



TOPIC GUIDE

PLANNING FOR ATTRACTIVE PUBLIC TRANSPORT



Imprint

About:

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Title

Topic Guide: Planning for attractive public transport

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Guide to the reader

This document provides guidance on public transport in the Sustainable Urban Mobility Planning (SUMP) and implementation process in order to achieve more attractive public transport.

It applies the concept of SUMP, as outlined by the European Commission's Urban Mobility Package¹ and described in detail in the European SUMP Guidelines 2.0 (second edition)². It also reflects the Urban Mobility Framework's³ priorities for public transport, which aim to make sustainable transport modes, in particular public transport, attractive with the support of a multimodal approach, digitalisation and an enhanced connection with the TEN-T urban nodes.

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 the quality of life of citizens 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 needs and 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 of different levels of government with diverse groups of citizens, stakeholders, and private stakeholders. It also emphasises the coordination of policies between sectors (transport, land use, environment, economic development, social policy, health, safety, energy, etc.).

This document is part of a compendium of guidance documents, complementing the revised second edition of the SUMP Guidelines (SUMP Guidelines 2.0). They elaborate on difficult planning aspects in more detail, provide guidance for specific contexts, and focus on important policy fields. Two types of guidance documents are available: 'Topic Guides', which provide comprehensive planning recommendations on established topics; and 'Practitioner Briefings', which are less elaborate documents and address emerging topics with a higher level of uncertainty.



Currently, there are published guidance documents 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; Procurement.
- Contexts: Metropolitan regions; Polycentric regions; Smaller cities and towns; Neighbourhoods; National support.
- Policy fields: Safety; Health; Energy (SECAPs); Logistics; Walking; Cycling; Parking; Shared mobility; Mobility as a Service; Intelligent Transport Systems; Electrification; Access regulations; Automation; Resilience; Social impact assessment; Gender and vulnerable groups; Micromobility; Urban Air Mobility.

They are part of a growing knowledge database that will be regularly updated with new guidance documents. The latest documents are always available in the 'Mobility Plans' section of the European Commission's urban mobility observatory [Eltis](http://www.eltis.org)⁴.

¹ Annex 1 of COM(2013) 91.

² Rupprecht Consult (editor), Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan, Second Edition, 2019.

³ https://transport.ec.europa.eu/system/files/2021-12/com_2021_811_the-new-eu-urban-mobility.pdf

⁴ www.eltis.org

Executive summary

This Topic Guide highlights the ways in which cities can make public transport more attractive through SUMP's to trigger behavioural change in favour of public transport. The document also aims to increase the use of public transport in line with the priorities of the new EU Urban Mobility Framework⁵ and the European Green Deal⁶.

Public transport is a public good. It is an essential service, as pointed out in the European Pillar of Social Rights (principle 20)⁷, and delivers benefits in terms of transport efficiency, pollution reduction, the local and national economy, territorial accessibility and social inclusiveness. It is key for connectivity with peri-urban and rural areas. Public transport is also vital to the recovery of the European economy: in addition to connecting people to jobs, it also creates local jobs. The public transport sector is amongst the largest employers at local level, employing 2 million people in the EU, i.e. 20 percent of the 10 million people employed in the overall transport industry⁸.

Cities of the future will be dependent upon an accessible, safe, secure, affordable and reliable public transport backbone, with efficient public transport interchanges between the urban nodes of the Trans European Transport Network (TEN-T)⁹. In the new Urban Mobility Framework, the European Commission calls for urban nodes in the TEN-T network to develop SUMP's that aim to increase the use of public transport and promote the strengthening of this form of transport throughout cities and regions. To move in this direction and adapt their public transport offer, cities will need to actively engage with a wide range of stakeholders (e.g. public transport authorities and operators, diverse groups of passengers, data experts, etc.) and use innovative co-creation methods to improve the overall public transport offer and its attractiveness based on different users' needs and expectations.

While the accessibility of public transport has improved in cities, more needs to be done to increase its quality, accessibility for persons with disabilities and ensure better integration between public transport and shared and active mobility services, including micromobility services, in order to cover the last mile where access points are either far away or the frequency of public transport is low. Intermodal hubs, including park and ride facilities, encourage passengers to use public transport. This will contribute to the reduction of the need to use motorised vehicles and thus reduce congestion. Furthermore, public transport and shared mobility services should complement each other. In some cases, shared and on-demand mobility could

become part of public transport, particularly in rural areas, integrated under Mobility as a Service models.

During the COVID-19 pandemic, the popularity of public transport ridership fell, while other modes rose, such as cycling, walking, but also car use. Even in the aftermath of the health crisis, many factors have played a key role in the slow growth of ridership figures. These include changes in lifestyle due to working from home and more localised travel behaviour. In addition, many public authorities have discouraged the use of public transport and introduced health protocols, leading to the loss of public transport passengers. A key challenge will be to regain trust in public transport and re-establish its market share, by inducing private car users to return to public transport and by attracting new users.

Cities will need to become more adaptable and resilient to handling disruptions, uncertainties and their impacts. Not only the pandemic, but also the climate and the energy crises represent an opportunity to re-imagine mobility within cities, putting citizens at the centre. Cities can only become climate-neutral and more energy-efficient if planning and design give a high priority to public transport as well as active mobility, such as walking and cycling.

All these key aspects of public transport should be better reflected when designing and implementing SUMP's.

This Topic Guide offers support to mobility practitioners and local authorities in understanding how transport

⁵ https://transport.ec.europa.eu/system/files/2021-12/com_2021_811_the-new-eu-urban-mobility.pdf

⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/DOC/?uri=CELEX:52019DC0640&from=EN>

⁷ https://ec.europa.eu/info/strategy/priorities-2019-2024/economy-works-people/jobs-growth-and-investment/european-pillar-social-rights/european-pillar-social-rights-20-principles_en

⁸ <https://cms.uitp.org/wp/wp-content/uploads/2020/08/PUBLIC-TRANSPORT-IS-CRITICAL-FOR-EUROPEAN-RECOVERY-FINAL-VERSION.pdf>

⁹ https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment/trans-european-transport-network-ten-t_en

planning can better include public transport for a shift towards more sustainable modes of transport. It proposes a selection of 15 key messages on planning for attractive public transport and includes a variety of good practice examples from all over Europe, highlighting the benefits of a better integration of public transport into SUMP.

The first section of the document introduces the concept of public transport attractiveness and the importance of integrating public transport into the SUMP procedure. The second section addresses specific public-transport-related themes such as understanding demand, improving the quality of public transport services, making the public transport system resilient, giving it a more attractive identity, and looking into new financing options.

15 key messages on planning for more attractive public transport in your city

1. Assess your current situation, understand the needs of users and potential users, but also monitor and measure the success of policies and improvements – modal shares, accessibility indices, user satisfaction, etc. Anticipate the need for specific indicators and requirements on SUMP for the TEN-T urban nodes.
2. Apply a whole-city approach to public transport planning through urban development oriented to public transport and active mobility, and by integrating public transport physical planning, fares and operations.
3. Widen the scope of your SUMP by taking into account linkages with surrounding peri-urban and rural areas and embrace the needs of citizens living in more rural areas, e.g. commuters. To do so, better integrate public transport and land use planning, and develop complementary solutions to public transport such as multimodality hubs with park and ride facilities, shared mobility and on-demand mobility, including demand responsive public transport and MaaS.
4. Enable better governance of public transport with the creation of a single regulatory authority covering the full functional area, including peripheral areas, and coordinate with the regional authorities. Apply cross-sectoral governance by cooperating with other sectors (health, education, etc.).
5. Provide good quality mobility options characterised by frequent, reliable and integrated services, also focusing on speed, affordability and value for money.
6. Adapt public transport infrastructure, fleets and services to ensure better accessibility, focusing on vulnerable groups in a wider sense.
7. Improve travel experiences and tailor public transport services to meet individual users' needs, rather than mass transport. For example, in the post-pandemic era, passengers would like more flexible fares to match their current less-frequent commutes, that often do not justify a monthly subscription.
8. Design your SUMP with public transport as the backbone of urban development and your sustainable mobility system. In addition to moving towards cleaner fleets, decarbonising your public transport system should be viewed in the context of the "avoid-shift-improve" principle to successfully transform the transport system: avoiding unnecessary traffic, shifting to the most sustainable modes of transport (i.e. public transport, walking and cycling), and improving each mode of transport.
9. Align your SUMP priorities for public transport with those of other local and regional plans, including SECAPs (Sustainable Energy and Climate Action Plans), to ensure the same vision is put in place and pursued consistently.
10. Safety and security come first as an unspoken priority or condition sine qua non to travel. Maintain a high safety culture to protect the general public, children and vulnerable users and attract new groups of people to public transport.
11. Review the amount of road space disproportionately allocated to private cars and increase the amount of road infrastructure dedicated to segregated priority lanes for public transport. Road space reallocation should also consider active and shared mobility infrastructure: dedicated public transport infrastructure should be designed in relation to the infrastructure for cycling, walking and shared mobility services, to optimise a modal shift towards more sustainable modes of transport.
12. Make more and better use of new technologies, such as smartphone applications, to make public transport services more attractive and easier to use, thus supporting a behavioural change of travellers. It is important to ensure that this is not an obstacle for other groups of users, those with low digital literacy or access to IT tools. New technologies allow for integrated and multimodal information and ticketing, while at the same time improving data collection.
13. Take advantage of the pandemic and move towards greater resilience, which will ultimately contribute to reducing public transport costs. Anticipate events like pandemics, e.g. by designing more contingency plans.
14. Ensure the financing of your public transport system, even in times of pandemics, by integrating public transport into long-term transport and urban development strategies. The creation of new stations and connections also generates many investment opportunities, for instance for land value capture, where improved public transport facilitates development potential.
15. Give your public transport an attractive identity. For a more positive experience and image of public transport, the emphasis should be put on the experience – both in and around stations and on public transport vehicles, e.g. the ability to relax, sleep, work, shop, etc. while travelling.

