromobility devices, and some may not be safely usable given the differences in vehicles handling and qualities (for example, not suitable for the small wheels of micromobility devices).

For micromobility, the first focus should be to define which authority should be in charge of dealing with micromobility and operators and deploying these services as a useful alternative in the whole transport system. Micromobility has a strong interaction with the other modes along the network and in the nodes of the multimodal network. Planning for the safe use of micromobility devices implies at the same time discussing the functioning of other modes: urban planners cannot make it safe for one mode without considering the whole system, especially not when it comes to micromobility: users of micromobility can potentially endanger pedestrians but at the same time, they are potentially endangered by motorised vehicles such as cars and trucks, for example. There are also more players to be considered in this equation – all types of public transport (where each of them interacts with micromobility devices differently), trucks, motorcycles, mopeds on the cycle paths, emergency vehicles – urban planners need to see the transport system in the city as a whole.

5.7 Arrange for monitoring and evaluation

A city needs a well-structured and transparent monitoring and evaluation strategy, with indicators measuring progress and identifying the successes and areas for improvement. Like for other modes of transport, the definition and adoption of a clear set of specific indicators, accompanied by a feasible data collection strategy, is a prerequisite for monitoring and evaluating the safe use of micromobility devices in urban areas.

Shared micromobility provided by private operators requires new forms of control. Information systems have been planned according to traditional modes of travel, allowing new forms of travel to be compartmentalised into an inadequate category, such as e-scooters as bicycles. The problem can occur, for example, in accident statistics and in hospital patient systems. When accident data is not available for use by local authorities, it is difficult to apply improvement measures to problem spots. Bicycles, EPACs and e-scooters need to be monitored and evaluated in different categories when possible.

When new modes of movement are coming into use like micromobility services, different authorities should cooperate at an early stage to bring monitoring into place as quickly as possible. Cities should also set up dedicated expert teams to regularly monitor the compliance of operators with the rules and guarantee the quality and safety of service provided to users and to non-users also affected by micromobility vehicles on the footpaths.

5.8 Assure quality

The involvement of operators, citizens (users and non-users of micromobility) and stakeholders - including associations for blind and disabled people, to create awareness and determine the governance framework for micromobility is clearly key for the quality of the process. Another crucial element for quality is the evaluation framework of the impacts of micromobility. Exchanging lessons learnt with other cities can also avoid repeating mistakes and increase the quality of the process, while supporting the creation of a common understanding and vision across geographical and administrative boundaries.

Urban planners should think carefully about how to involve key partners in feedback procedures and how to measure the impacts of micromobility. They should look for advice and best practice examples. While preparing a SUMP, it is essential to involve micromobility experts, including operators.

6. Considering micromobility in the SUMP steps

In the following, the main actions and elements essential for implementing a safe use of micromobility are introduced, reflecting the phases of the SUMP cycle. We identify crucial aspects and recommend concrete actions to the general guideline cycle to encourage urban planners to better integrate micromobility in their SUMPs.

This Topic Guide gives advice to policy makers and involved stakeholders on how to integrate micromobility in almost every step of the planning cycle of the SUMP. Its objective is to put micromobility high on the agenda while developing and implementing a SUMP and to ensure urban planners are fully aware of the importance to integrate it in the whole transport system, for the overall success of the SUMP.

Figure 2: The 12 Steps of Sustainable Urban Mobility Planning (2nd Edition) – A decision maker's overview (Source: Guidelines for developing and implementing a Sustainable Urban Mobility Plan, Second Edition, 2019)

6.1 Phase 1: Preparation and analysis

Figure 3: Phase 1: 'Preparation and analysis' (Source: Guidelines for developing and implementing a Sustainable Urban Mobility Plan, Second Edition, 2019)

In the first phase of a SUMP, a few actions are recommended to prepare the process, in relation to the set-up of the working structures and the planning framework, as well as the analysis of the mobility situation. Internally, the city should first set up an interdepartmental core team, which will analyse problems and opportunities and define a vision for the city.