1. Introduction

1.1 Objectives of this Topic Guide

The main objective of this Topic Guide is to provide planning recommendations for practitioners dealing with public transport. This includes both policy makers and planners working in the field of urban transport, as well as consultants that support them.

This Topic Guide has a policy focus that concentrates on public transport in the Sustainable Urban Mobility Planning (SUMP) and implementation process in order to achieve more attractive public transport. It delivers on the commitments of the new EU Framework for Urban Mobility¹⁰, which outlines the following main messages in support of public transport:

- The transition to safe, accessible, inclusive, smart, resilient and zero-emission urban mobility requires a clear focus on active, collective and shared mobility underpinned by low- and zero-emission solutions. It therefore calls for increased and accelerated action and new investments.
- There is a need to adapt the urban public transport infrastructure and services to ensure better accessibility, including to better serve an ageing population in many cities as well as persons with disabilities or reduced mobility.
- Public transport must be at the centre of sustainable urban mobility planning, be available and attractive to all and offer barrier-free access. It should maintain a high safety culture to protect the general public, children and vulnerable users and attract new groups of people.
- Public transport planning should also address connections with areas outside the city centre, including connections to the suburbs and rural areas beyond the city. It can be complemented with shared and on-demand mobility solutions.
- There needs to be a greater focus on the digitalisation and automation of tram, bus, urban rail and metro services.
- Digital multimodal solutions are instrumental in increasing the attractiveness of public transport. Therefore, Mobility as a Service (MaaS) apps need to be developed with public transport as the backbone.



- Urban nodes in the TEN-T network should develop SUMPs that support the use of public transport throughout cities and regions.
- As part of the TEN-T, urban nodes are required to make it possible for passengers to access information, book and pay for their journeys, and retrieve their tickets through multimodal digital mobility services, allowing public transport to be the backbone of collective mobility in urban nodes by 2030.
- The European Commission calls on Member States to conduct their related procurement procedures to prioritise innovative, digital, accessible, sustainable and multimodal solutions.

All of the above-mentioned aspects are firmly established in the SUMP framework and are reflected in this document. Brought together into SUMP, they should contribute to a more attractive public transport system, and thus increase its use by all in cities and beyond.

In this Topic Guide 15 key messages are proposed to make public transport more attractive through sustainable urban mobility planning, illustrated by a set of best practice examples and case studies.

¹⁰ https://transport.ec.europa.eu/system/files/2021-12/com_2021_811_the-new-eu-urban-mobility.pdf

1.2 What makes public transport attractive?

Public transport attractiveness can be understood through modal shares or ridership and how much people use it and are satisfied by it. It relies on a set of factors that are directly related to public transport provision (hereafter called 'internal factors') and a set of factors that are not directly related (hereafter 'external factors'). That is why SUMP is so important for public transport attractiveness since it can act on both the internal and external factors.

Internal factors may include:

- Service quality:
 - Increasing service supply including coverage (in terms of network but also amplitude i.e. early & late services), on-time performance (improved reliability leads to increased ridership), reliability of service, ease of use, comfort, (multimodal) travel information and ticketing, frequency of service, has traditionally increased ridership.
 - Focusing on inclusiveness and accessibility will also attract more users, including Persons with Reduced Mobility (PRMs) and persons with a disability in particular, and for vulnerable groups such as children and young people; older people; migrants and ethnic minorities (not understanding the language); low income and unemployed; people living in rural and deprived areas; persons with no or little IT skills and persons with no access to internet.
- Redesign of the bus network and urban rail: increasing ridership, largely through increased travel speeds and increases in service.
- Prioritising public transport in the form of Bus Rapid Transit (BRT) or light rail (with features such as dedicated right-of-way, priority at crossroads and a higher commercial speed) can greatly increase ridership.
- Fare increases: will modestly decrease public transport ridership if the service remains unchanged. Price elasticity shows that riders are generally more respondent to transport quality than price changes.

- However, integrated or seasonal (e.g. monthly, annual) tickets can increase ridership through the development of a loyal customer base.
- Targeted fare discounts as a means of marketing or introducing mobility services to potential clients/passengers, e.g. students, can increase ridership.
- It seems that more flexible fare policies are needed to meet new (tele)working practices, e.g. discounts for frequent but irregular public transport use that go beyond the traditional monthly pass and ensure that commuters, who have many options and make fewer trips choose public transport as often as possible.
- Free public transport is increasingly being considered and generates a lot of media attention. Cities such as Tallinn, Dunkerque, Hasselt, but also countries such as Luxembourg, have implemented long term free public transport schemes, and their overall results have been much debated. While free transport access in order to stimulate riders may have short-term benefits, permanent schemes have not demonstrated clear benefits for the sector or sustainable results¹¹ (see case study below).
- Awareness-raising: informing and educating people about the public transport offer, and better marketing and promotion e.g. through campaigns, can significantly increase ridership.
- Connectivity for people living far from a public transport station or hub: safe park-and-ride facilities as well as bike-parking places, bike-sharing points at public transport stations, but also shared mobility solutions, taxis and walking infrastructure, provide integrated solutions for the entire journey.

External factors may include:

- Demographic trends: with the ageing and retirement of baby boomers, commuters' ridership is decreasing.
- Car ownership: it seems that car ownership rather than income is a determining factor (including 'company cars') which blurs people's appreciation of the real cost of transport.

¹¹ UITP (2020) Full Free Fares Public Transport: Objectives and Alternatives, UITP Policy Brief

Mixed results of Estonia's free public transport

- Recently published on the Eltis website, the National Audit Office of Estonia investigated the results of free public transport introduced in Tallinn, including free bus and tram travel for local registered people. The analysis included studying whether the economic feasibility, as well as the mobility needs of people, had been considered when deciding to cut payment by users. The results based on a county model suggested that free public transport had not reached its goal to reduce car journeys. Whilst public transport use had increased, still more than half of all trips to work are by car. "What is positive is that the decline in the share of public transport users stopped for a couple of years," stated Auditor General Janar Holm. "Unfortunately, not a significant number of new users have been attracted to public transport despite the fact that over recent years the state has allocated more and more funds to cover the costs of county bus transport and allowed people to travel by bus free of charge in most counties."
- Furthermore, the National Audit Office found that funding for public transport services was unequal between Estonian counties and state expenditure to fund public transport had risen rapidly. "In a relatively short period of time, the costs of county public transport is expected to triple," Auditor General Janar Holm said. The Public Transport Act bears no clear distinction between county and local services. Consequently, responsibilities are negotiated based on different results with some municipalities relying mostly on county services and others having to organise services themselves in their area. "It is not just a question of money, but of equal treatment of municipalities, and if it is not clear who has to organise bus services and pay the costs, important bus lines may be left unopened altogether due to disputes, or reasonable changes not made to optimise the route network," Holm added.



Source: City of Tallinn

- Additionally, it was found that the bus network had not been designed to meet people's mobility needs, since it had been planned from the point of view of current public transport users only. Consequently, the needs of car users should be considered when designing future public transport services to offer an attractive alternative to car travel.

The National Audit Office recommends that the responsible Minister of Economic Affairs and Infrastructure should:

- encourage authorities to consider alternatives to regular bus lines such as on-demand services in sparsely populated areas;
- base the further development of public transport services on the actual demands of all possible customers including today's car drivers;
- set out a clear and equal funding system for county public transport;
- create an information system to assemble public transport data as well as a common ticket system nation-wide.

- Built environment: in a denser environment, car ownership is relatively low and public transport use higher, while in less densely populated areas, urban sprawl and an inadequate public transport offer lead to forced car ownership.
- Fuel prices: when these increase, they also contribute to public transport ridership.
- Employment levels: when employment levels rise, public transport use also rises – but so does car use.
- Teleworking, part-time employment, and online shopping trends will continue to decrease public transport's potential market. They will require different public transport policies (e.g. ticketing) and improved urban logistics.

The following issues are external factors, but they are within the remit of transport planners:

- Car travel: when it is made difficult or unattractive – simply through congestion charging, Urban Vehicle Access Regulations (UVARs), taxes or more balanced road space reallocation and parking policies supporting more sustainable modes – public transport use increases.
- Impacts of new mobility services – such as ride-hailing, bike-sharing, and car-sharing – are as yet unclear (while many studies exist, little data is available); strategic partnerships are needed to reduce the negative impact on public transport ridership and maximise benefits for users.
- People's mobility practices can be influenced by demand management policies and environmental awareness raising to increase public transport ridership.

The reality of public transport ridership is complex. The relative importance of various factors and the interaction between them is not fully understood and may depend on the geographic location or the specific characteristics of the urban area. However, what is clear is that public transport can be made more attractive through strategic plans that tackle a combination of the elements listed above.

The COVID-19 crisis clearly affected public transport, its attractiveness and how it is delivered with swift reactions and measures put in place by operators and authorities. The EU has been supporting cities with

guidance¹² to tackle related challenges, e.g. guidance on how to safely resume travel and reboot Europe's tourism in 2020 and beyond, and a SUMP Topic Guide on more resilient and robust urban mobility¹³. COVID-19 led to social distancing in vehicles and stations, accompanied by different measures to reduce crowding, manage occupancy and “flatten or shift the peak”, thus reducing the morning or afternoon passenger load and distributing it more evenly across the day. This might have brought a more permanent demand for comfort by passengers and given operators the tools to ensure it, but it might also have come with higher costs. This is an example of how the previous operation of a public transport system can be disrupted, and how a new equation needs to be found.

In fact, the COVID-19 crisis triggered a fast change in mobility patterns (with uncertainty about their stability), a revenue crisis, as well as a need for quick and agile responses to guarantee safe mobility, protection of staff and infrastructure (through, for example, the adaptation of mobility assets such as roads and services)¹⁴. Public transport also suffered from a loss of attractiveness linked to the recommendations of public authorities' to avoid public transport. Later, evidence showed that when preventive measures are in place, the risk of contamination is low and public transport is COVID-19-safe¹⁵. We also saw that if the revenue crisis is not addressed, it could seriously affect a city's capacity to move towards a more sustainable transport system in the future.

According to a UITP report “Win back passengers – Facts, figures and the new normal”¹⁶, published in November 2021 and resulting from a survey with operators and authorities, in order to address the long-term changes in mobility patterns in the post-COVID-19 era, the “new normal” must include an acceleration of the public transport sector's digitalisation, reinforced cleaning operations as well as increased and targeted communication to passengers.

¹² https://ec.europa.eu/commission/presscorner/detail/en/ip_20_854

¹³ https://www.eltis.org/sites/default/files/sump_topic-guide_planning_for_more_resilient_and_robust_urban_mobility_online_version.pdf

¹⁴ More in UITP, June 2021, Preparing for a better future: How transport authorities have managed the crisis, Knowledge Brief.

¹⁵ More in UITP, 2020, Public transport is COVID-19-safe, Policy Brief.

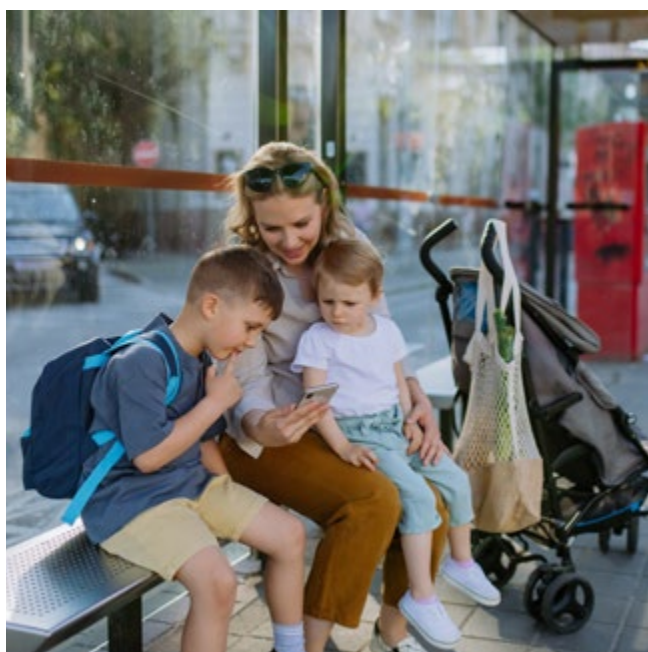
¹⁶ <https://www.uitp.org/publications/win-back-passengers-facts-figures-and-the-new-normal/>

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



1.3 Discussing public transport in the context of SUMP

Many cities in Europe have designed, implemented and often already revised their SUMPs. To support local and regional authorities with their SUMPs, the EU has developed a whole set of guidance materials (SUMP Guidelines¹⁷, Topic Guides¹⁸, Practitioner Briefings¹⁹,



etc.) and platforms for the exchange of best practice (Eltis²⁰, CIVITAS²¹, etc.). These tools are at the disposal of cities and regions and encourage the development of SUMPs with long-term visions, goals and objectives, covering the functional urban area: the entire city as well as the surrounding sub-urban and peri-urban area, which are economically and socially linked.

Public transport has long been recognised as an essential component in the planning and implementation of local and regional SUMPs and the backbone of a sustainable transport network. In this respect, public transport is reflected in all the SUMP core principles and process described in the SUMP Guidelines 2.0 (second edition of the SUMP Guidelines)²².

The SUMP core principles present the main features of a modern and sustainable urban mobility and transport plan. They comprise the following main elements, in which public transport is mainstreamed.

¹⁷ <https://www.eltis.org/mobility-plans/sump-guidelines>

¹⁸ <https://www.eltis.org/mobility-plans/topic-guides>

¹⁹ <https://www.eltis.org/mobility-plans/practitioner-briefings>

²⁰ <https://www.eltis.org/>

²¹ <https://civitas.eu/>

²² <https://www.eltis.org/mobility-plans/sump-guidelines>

Figure 2 The SUMP planning cycle. Source: Guidelines for developing and implementing a Sustainable Urban Mobility Plan, Second Edition, 2019



The SUMP Guidelines 2.0 offer concrete suggestions on how to apply the SUMP concept and prepare an urban mobility strategy that builds on a clear vision for the sustainable development of the entire urban area. This process of developing and implementing a SUMP can be broken down into 12 main steps that are also relevant for public transport planning.

In designing SUMPs and attempting to secure change in urban mobility patterns towards more sustainable modes, making public transport more attractive should be regarded as a critical challenge. The SUMP approach proposed in the recently published EU Urban Mobility Framework²³ emphasises the role of public transport as the backbone of the transport system. It provides new incentives for cities to engage in sustainable urban mobility management, with public transport at its core, in line with the EU climate goals²⁴, which puts people – not cars – at the centre of cities’ strategies.

In the years following the COVID-19-pandemic, public transport will have to evolve with a stronger focus on decarbonisation, digitalisation and the growth of its services for a diversity of users. The capacity to navigate through crises and build a more resilient system is key. All of these three areas of transformation require political support, additional investments, better knowledge of different users’ needs and their mobility patterns, and better urban mobility planning that goes beyond “business as usual” to make public transport an attractive travel option for all.

²³ https://transport.ec.europa.eu/system/files/2021-12/com_2021_811_the-new-eu-urban-mobility.pdf

²⁴ https://ec.europa.eu/clima/eu-action/climate-strategies-targets_en#:~:text=The%20EU%20aims%20to%20be,net%2Dzero%20greenhouse%20gas%20emissions

2. Planning for attractive public transport



This section covers specific areas where public transport planning can be improved, leading to more attractive public transport and thus inducing a modal shift away from the car.

2.1. Understand the quality of the current service and the needs

2.1.1 Assess your current situation

When planning for public transport, it is important to analyse the major problems and opportunities related to mobility in the entire functional urban area, by using an appropriate set of reliable and representative data sources. In urban transport, such knowledge is often very fragmented and incomplete. To conduct a good analysis, the first step is to identify what data is needed, what information is available, and what is still lacking. Cities with little data available should not be discouraged but rather see it as an opportunity to improve their data collection as part of the SUMP process.

Some of the core considerations for analysis are:

- Existing service capacity;
- Existing service frequency;

- Journey speeds and their variability, and car comparators;
- Current and future in-demand travel routes (including journeys currently taken by car).

This analysis should help to understand the current service quality, what new public transport routes are needed, or how many public transport vehicles need to operate on them at different times of day.

To support them in this exercise, cities can benefit from data gathered through modern technology and software, such as GPS and automatic fare collection systems. It is recognised that data analytics' capabilities in cities are often rather limited and the extent to which data is used to inform city processes is not easily demonstrated. However, high-performing cities are finding ways to turn this data into smart data, for instance by making the most of smartphone apps to collect data, or by providing open access to structured databases which can be accessed by external stakeholders through APIs. Similarly, cities have been promoting data usage for research purposes by establishing agreements with universities. Data sharing should not be a one-way street. Public transport operators and public transport authorities need access to relevant, disaggregated data to gain better insights into users' needs, as a basis for planning processes, policy-making, transport supply,

investment decisions, etc. Cities should complement quantitative data with nuanced qualitative data about users' public transport experience.

Therefore, it is important to consult with citizens on the public transport-related issues that they feel need to be addressed in a SUMP. This makes them aware of the planning process, ensures that their voices are heard and makes them feel a sense of ownership of the SUMP. Surveys (household, on-street, in-vehicle), on-street observations (e.g. manual traffic counts, site visits, inventory of curb space assignments), interviews or focus groups, are useful tools to gather quantitative and qualitative data.

Sustainable urban mobility indicators are a useful tool for cities to identify the strengths and weaknesses of their mobility system and focus on areas for improvement. Within the SUMI project²⁵, the European Commission and involved stakeholders have developed a comprehensive set of practical and reliable indicators that support cities to perform a standardised evaluation of their mobility system and to measure improvements that result from new mobility practices or policies. The following indicators have been developed within SUMI and are relevant for assessing the quality of services for public transport:

- Indicator 1: Affordability of public transport for the poorest group;
- Indicator 2: Accessibility of public transport for mobility-impaired groups;
- Indicator 6: Access to mobility services;
- Indicator 7: Greenhouse gas emissions;
- Indicator 11: Multimodal integration;
- Indicator 12: Satisfaction with public transport;
- Indicator 16: Commuting travel time;
- Indicator 18: Security.