When analysing the mobility situation, it is important to assess the availability of micromobility services and their level of integration, but also the market situation and national policies, and technological readiness of the urban area that is about to implement rental/shared micromobility devices.

The core team should define a comprehensive plan for stakeholder and citizen involvement. With this plan, the city should aim at bringing together the various stakeholders. Since micromobility integrates public and private-led services, there is a need to set up a structure enabling cooperation and dialogue with all stakeholders from the micromobility sector, including newcomers. Shared micromobility operators are part of a new mobility culture that requires an adequate and dedicated discussion platform. A continuous and open public-private dialogue is recommended within and beyond the SUMP process.

After a wider consultation and analysis of problems and opportunities, the city and stakeholders should build a common vision, including incentives, risk and profit sharing, ensuring that every stakeholder can benefit. It is important to develop a culture of trust and to identify the potential benefits for each stakeholder.

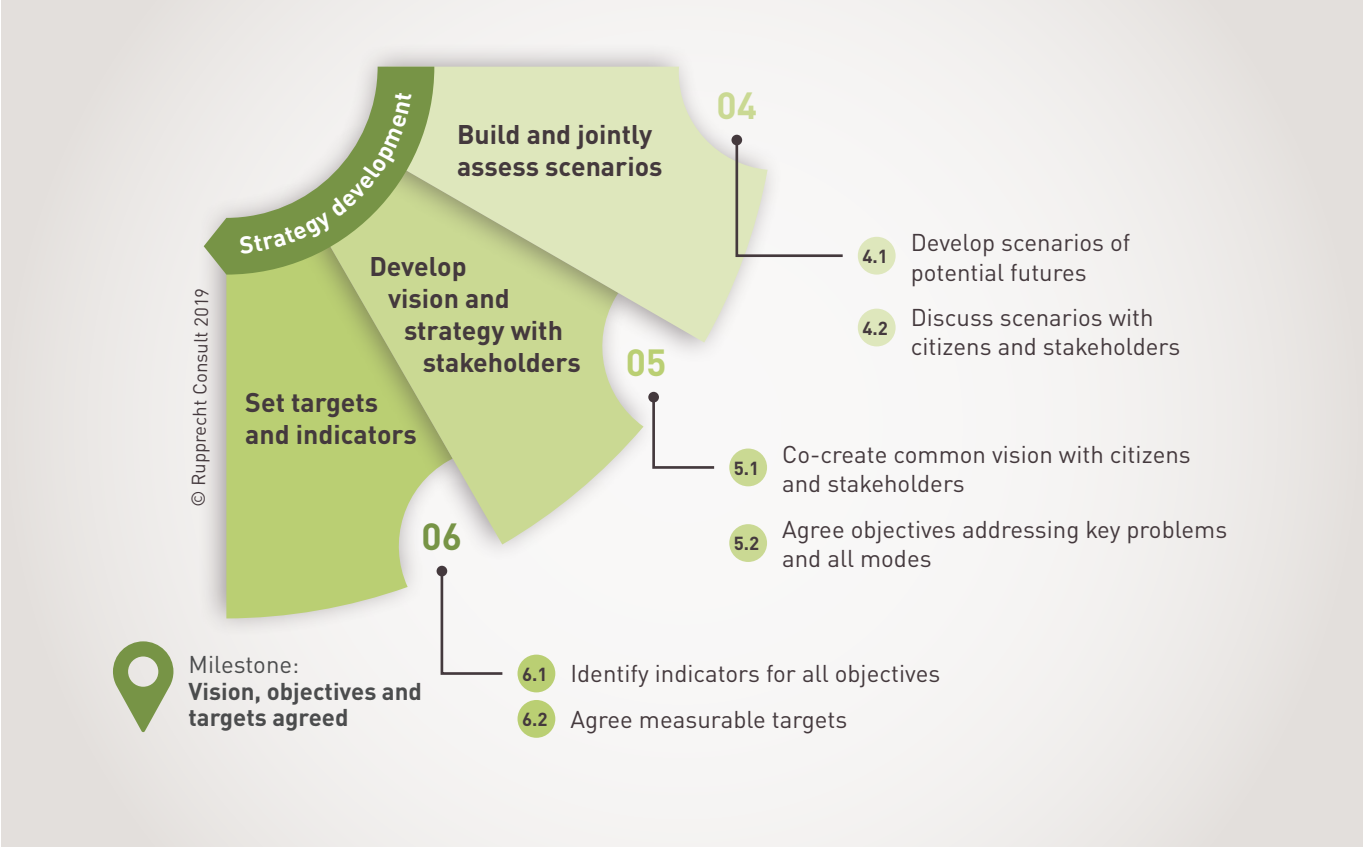
Availability and sharing data is crucial for well-informed planning and decision-making procedures. Identifying