SUMI also proposes a modal split indicator²⁶.

Understanding the actual financial situation of the public transport system of the city and the functional urban area is also crucial, e.g. there may be an urgent need for e-buses, yet finance to operate or procure the classic Euro6 diesel buses is lacking. SUMP should clearly describe whether financing opportunities (city-wide, regional, national, EU) are correctly allocated or whether

there are disparities that operators or authorities cannot overcome due to financial, political or other reasons.

With the information available, cities should prepare a list of challenges and opportunities that relate to public transport (e.g. accessibility to services, pollution, social inequality, road safety, climate protection, land-use patterns and resilience of the network), and identify and prioritise key problems to be addressed by their SUMP. The analysis should consider the needs of the whole community, including women and vulnerable groups such as children, people with reduced mobility, older persons, low-income households, minority groups, etc. Important questions to consider are: does the transport system guarantee equal access and is it affordable and available?

2.1.2 Understand the needs

Once cities have set a baseline against which progress can be measured, they need to analyse what the actual and predictable needs are of all groups of citizens, and together, define the strategic direction for public transport services.

It is important to analyse the likely changes in the relevant external factors for public transport (e.g. demography, information technology, climate, impact of COVID-19) and develop scenarios that explore alternative strategic directions. It is recommended that visioning exercises with users and potential users are used to develop a shared understanding of desirable futures, based on the results of the mobility analysis and scenario impacts.

Society is evolving. Quick changes in demand, as seen in the pandemic, require a capacity to capture and understand the mobility situation in order to adjust mobility assets and services. Too often routes and services remain static and do not adjust to new circumstances in and around the city. This analysis should be an ongoing process to enable the public transport network to develop alongside other changes in the city. It should be subject to continuous evaluations and revisions to update objectives and make the necessary adjustments.

²⁵ https://transport.ec.europa.eu/transport-themes/clean-transport-urban-transport/sumi_en

²⁶ https://transport.ec.europa.eu/other-pages/transport-basic-page/modal-split_en

Citizens redesign the public transport network of Vitoria-Gasteiz (Spain): 89% increase in public transport users between 2008-2018!



Source: Vitoria-Gasteiz City Council

Vitoria-Gasteiz in the Basque Country of Spain successfully made its urban transport more sustainable through mobility planning and public transportation redesign. The city joined the CIVITAS MODERN²⁷ project in 2008, with the aim to improve urban transport through stakeholder engagement and a performance-led approach.

In 2009, Vitoria-Gasteiz fully redesigned its public transport network and held a citizen information campaign to accompany it. Thanks to a shared learning process, which involved all stakeholders for more than a year and a half, Vitoria-Gasteiz recorded a significant shift towards public transport. Thousands of citizens participated in the improvement of local urban mobility; the city's bus lines were modernised to a network system (from a radial one); the first two tramway lines were implemented; and a cycling plan was developed. This led to a 14.5% increase in the service speed and fuel consumption fell.

Between 2009 and 2018, the city saw an 89% increase in public transport users, despite public transport use in the country decreasing overall. And, in a 2019 survey of the city's public transport users, 91.5% reported being satisfied with the public transport system. Improvements are continuing, with new lines being extended and a bus line being replaced with 100% electric Bus Rapid Transit.

Measures developed in MODERN, notably the redesign of the public transportation system and deployment of a "superblock" approach²⁸, were included in Vitoria-Gasteiz's SUMP.

In 2012, the city was a finalist for the prestigious title of European Green Capital, with their SUMP receiving the maximum score.

²⁷ <https://civitas.eu/projects/modern>

²⁸ https://civitas.eu/sites/default/files/modern_vg_m05.01_0.pdf

Understanding customers' current experience and needs is instrumental to improving the quality of public transport services, increasing customer satisfaction and the use of public transport. When users are involved in the design or development of a good/service, the end value is enhanced because they can customise the product according to their needs. The use of collective intelligence (crowdsourcing, co-design) and users' experience research (UX) can help detect (hidden) users' needs and improve current and future services. Not all users are the same – market segmentation can help to better understand and approach different user groups, increase customer satisfaction and attract new users.

Nowadays, the availability of data generated by many different devices and players provide lots of information to help understand what current users demand. In this context, it is important to develop a data strategy to collect, manage and make use of disaggregated data for planning purposes. This also implies developing a different mindset and capacity building.

Customers are also good at identifying infrastructure that needs to be cleaned or fixed, for instance. Creating a connection with customers by collecting data, getting their feedback and starting a dialogue with them ('feedback loops') is an avenue that needs to be explored further.

Understanding the needs of potential users is at least as important – if not more important – as understanding the needs of current users. Planning for more attractive public transport should include the systematic study of target users and their requirements, to add realistic contexts and insights to planning processes. All citizens are potential public transport users and should systematically be involved in the development of new services and the improvement of existing ones. This can be done in two steps:

- The first step consists of organising dialogues with citizens and involving them in research and innovation. Particular efforts may be needed to pro-actively reach out to specific groups such as women, children, persons with disabilities or reduced mobility, persons at risk of poverty and social exclusion, ethnic minorities etc. Citizens should be part of transport governance structures at all geographic levels.

- The next step is to actually implement the input given by users and potential users. Understanding users' needs will help match the service with demand, but this can only happen with a sufficient (political) will to act, as consultation and dialogue alone do not lead to concrete results.

2.2 Take a whole-network approach to public transport planning

A whole-network approach to public transport planning through public transport-oriented development, whereby jobs, housing, services and amenities are clustered around public transport hubs, can bring a host of benefits to urban and peri-urban mobility and its decarbonisation. This requires better integration of planning and operations to improve the connections of city centres with areas outside the city, and improved local governance.

2.2.1 Integrate public transport physical planning, fares and operations

It is recommended that a whole-city approach is taken to public transport planning through public transport-oriented urban development. Public transport stops are a logical place to concentrate urban development. Better integration of land-use and public transport planning creates sustainable, inclusive and resilient cities and has long been considered a positive means for shaping city development around walking, cycling and public transport. However, in many cities, there is still much more to be done to further strengthen the integration of these planning processes. Working with transport authorities and operators to find optimum solutions is key.

New developments should be designed around public transport – not private car access, and their locations optimised to ensure that they form part of sustainable and viable public transport corridors. Better integration of public transport and land use planning will improve the accessibility of urban areas and enable people to travel more by alternative modes, and increase the demand for public transport, particularly by encouraging mode change from the private car.

Promoting a whole network, but also an intermodal approach, means integrating physical public transport planning, fares and operations. More specifically, this integration includes:

- Physical planning and integration of modes: public transport routes, as well as walking and cycling infrastructure, should be planned to intersect each other, so that passengers can easily move from one mode to another during their journeys. This implies designing public transport lanes, intersections,

stations and stops in an integrated way, and developing multimodal hubs, making transfers easy and smooth.

- Integrated information, ticketing and fares: the integration of timetables results in convenient connections and acceptable overall travel time. The integration of information, ticketing and fares (overview of travel options, ability to buy multimodal tickets in a one-stop-shop) generally simplifies the use of public transport. Payment systems should be integrated so that passengers only have to pay once for trips that include several public transport modes, shared mobility services, parking, etc. Smart ticketing systems automatically adjust the fare that is charged. They also take into account each passenger's specific journey and travel frequency, providing a seamless experience. It is worth remembering though that not everyone can, or wants to, access digital information.

The 15-minute city

The climate crisis and COVID-19 pandemic have accelerated the consideration and implementation of the 15-minute city. The '15-minute' city concept – developed primarily to reduce carbon emissions by decreasing the use of cars and motorised commuting time – is a decentralised urban planning model, in which each local neighbourhood contains all the basic social functions for living and working. Many people argue that the concept of creating localised neighbourhoods in which residents can get everything they require within 15-minutes by walking, cycling or on public transport will ultimately improve the quality of life. Such spaces entail multi-purpose neighbourhoods instead of specific zones for working, living and entertainment, reducing the need for unnecessary travel, strengthening a sense of community, and improving sustainability and liveability²⁹.

A good, well-used public transport system that serves the whole city is a key element of the 15-minute city concept. This is made possible, for instance, by ensuring that public transport stations, interchanges and bus routes are well served and include secure bike parking and clear signage, with quality pedestrian space in the surrounding area. It implies improving the quality and density of public transport links between neighbourhoods and to poorly connected neighbourhoods.

In July 2020, the C40 Cities Climate Leadership Group published a framework³⁰ for cities to "build back better" using the 15-minute concept, referring specifically to plans implemented in Milan, Madrid, Edinburgh, and Seattle after COVID-19 outbreaks.

- Integrated operations (see also chapter 2.2.3 on enabling better governance): ideally, a single transport authority or agency should be responsible for managing all public transport systems, as well as shared mobility options, in the city and optionally, also in the functional urban area (or the area of the transport association). If this is not possible, it is recommended that the integrated service area is widened to overcome the barriers of city borders, which also means service borders in many cases. This allows for seamless intermodal integration and timetabling, smart ticketing and single apps for users to find information.

2.2.2 Better connect urban areas with peri-urban and rural areas

Public transport creates jobs, promotes territorial accessibility and social inclusion. In suburban and peri-urban areas, enhanced public transport also fosters economic development, improves social equity and addresses the climate crisis by leading to a modal shift away from the car.

Around one third of the European population lives in villages, small towns and peri-urban areas on the outskirts of cities and often depends on private cars to be able to reach urban nodes, e.g. to get to work or to school, socialise, travel or shop. However, this leads to a high number of cars entering and leaving urban nodes every day, which has negative repercussions on pollution, congestion and road safety³¹. The pandemic and the related teleworking trend have reduced the importance of city centres (empty offices) and increased the importance of peri-urban and rural areas. However, public transport is still very focused on bringing passengers to the city centre in the morning and back to the suburbs in the evening. Many public transport authorities and operators have recently realised that this is no longer the trend and have started to introduce peripheral services.

²⁹ <https://www2.deloitte.com/global/en/pages/public-sector/articles/urban-future-with-a-purpose/15-minute-city.html>

³⁰ https://www.c40knowledgehub.org/s/article/How-to-build-back-better-with-a-15-minute-city?language=en_US

³¹ https://transport.ec.europa.eu/system/files/2021-12/com_2021_811_the-new-eu-urban-mobility.pdf

In that context, the EU has highlighted the need for efficient and inclusive connectivity between rural, peri-urban and urban areas via sustainable mobility options³². It strongly recommends integrated links between rural, suburban and urban areas in the planning of the TEN-T network and connections between these areas and cities, and calls for efficient public transport interchanges with the TEN-T urban nodes and the development of multimodal passenger hubs, including park-and-ride facilities. This should help improve first and last mile connections and enhance the necessary capacities for long-distance connectivity in and between urban nodes. Obligations for SUMP are proposed for the established urban nodes under the revised TEN-T Regulation³³. At the same time, the scope of SUMP should be further complemented and improved, taking into account linkages with surrounding rural areas and anticipating the need for specific indicators and requirements on SUMP for the TEN-T urban nodes.

More specifically, to ensure better connectivity with areas beyond the city and to serve the needs of more citizens, including commuters, a whole-network approach to public transport planning should develop multimodality hubs with park-and-ride facilities, which could be used to link sparsely populated or hard-to-serve rural and peri-urban areas with urban cores, without the need for people to bring private cars into those cores.

Demand responsive transport (DRT) and shared mobility services and Mobility as a Service (MaaS) offer flexible solutions that can efficiently complement traditional public transport in low density areas. Affordability of such schemes is important if they are to be maintained as a sustainable element of the network – too often these begin as a well-intentioned experiment but as budgets are cut, the cost per trip is revealed as being unachievable. DRT, for instance, often lacks the “permanence” factor that people need so that they can rely on public transport, but it can offer valuable flexible solutions and flexibility options (zone-based services, point-to-point services, late evening and night services).

To become affordable and long-lasting, DRT, shared mobility services and MaaS need financial support in some cases. This requires all stakeholders to work together to reconcile commercial and public interests in the design and operation of these services. An integrated offer that includes single ticketing would also help to make seamless connections to longer-distance rail travel and increase the mobility options for people living in remote areas, for persons with reduced mobility and for commuters, including from rural and peri-urban areas.

The vision of Flanders, Belgium: a new transport accessibility policy to guarantee a better quality of life

Flanders is the northern part of Belgium inhabited by 6.6 million people, has a relatively high density of 484 inhabitants/km², more than 300 cities and municipalities, and a regional and a federal government. Tackling links with rural mobility in Flanders is crucial. The Department of Mobility and Public Works of the Flemish government (MOW) will soon be implementing the “Basic Accessibility” policy that “guarantees access to important social places on a demand-driven basis by different means of transportation” through a core network, additional network and first-and-last-mile solutions. To fulfil its mission, this system is expected to support the economy and society and be sustainable, safe, multimodal, integrated, and intelligent.

To get there, the first step will be to transition from “supply-driven public transport” to “demand-driven public transport”. For supply-driven public transport, the policy requires that every citizen has a bus stop within walking distance (800m). While in rural areas the frequency of services is very low, with the new approach, different forms of public transport would be provided depending on the area and its demand: buses, taxis, small buses, shared cars, shared bikes etc. The transfer between one mode and another would be seamless with mobility hubs ensuring end-to-end transport. Hierarchised public transport networks would be used as a tool to structure the connections between different levels as well as the governance of the overall system. In terms of governance, in the previous policy the government was the main decision maker while in the new policy, except the core network, 15 transport areas would be created where local communities decide together what types of transport to offer within a budget. The mobility plans would be done at the level of the 15 transport areas and would need to fit within the framework of the Mobility Plan Flanders and Policy Plan Space Flanders, while integrating passenger transport, freight transport, infrastructure and spatial planning.

For users, the new policy would offer another way of planning a trip. Before it, users would have to adapt to the bus scheme. With the new policy, they would have to plan their trip via a mobility centre, a public MaaS, that is contracted, impartial, data-driven and customer-centric, that facilitates planning and booking trips. The co-creation of this MaaS ecosystem is currently ongoing. Looking for solutions for rural mobility can drive innovations in the whole public transport system.

³² A long-term vision for the EU’s rural areas https://ec.europa.eu/info/strategy/priorities-2019-2024/new-pusheuropean-democracy/long-term-vision-rural-areas_en

³³ https://transport.ec.europa.eu/system/files/2021-12/com_2021_811_the-new-eu-urban-mobility.pdf

It is to be noted that the development of the above-mentioned new mobility services, including shared micromobility, could have unwanted effects – cities, therefore, need to safeguard their mobility goals independently. It is essential to have a political vision of ‘what kind of city we want’ (15-minute city, etc.) and to stick to the goals initially defined for urban mobility. This approach should be embedded in the desired vision for mobility in the city or region. It should integrate all transport modes, cover all mobility services and practices, including cycling, walking, shared mobility services (micromobility services, etc.), and cover the last mile where access points are far away or the frequency of public transport is low. Applying a whole-network approach to public transport planning will require an understanding of the needs of citizens living in peri-urban and rural areas.

2.2.3 Enable better governance

For an efficient whole-network approach to public transport, sound and supportive governance is needed, either through effective cooperation between the different bodies involved, a public transport authority, or a regulating agency. Its geographical boundary should ideally cover the full functional area, including peripheral areas, and coordinate with the regional authorities.

The competences required to create and implement a SUMP are typically divided among different authorities and institutions, and within them, among different departments, each one with different focuses and priorities. Cross-sectoral thinking and avoiding acting in silos (e.g. cooperation with the land use department, social services etc.) is essential. In this context, establishing a clear vision, an ambitious strategy and a well-coordinated action plan for public transport is crucial to achieving a substantial change in the mobility of a city and region towards a more efficient and sustainable service.

Governance challenges are very different from one country to another, depending on the governmental institutions in place and the level of regulations needed to manage the mobility system of a city. Generally, the following challenges can be noted:

- Lack of strategic vision with regards to urban mobility, which leads to fragmented and poorly integrated decision making and planning.
- Lack of coherence between public transport, mobility policies and urban planning: street design and management policies, land-use planning.



- Lack of coordination between traditional transport systems and new mobility services such as shared or on-demand mobility: integration of services, fares and information, regulating new mobility services which do not fall under any legal framework or authority.
- Lack of coordination between planning, transport, health and education functions.
- Lack of dialogue and/or engagement between all concerned parties, including operators, authorities, municipality, etc. to discuss competing needs and objectives.
- Low resilience and preparedness to changes such as the entry of new mobility players with new business models, new travel habits, and challenges.
- Poor access to data and a lack of disaggregation and understanding of data to better understand mobility needs and solutions.
- Poor involvement of transport users in design and planning, notably women and vulnerable groups (older persons, persons with disabilities or reduced mobility etc.).



Furthermore, the lack of empowered institutions, trust and cooperation between stakeholders (public and private bodies) creates challenges in building a mobility strategy with clear goals and tools. It becomes extremely complex to efficiently manage the mobility ecosystem. Closer cooperation with the utility sector, such as energy companies, is recommended, for instance to coordinate the introduction of e-buses. This is even more relevant nowadays in the context of the new energy crisis. Cooperation should focus on sharing objectives and orientating actions in the same direction.

Strong political will, back-up and strong governance are also needed to build the mobility vision and strategy, and to implement them. Dialogue and discussions are part of the process between regulators, service providers and users, that should be linked throughout for an effective participative process. For instance, while cities need to demonstrate agility to deal with new players and new mobility demand, they might not have the competences at their level – a competence might belong to the national government instead and might require several years and political investment to gain it. Cities will sometimes need to develop new governance and contracting frameworks, e.g. for on-demand or shared micromobility services. National legislation should support cities in this process by allowing flexible adjustments in planning and management of new mobility services.

In the medium and long term, creating institutions responsible for public transport, such as an integrated public transport authority (PTA) for the entire functional urban area, could be an efficient solution because:

- they act in the public interest and ensure a well-functioning and integrated transport system within their territory, with the overarching goal of a human-centred city and environment;
- they provide a holistic approach and vision of the mobility system based on clear responsibilities such as regulation, planning and integration.
- they ensure the funding tools for the operation of the public transport system, including maintenance and renewal;
- they ensure the delivery of transport and mobility services and work around the integration and regulation of the public transport network, promote network planning, and provide infrastructures and systems that enable operators and mobility providers to supply beneficial services to customers and society;
- they can make decisions independently, innovate and cooperate with non-transport stakeholders and work in close cooperation with land-use planning departments and developments.