information sources and cooperating with data owners like shared micromobility operators is key. To that end, working with open data and architectures as well as standard interfaces are valid options. Data reciprocity can be imposed as a principle, from one side to improve the service level and usage of micromobility services and, from the other side, to have access to up-to-date information for urban planners.

The use of customer data should always be treated in compliance with the relevant legal requirements such as the GDPR.

6.2 Phase 2: Strategy development

Figure 4: Phase 2: 'Strategy development' (Source: Guidelines for developing and implementing a Sustainable Urban Mobility Plan, Second Edition, 2019)



In the second phase of a SUMP, several actions are recommended to prepare the process, particularly in relation to building and jointly assessing future scenarios, developing a common vision and objectives with stakeholders as well as setting targets and indicators. The stakeholders and citizens involvement plan agreed in Phase 1 is the basis for the active involvement of those categories and decision-makers to create a common vision leading to a strategy.

The local planning framework for implementing the individual and shared use of micromobility should be discussed according to the possible and desired governance and operational models as described in chapter 2, based on a participatory approach. This process could result for example in an agreed code of conduct or charter.

Cooperation frameworks in European cities

- Paris code of conduct (see more details in dedicated box below).
- Dublin byelaws for dockless bike-share.
- Madrid sustainable mobility ordinance.
- Flemish/Dutch framework for free-floating bike-share.

The challenge for the city is to get all stakeholders to work together towards a common goal, which should be a modal shift towards sustainable mobility without endangering vulnerable groups. Public authorities need to ensure that links with public transport, cycling and walking are at the core of any micromobility strategy to avoid the risk of an adverse modal shift. This new type of mobility, usually 'door to door', should not discourage active mobility. Citizens are widely taking up micromobility devices as they satisfy their type of needs. Putting different perspectives together may show well that there are very different interests and driving forces around further upscale of the micromobility solutions; which makes policy necessary to align potential conflicting interests.

Moreover, the safety of the most vulnerable groups like the elderly or disabled people must be taken into account and services designed with this in mind. This means for example that footpaths must remain safe walking spaces where motorised vehicles are not allowed to be used.

Regardless of the role the city and/or region and its administrative bodies in micromobility implementation, defining the overall strategy for micromobility is and should remain the responsibility of the public authorities, in an open dialogue with all stakeholders. Key objectives might be, for instance, to increase the use of more environmentally friendly and efficient mobility options, reduce private car use/ownership, reduce the distance travelled by car (whether own car, taxi or shared vehicle), improve mobility and access, influence users' travel behaviour, engage the users in socially responsible behaviour within the community, and improve air quality and the health of citizens.

It is paramount to create an evaluation framework with key performance indicators (KPIs) and measurable targets to be able to measure the impact of micromobility on travel behaviour against local transport policy goals.

Indicators used in Berlin (Germany)

The report on urban mobility in Berlin in 2017[40] illustrates traffic related developments in Berlin, including strengths as well as the need for action. It constitutes the basis for decision making and developing further the transport system.