It will be important for local authorities to develop flexibility and adapt to updated management structures (e.g. a new public transport authority) that are more efficient and also tackle new challenges, such as the rise of shared micromobility schemes. Integrated PTAs require, in some cases, a complete reorganisation and reallocation of competences in and around the city.

2.2.4 Decarbonise public transport

Transport represents almost a quarter of Europe's greenhouse gas emissions and is one of the main causes of air pollution in cities. The transport sector has not seen the same gradual decline in emissions as other sectors, with individual car usage in cities being one of the problems.

To overcome urban mobility challenges, cities need to encourage a modal shift in favour of more sustainable transport modes, such as public transport, walking and cycling. An integrated long-term strategy, developed and implemented through a SUMP, is key to achieving significant modal shift goals and decarbonisation efforts in cities.

A SUMP with public transport as the backbone of urban development and of a city's sustainable mobility system must be complemented and supported by efforts in other local policy areas such as land use planning, mobility management, combined mobility, and many others (environment, energy, social services, health care, etc.). Planning tools are necessary to ensure the public transport system expands in parallel with new urban development to avoid urban sprawl. These plans will have to be in line with other local and regional development policies and goals (e.g. climate goals within Sustainable Energy Action Plans – SEAPs) to ensure the same vision is put in place and pursued consistently.

A Topic Guide³⁴ details the SIMPLA project³⁵ approach, which offers a structured process and methodology to achieve the harmonisation of strategic sustainable energy, climate adaptation and mobility plans, coordinated with the main relevant local strategic documents, especially land use planning tools (see case study below). This integration would ensure a stronger commitment of cities to sustainable urban mobility with low-carbon transport, including public transport, with the goal of achieving a modal shift. This would also ensure that SUMP support an integrated approach within urban areas, but also that plans meet local and regional needs.

An urban transport system built on these principles ensures accessibility, improves safety and security, increases public transport's attractiveness and economic growth. The list of positive effects is long, and a sustainable transport system also reduces pollution, GHG emissions and energy consumption, improves the cost-efficiency of goods and passenger transportation, and enhances the quality of the urban environment.

It should be noted that public transport is already a low-carbon transport mode compared to the private car, but when coupled with efforts to decarbonise public transport fleets and operations, the full carbon benefits towards urban transport decarbonisation can be realised. This is supported by the EU, which promotes a broader shift towards zero-emission mobility, with hydrogen and in particular battery electric buses representing a fast-growing share of public transport fleets across the EU. European alternative fuels infrastructure legislation³⁶ is currently being revised as part of the Fit for 55 package³⁷. It sets a framework for completing the standardisation of recharging infrastructure at the EU level, and the revised Clean Vehicles Directive³⁸ sets national targets for public procurement of clean buses, trucks, cars and vans for services such as public transport, waste collection or

mail and parcel transport. The EU prioritises support, particularly for deploying the necessary recharging and refuelling infrastructure to allow a smooth transition towards zero-emission vehicles. The EU also set-up the Clean Bus Europe Platform³⁹ to help cities make the transition towards clean bus fleets. When decarbonising the public transport fleet, it is recommended to plan for different types of bus/coach service and their decarbonisation needs – both longer distance services and longer urban duty cycles are beyond the current capabilities of battery technology without an intermediate or opportunity charge, so these are needed in urban areas with the ability to “book” a charging slot – accommodated in the TEN-T urban nodes proposals for interchange/hub facilities. An alternative approach is hydrogen fuel cell technology, but costs would be so much higher – for vehicles, fuel supply, maintenance, and the fuel itself.

Decarbonising public transport should be viewed in the context of the “avoid-shift-improve” principle to successfully transform the transport system: avoiding unnecessary traffic and building more transit-oriented cities, shifting to the most sustainable modes of transport (i.e. public transport, walking and cycling), and improving vehicle and fuel efficiency of each mode of transport as well as optimising the operational efficiency of public transport. This includes the attractiveness of public transport. Efforts to curb the pandemic created positive impacts on emission levels and air quality in cities, which are now challenged by an increased use of private cars seen as safer than public transport. Nevertheless, a new environmental consciousness is also growing among citizens. The sustainability of transport options increasingly drives citizens' decisions when it comes to moving around cities and beyond. In this context, providing decarbonised public transport will help to meet these users' needs and possibly attract new users, while at the same time delivering on climate change and sustainable development goals.

³⁴ https://www.eltis.org/sites/default/files/harmonisation_of_energy_and_sustainable_urban_mobility_planning.pdf

³⁵ <http://www.simpla-project.eu/en/>

³⁶ Directive 2014/94/EU on the deployment of alternative fuels infrastructure

³⁷ <https://eurlex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0559>

³⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02009L0033-20190801>

³⁹ <https://cleanbusplatform.eu/>

Harmonised SUMP and SEAPs in Spain and Italy for reducing transport emissions

Setting up joint planning processes is not an easy task: energy, transport and mobility are often managed by different city departments, and joint planning in these sectors entails the participation of stakeholders and the local population, vertical integration with other governance levels and a long-term vision, trying to balance costs and benefits. To address some of these challenges, the SIMPLA project⁴⁰ developed guidelines which aim to help cities harmonise the actions of the SECAPs (Sustainable Energy and Climate Action Plan) and SUMP, and also identify co-benefits and impacts of jointly tackling energy and mobility planning, including public transport planning. Monzón and Parma are two European cities which have been harmonising their mobility and sustainable climate and energy plans:

- The city of Monzón, in Spain, developed its SUMP and SECAP in an integrated way. It set up a harmonisation team in charge of developing both plans and exploiting synergies, shared the transport emissions inventory between both plans, identified common measures, and assessed their impact on both plans and their objectives.
- The city of Parma, in Italy, also developed its SUMP and the second monitoring of Sustainable Energy Action Plan (SEAP) in an integrated way. Parma promoted the set-up of a harmonisation team in charge of developing both plans and exploiting synergies, with a common transport emissions inventory for both plans. The harmonisation activity identified common measures and assessed their impact on both plans and their objectives. In 2020, Parma approved the SECAP; through it, plans are now aligned with data and indicators to better monitor and govern sustainability strategies.

2.3 Ensure a high quality of service of your public transport system

High quality public transport services are reliable, frequent, fast, comfortable, convenient, accessible, affordable and safe, serving routes for which there is demand. To make public transport an attractive and everyday choice for residents and thereby reduce car use, cities as well as public transport providers should consider the following measures.

2.3.1 Provide good quality mobility options characterised by frequent, reliable and integrated services

The public transport experience can be improved through reliable and easy-to-use services. Passengers expect convenience and quality of services in terms of frequency and coverage, travel duration (door-to-door) and comfort (available seating, condition of the vehicles). Lack of comfort (overcrowding), (too) complicated ticketing, delays and long travel times are strong push-out factors or “dissatisfiers”.

In many cities, public transport systems lack efficiency, have hard-to-read route maps, unbalanced coverage in the city and differing operating hours. Their potential can be better exploited by redesigning the networks and improving service standards as follows:

- In line with the demand, optimising routes and ensuring coverage across the city;
- Building regular stops for safe and easy access;
- Designing an accessible public transport network and easy-to-read maps;
- Providing reliable and high-frequency services, e.g. for buses by splitting the bus network into main routes and local routes, with different frequencies for each.

Good connections throughout the mobility network are important to passengers. Especially in less densely populated areas, where the frequency is low, good connections with additional public transport and/or first and last mile solutions are essential (see chapter 2.2.2).

Digital multimodal solutions and automation of tram, bus, urban rail and metro services can increase the frequency of services, which consequently can also cut operating costs. Digital multimodal solutions (addressed more in detail in chapter 2.3.6, including new requirements on multimodal digital mobility services and mandatory provision of operators’ real-time data) are paramount to increasing the attractiveness of public transport, such as Mobility as a Service (MaaS) apps, which should be structured around the public transport system. It is important to note that this only works when services are already available, i.e. the offer must be there first.

⁴⁰ <http://www.simpla-project.eu/en/>

Piano recitals at Amsterdam (Netherlands) Grand Centraal Station

The area around Centraal Station is in the heart of Amsterdam. Not only trains, but buses, trams and ferries all leave from this area. The building itself is an architectural masterpiece and the Dutch have made great efforts to make it tourist friendly with information desks and volunteers to answer questions. The feature loved most in the station is the grand piano with a sign saying, “Play me”. Many talented pianists play for the enjoyment of the crowds, and this changes the travel experience.



Source: ANP

Travel time, as well as waiting time perception, are also important. For example, Wi-Fi on board allows a more productive and purposeful use of travel time. Similarly, access to shops and other utilities or entertainment in stations make the waiting time more convenient, enjoyable and relaxing e.g. pianos at train stations. Therefore, spaces and services around public transport stations are key.

2.3.2 Ensure accessible and inclusive public transport

Successful public transport serves commuters and travellers, high- and low-income households, older and young people, women and men alike. It is important to adapt urban public transport infrastructure and services to ensure better accessibility to persons with disabilities and reduced mobility.

Some key aspects to consider when speaking about ‘accessibility’ include, for instance:

- Accessibility of stations and stops;
- Accessibility of rolling stock;
- Accessibility of the public space;
- Accessibility of information e.g. announcements, journey planners.

Planning for more attractive public transport goes hand in hand with enhancing the accessibility for everyone, especially persons with disabilities and reduced mobility. It is estimated that 80 million persons in the EU have some form of disability⁴¹. Moreover, that figure increases to 35-40% of the population when travellers accompanying

Persons with Reduced Mobility (PRMs) and people with temporary mobility restraints (such as parents with prams or heavy luggage) are also considered⁴².

The findings of a survey by the Trips project⁴³, addressed at persons with different disabilities suggest that an interactive, real-time, accessible journey planner would motivate users to travel and make their journey more independent, faster, easier, nicer, and safer. Some of the preliminary recommendations imply greater collaboration with stakeholders to design accessible routes to access public transport. Implementing different information tools that are adapted to people with disabilities (e.g. visual aid systems, voice announcements) and ensuring the physical accessibility and safety of waiting facilities and vehicles (e.g. for prams, pushchairs, wheelchairs, walking frames) are also key planning aspects to take into account. Collaboration with stakeholders should target the design of transport infrastructures, e.g. work with easily eliminated obstacles in the infrastructure (low entrance for vehicles).

Public transport accessibility should focus on vulnerable groups in a wider sense. The availability of transport options is crucial for accessing employment and basic services related to everyday life, as well as maintaining social ties. Alternatively, the lack of transport access can feed a vicious cycle of social exclusion and economic

⁴¹ <http://www.inclusion-europe.eu/european-commission-presents-strategy-for-the-rights-of-persons-with-disabilities-2021-2030/>

⁴² https://www.eltis.org/sites/default/files/sump_topic-guide_gender-equity_vulnerable-groups_final.pdf

⁴³ <https://trips-project.eu/>



deprivation, especially for vulnerable groups. In addition to persons with reduced mobility, vulnerable groups are defined as follows by the HiReach project⁴⁴, a Research and Innovation Action (RIA) funded under Horizon 2020 which focuses on improving accessibility for:

- Women
- Children and young people;
- Older people;
- Migrants and ethnic minorities;
- Low income and unemployed people;
- People living in rural and deprived areas;
- Persons with no or little IT skills and persons with no access to internet.

Easy access to public transport information is crucial – while at the same time not forgetting those who cannot or choose not to use digital solutions. It is important to provide accessible information to make websites, mobile apps, electronic ticketing services, real-time travel information services, ticketing and check-in machines compliant with EU-wide accessibility requirements⁴⁵. As part of the TEN-T, urban nodes are now required to make it possible for passengers to access information, book and pay for their journeys, and retrieve their tickets through multimodal digital mobility services, allowing public transport to be the backbone of collective mobility in urban nodes by 2030.

In addition to the above-mentioned services, Universal Design (Design for All) for public transport infrastructure benefits all users and should be included in the curricula for engineers, transport professionals, architects and public authorities, to make them more aware of diverse needs to avoid having to make (expensive, difficult, time-consuming) adjustments afterwards.

To make public transport more appealing, it is also important to modernise the infrastructure, especially at intermodal interchanges, and make the entire voyage by public transport more comfortable. This can be achieved by:

- Installing high quality waiting facilities (seats, shelters, convenience services);
- Building secure bicycle stands, park and ride facilities, car sharing facilities;
- Improving access to stations and making it safer (e.g. pedestrian and bicycle paths, signs, redesign of surrounding space);
- Modernising rolling stock, e.g. by procuring new or renewing existing fleets, adjusting it to the requirements of potential customers by enhancing accessibility and taking into consideration what kind of service can be provided in the vehicle itself, as well as improving driver training for smooth and energy efficient driving.

Too often the quality of public space surrounding the station/stop is not included in public transport planning. It is important to develop a safe and attractive walking and cycling infrastructure close to public transport stations: for instance, most public transport investments only go out to 100 meters and it is often not enough for true added value for walkability. The other aspect is to prioritise (not just develop) these modes at the station so that users can continue their journey by walking or cycling, and those with a disability are given direct, safe and comfortable access.

The SUMP should also define minimum or fair accessibility levels that cater to people’s social needs (e.g. visiting friends, having hobbies), beyond what are considered ‘basic requirements’ (going to work, school, care related activities).

⁴⁴<https://hireach-project.eu/>

⁴⁵<https://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=celex%3A32019L0882>

To support public transport planning for better, more inclusive cities, it is important to identify, understand, and redress gender-based inequities. Gender equity is an essential dimension of sustainable transport. The purpose of gender planning is to ensure gender-sensitive policy outcomes through a systematic and inclusive process leading to equity of access to an essential service. Gender planning requires the consultation and participation of different stakeholders, leading to gender mainstreaming in all aspects of public transport planning (including legislation, policies or programmes).

Women use public transport more often than men as they often have less access to a car. In France, two-thirds of public transport users are women⁴⁶. During the lockdowns established by many countries to fight the COVID-19 pandemic in 2020 and 2021, most of the workers defined as “essential” and therefore allowed to go to work, especially in the health, retail and education sector, often in low-paid positions, were women. Research shows that safety, access, reliability, convenience and comfort, are the most important aspects that women consider when using public transport. However, much more is needed to ensure their “essential” needs are fully taken into account, starting with adequate public transport planning.

Women also use public transport differently to men. Instead of point-to-point travel (e.g. home-work-home), women tend to make shorter and more frequent journeys (trip-chaining), linked to their mobility of care. Gender should therefore be mainstreamed in SUMP, including mobility of care, as women still bear the major share of care responsibilities. Many cities already implement several innovative solutions using data from mobility of care like step-free access to trains, subways and buses to accommodate baby carriages, luggage and wheelchairs and level access platforms to trains.

2.3.3 Provide affordable services

Today, transport is the second largest expenditure item for households in the EU (housing comes first)⁴⁷. This can be a heavy burden for lower income groups, which tend to live in areas where it is cheaper to rent, and where less adequate transport options are available. In more rural or deprived areas where the public transport offer may be less frequent, people may have longer travel times to reach their employment place or other services. For that reason, equity-based strategies to deploy suitable services should be based on the quality of the transport coverage, rather than on price.

Price is an important aspect that plays a role in people’s mobility decisions, but it is not the most important

aspect, with comfort and speed being more important⁴⁸. Car ownership can be over 16 times more expensive than an annual seasonal public transport pass⁴⁹. In many cases the lack of quality or customer-centric services is the main barrier preventing a shift towards a more sustainable mobility behaviour.

Fare affordability in public transport is generally perceived as a status-based policy, which would be allocated to particular segments of the population for either marketing or customer building strategies, or to promote social inclusion. The segments of society that would generally benefit from social fares or concessionary fares, are:

- Children under a specific age;
- Students and/or Youth (e.g. under 25);
- Older people;
- Persons with disabilities/reduced mobility;
- Unemployed people.

Such types of fares would fall within the municipal transport budget or in some cases, in the municipal social budget. Resources tend to be allocated by the municipality or a compensation agreed with the operator based on either a fixed, budgeted or formula-based mechanism. As a means to further ensure equity and social cohesion within generations and social cohorts, certain French cities have implemented a solidarity pricing approach. These income-based social fares aim to provide a more efficient and equitable approach by linking household incomes to a more calibrated range of transport pricing passes. For example, the city of Grenoble noted that through this approach, a more inter-generational policy was enabled as young workers and new families were economically worse off than some pensioners or older people.

To attract ‘choice users’, public transport needs to be not only affordable, but also price competitive – as compared to the cost of owning and using a private car. The price of private transport should reflect its real cost in terms of

⁴⁶ <https://transportpolicymatters.org/2020/02/06/gender-is-one-of-the-most-robust-determinants-of-transport-choice/>

⁴⁷ <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20200108-1>

⁴⁸ <https://europa.eu/eurobarometer/surveys/detail/2226>

⁴⁹ UITP (2020) Full Free Fares in Public Transport: Objectives and Alternatives, Policy Brief

its environmental impact, effect on congestion, effect on people's health, etc. This would allow an increase in the scope of stakeholders that contribute to the investment in a quality public transport network, including as funding contributors – passengers, relevant competent bodies, employers, businesses, private car users and landowners. Taxation and subsidies are policy tools that can make sustainable modes (and multimodal travel) more attractive (rewarding people who use their bikes or public transport to go to work, applying reduced VAT rates to public transport).

It is also recommended to promote the “educate, inform, incentivise” concept of using technology to provide people with information on the true internal and external costs of modal choices for specific journeys: firstly introducing them to the concept of total cost of car use, including insurance, maintenance, depreciation etc. and the external costs of car use vs using public transport – carbon, air pollution, contribution to congestion, and giving them data on these; then nudging them towards the right choice through incentives such as mobility credits⁵⁰, tax refunds etc. This could for instance be a feature of MaaS.

2.3.4 Reallocate road space

Making the environment more public transport-friendly and less car-centric is an efficient planning strategy that should be mainstreamed to increase the attractiveness of public transport and other sustainable modes, such as walking and cycling. There are different ways to give priority to public transport through urban mobility planning. For example, reallocating road space to high quality public transport (and active mobility) is one. This is the focus of the MORE project⁵¹, which delivers tools to assist cities in their road-space design process. It develops design concepts that encourage street activity and reduces traffic dominance by considering the needs of all road users.