The report proposes the following urban mobility indicators, used also for measuring micromobility:

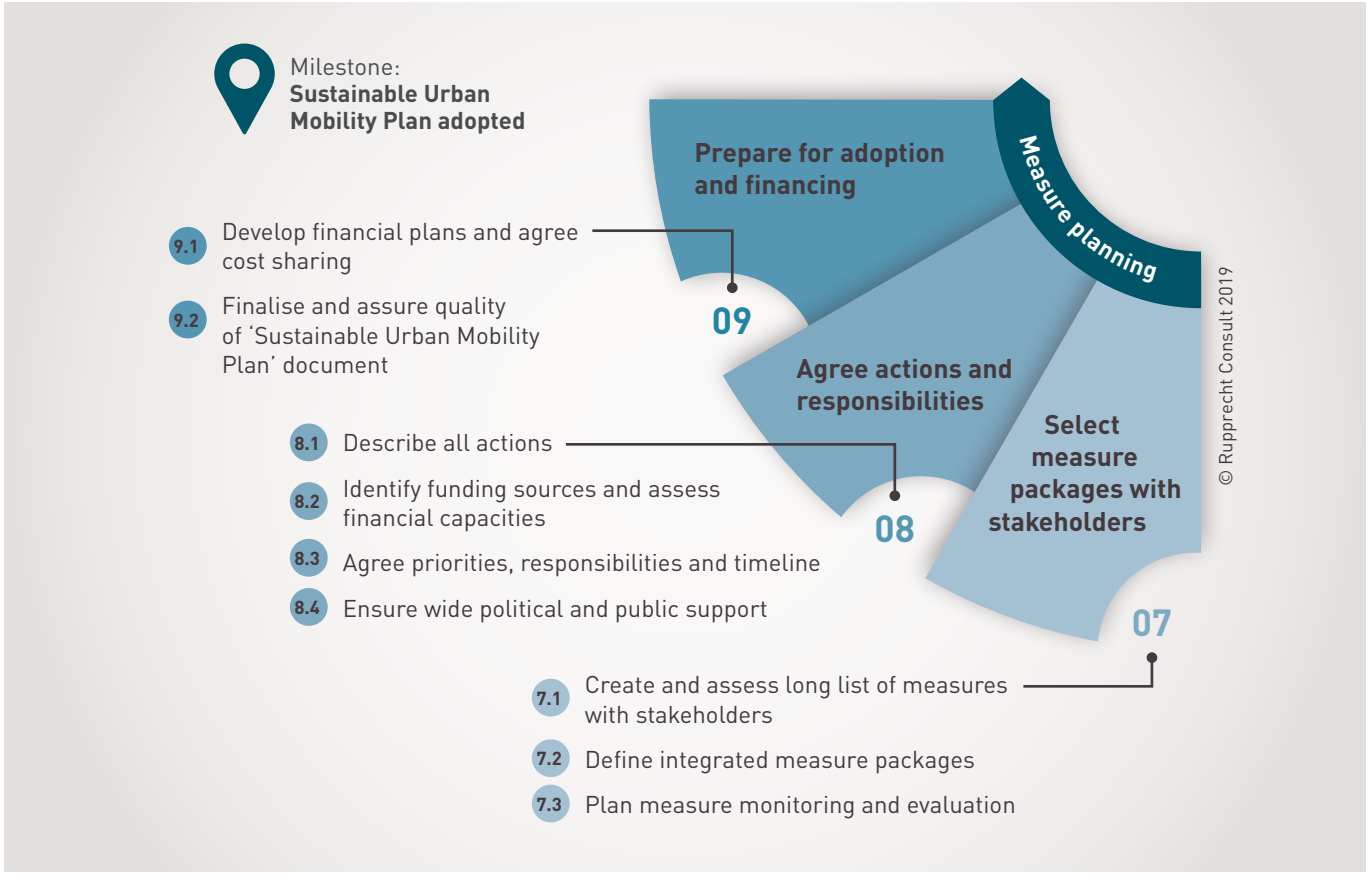
- structural data: such as inhabitants and working population per district, population development, people moving from and to Berlin from the surrounding area, monthly household income, population density;
- mobility profile: more recent survey with data from February 2018 to January 2019 (the brochure from 2017 includes mobility data from 2013; for this part of the survey, new mobility data is collected every 5 years), including:
  - average number of journeys of the residential population (per person and day);
  - average journey time and distance (respectively per journey and day);
  - level of motorisation of households;
  - rate of occupation (motor vehicles);
  - number of bicycles per 1 000 inhabitants;
  - modal split (walking, cycling, public transport, motorised private transport) for internal traffic and overall traffic;
  - modal split separated according to reasons for journeys (workplace, education, home, leisure, shopping/care, others);
  - modal split separated according to inner and outer city;
  - occupational commuters per working day from and to Brandenburg (federal state surrounding Berlin);
  - number of motor vehicles registered in Berlin;
  - share of motor vehicles;

  - further indicators for biking/cycling (building projects like crossings for pedestrians and infrastructure for cyclists, development of traffic census for bicycles), public transport (development of network of public transport, passenger numbers, vehicle fleet), motor vehicles (including development of car-sharing – free floating and with stations and freight transport).
- effects and framework of traffic: road safety (accidents according to accident consequences, types of road users involved, age of people involved), air quality, noise, costs and financing;
- sustainability: referring back to earlier chapters, goals:
  - strengthening sustainable modes: walking, cycling and biking;
  - at least maintain comparatively low level of private motorisation;
  - increase share of freight transport by train and inland vessel;
  - keep costs for maintaining and extending the transport system financeable.

[40] *https://www.berlin.de/sen/uvk/_assets/verkehr/verkehrsdaten/zahlen-und-fakten/mobility_en_komplett.pdf*

6.3 Phase 3: Measure planning

Figure 5: Phase 3: 'Measure planning' (Source: Guidelines for developing and implementing a Sustainable Urban Mobility Plan, Second Edition, 2019)



In the third phase of a SUMP, the following actions are recommended to prepare the process: select measures packages with stakeholders, agree actions and responsibilities and particularly public funding. The result of this phase should be a clear list of actions with well-defined outputs indicating the timing and which stakeholders are responsible for each action. Actions and responsibilities in the shared micromobility implementation depend greatly on the role taken by key stakeholders (such as micromobility operators). The budget for each action should also be clear. As part of the SUMP development, financial plans should be agreed with key stakeholders, including key aspects such as cost sharing of shared micromobility service provision. Public funding could be made available by public authorities for trials and pilots to create awareness or to tackle technological obstacles and to finance studies to cover missing area of expertise. In addition, public funding could help to ensure the preconditions to the operation of micromobility services, such as supporting the interoperability of services or by developing multimodal hubs. In this regard, the option of shared micromobility services should also be included in journey planners.

Public authorities should adopt and harmonise quality standards for all new shared micromobility providers. They should participate in the standardisation procedures as well. Public authorities should also try to safeguard a level playing field amongst transport operators and prevent undesirable effects such as a shift from collective modes to individualised modes and creating new risks for the most vulnerable groups (for example, blind people tripping over toppled devices).

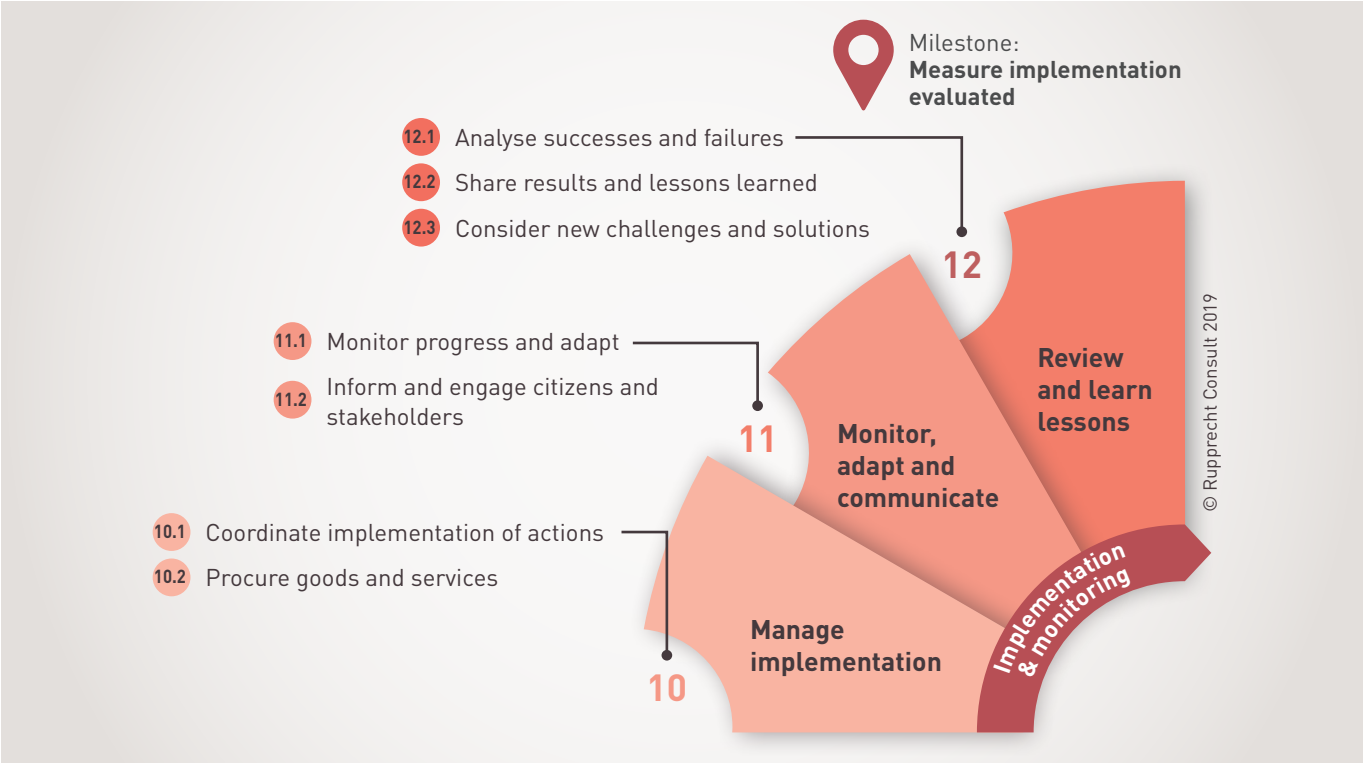
The safe use of micromobility devices in urban areas is a priority for the citizens, but also for local politicians. This is particularly relevant in light of road safety aspects: accidents involving micromobility users but also people with disabilities who might be endangered by these new types of devices are tragic and sensitive topics. Political action is often required to steer the

process towards safety improvements. Ensuring wide political support is therefore important, as well as public support and acceptance.

In that phase it is key to ensure that micromobility is part of integrated measure packages. It is an opportunity for public authorities to move away from traditional traffic management towards multimodal mobility management, and to ensure that a more integrated and systemic management approach is put in place.

6.4 Phase 4: Implementation and monitoring

Figure 6: Phase 4: 'Implementation and monitoring' (Source: Guidelines for developing and implementing a Sustainable Urban Mobility Plan, Second Edition, 2019)



In the fourth phase of a SUMP, several actions are recommended to prepare the process. These actions relate particularly to the procurement step and to the creation of relevant organisational structures that will manage the implementation. This last phase is also crucial in terms of monitoring, adapting and communicating about measures.

Taking into account the high public sensitivity linked to shared micromobility services, this phase seems very important to steer continuously the implementation of effective measures, including road safety ones. Communicating, but also educating users on the safe use of micromobility devices and raising awareness among drivers of their interactions with micromobility device users are other aspects to develop in this phase. In this regard, it would be useful to have a clear set of minimal rules or guidelines for educating users, for example Ride like Voila done by Voi and Vias[41]. Shared micromobility offers develop extremely fast, that is why a responsible and sustainable choice of innovation should be privileged when signing contracts with selected operators.

[41] Ride like Voila (English version): *https://www.youtube.com/watch?v=k4gURNYPznk*

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