COVID-19 created an opportunity to remodel urban space and review the amount of road space that has been disproportionately allocated to private cars in previous decades. Public transport can benefit from this reallocation by increasing the amount of road infrastructure dedicated to segregated priority lanes for public transport, e.g. bus lanes and/or BRT. This would enhance both the reliability and overall quality of services, as well as enable more efficient operations, which reduces costs and facilitates investments (for instance in decarbonisation). Road space reallocation should also consider active and shared mobility infrastructure in the equation: dedicated public transport infrastructure should be designed in connection with

infrastructure for cycling, walking and shared mobility services to optimise a modal shift towards more sustainable modes of transport.

In addition, traffic management should prioritise public transport: in high density corridors, at traffic lights, at crossroads, give priority right-of-way, e.g. bus lanes to improve speed, reliability and on-time performance, etc. These features can be part of a BRT project, for instance, and will be increasingly relevant with the deployment of Cooperative Intelligent Transport Systems (C-ITS) and the deployment of various types of autonomous vehicles. Generally, public transport, but also cyclists and pedestrians should be prioritised in traffic management systems. Care is required to design priority measures to avoid creating conflict between pedestrians, cyclists, and public transport (in any combination) and instead maximising the opportunities for multimodal journeys between active travel and public transport. Poorly designed priority measures can bring bicycles and buses into conflict with adverse effects on both modes. Consultation with both sets of stakeholders is essential to prevent this from happening.

Action is also needed to specifically curb the attractiveness of the private car: parking strategies, including pricing or duration of stay can all help as can road pricing and congestion charging – but a high-quality public transport system must be in place at the same time in order to maximise the economic, social and environmental benefits.

2.3.5 Make more use of new technologies

Cities and transport operators should make more and better use of new technologies and innovations to make public transport services more attractive and easier to use, thus supporting a behavioural change for travellers. New technologies improve data collection, user perception of the service and reduce operational costs. More data on the actual traffic flows of people are needed to dynamically adapt public transport planning at city level and beyond, capacity, routes and timetables – rather than continuing historically established fixed transport offers.

Apps produce geo-referenced data that can be used by the city to understand the demand and prioritise planning and interventions, with the aim to improve public

⁵⁰ <https://www.itsinternational.com/its1/feature/urban-mobility-and-demand-management-mobility-credits-model>

⁵¹ <https://www.roadspace.eu/>

Counterflow bus lane in Gdynia (Poland)



Source: City of Gdynia

Polish cities are introducing solutions that aim to increase the attractiveness of public transport. One example is a counterflow bus lane on one of Gdynia's main arteries. This was an innovative solution for Poland and was launched at the end of 2019 on a route from the developing western districts of Gdynia to the city centre. It was identified as being critical in terms of tackling congestion. Before its introduction, public transport vehicles faced delays of 6-10 minutes on average during the morning peak hours. During that time, traffic volumes of 800-1100 vehicles per hour were recorded towards the city centre.

To evaluate the impact of the new variable directional traffic organisation on traffic conditions, traffic simulation studies were conducted under the conditions of the changed traffic organisation. Due to the lack of intersections and bus stops along the contraflow section, the design of the traffic organisation did not consider the challenges of adapting the elements of the street network where there were many collision points. Due to

the above, a contraflow lane was not placed directly at the location of the bus stops at the beginning and end of the section. However, thanks to the intersection with traffic signals and a bus queue jump for public transport vehicles located immediately before the start of the contraflow, the bus can enter the dedicated lane without collisions.

The technical design was carried out based on the guidelines of the Roads and Greenery Authority of Gdynia, which assumed the necessity of attaching the contraflow to the TRISTAR system operating in Tricity. Currently used devices and software for traffic management make it possible to collect and process traffic data in real time. With the help of modern, intelligent traffic control systems, it is possible to quickly and dynamically open and close lanes or entire roads, and even change traffic directions based on historical statistics or current data, so that road capacity can be dynamically changed depending on demand.

transport services and public spaces. Cities can team up with the private sector to develop these services. The Citymapper app⁵² for instance, uses mobile and open transport data to help citizens and visitors navigate public transport systems. The app operates in over 100 cities, mainly in Europe and North America, while their customisable software has global coverage. Google Maps is also adding transport crowd predictions covering 10,000 transport systems in 100 countries.

Technologies and innovations can provide travellers with real-time information on multiple transport modes, which allows them to plan journeys in advance rather than hope for the best when they set off. During the COVID-19 pandemic, some transport operators issued apps to inform passengers whether an approaching bus or train had space based on the recommended metres of social distancing. These kinds of tools can also help users outside of a pandemic to avoid busy buses and train carriages. They can also allow women to rate their perception of personal safety on public transport, which can also be used to tackle the issue of sexual harassment on the public transport system.

Public transport data sharing enables cities to improve their mobility planning, with citizens as the ultimate beneficiaries. The shift to 'data as an opportunity' mindset will require stakeholders, both public and private, to focus on creating value to end users and align their own objectives to this. Despite many uncertainties (e.g. privacy concerns, liability risks, ambiguity of data ownership and risk of losing competitive advantage), different stakeholders and sectors will need to collaborate to

provide strong, consistent and sustainable mobility services to citizens. To build a more attractive public transport system, all local mobility stakeholders, including local start-ups, will need to think outside the box and tailor initiatives to local needs. Many cities have set up structures dedicated to urban innovation, such as innovation labs and other stakeholder platforms that work together towards a common vision, including sustainable transport. Cities who do not have the internal capacity to enable innovation have established partnerships or collaboration agreements with universities and industry.

Access to data – on timetables, but also fares – is essential to create multimodal integrated information, ticketing, and payment systems. It allows service providers – this can be transport operators, or third parties – to assemble travel (MaaS) packages combining different modes, which enable door-to-door travel and allow passengers to book and pay for all legs of their multimodal trip in a one-stop shop. If public transport companies cooperate with third party platforms to sell their tickets, it must be ensured that this happens in a fair and cost-efficient way and does not lead to price increases for the user, or taxpayer. Data reciprocity is important, and customer and booking data should remain with the transport operator and be shared with the transport authority for mobility management purposes.

At the local level, most transport operators are already using new technologies to offer multimodal digital mobility services for purchasing and retrieving tickets alongside 'traditional' methods. As part of the revised TEN-T Regulation, urban nodes are required to make it possible for passengers to access information, book and pay for their journeys, and retrieve their tickets through multimodal digital mobility services, to allow public transport to be the backbone of collective mobility in urban nodes by 2030. The EU is also considering the mandatory provision of operators' real-time data (e.g. timetable and disruption information), including from public transport, through national (data) access points, in its review of Delegated Regulation 2017/1926 on multimodal travel information services to be adopted in early 2023. Transport operators will therefore need to adapt and enhance their services. Stronger cooperation at international level for long-distance travel should be encouraged, as it would have a positive impact on public transport and could further induce a modal shift. If passengers are not aware of the available travel options (allowing them to make informed choices), and if they have no easy way to book their tickets (in a one-stop-shop), this will remain a big barrier to multimodal travel (all distances).



⁵²<https://citymapper.com/brussels?lang=en>



At the same time, it is essential to be aware of the digital gap and make sure that there are non-digital solutions for people who lack the digital skills or access to digital tools, as not everyone has access to – or can use – a smartphone, cashless cards, etc. It is the inclusiveness of public transport that helps provide social benefits across local communities.

New technologies can also enhance the energy efficiency of public transport vehicles, lower the carbon intensity of fuels and increase operational efficiency. New technologies, coupled with efficient planning policies, can stimulate major investments in material extraction and recycling, battery manufacturing, the deployment of reinforced and smart electricity grids and charging infrastructure, with a positive impact on economic development. Making charging infrastructure available for other types of users such as shared cars, shared bikes, and other electric vehicles, including freight, can optimise the benefits of the uptake of e-mobility for cities. This could be much more cost-effective than standalone infrastructures, but it should not endanger the public transport service provision.

Privacy and data security should also be carefully addressed: a personalised transport offer can be great, but users must remain in full control over how and for what purposes their data are being used. Processing of personal information needs to be done in a GDPR-compliant way.

It is also important to address the challenges of digitalisation, but also automation, for public transport,

including its workers. For example, there is a high risk that the role of drivers will be automated. Solutions include reskilling and upskilling, in dialogue with social partners. The European Pact for Skills⁵³ should help in this regard and act as an incentive for stakeholders to take action.

2.3.6 Provide safe and secure services

Successful SUMP should continue to improve the safety and security of public transport: for most users, particularly women, these are a precondition to travel by public transport. Whereas public transport is amongst the safest modes of travel, improving the safety and security at public transport stations, stops, and on the vehicles, for passengers and drivers, as well as for infrastructural equipment, are key factors for more attractive public transport. Feeling unsafe can be triggered by dramatic incidents (e.g. terrorist attacks, collisions), in addition to the COVID-19 pandemic.

Most feelings around safety and security are, however, due to the anti-social behaviour of other people on public transport, inadequate or deteriorated infrastructure and rolling-stock, insufficient lighting at stops and stations (exits), and potentially in vehicles, as well as the lack of available staff, including security staff. These issues can be tackled by implementing a security strategy that addresses the most important issues identified at local level.

⁵³ <https://ec.europa.eu/social/main.jsp?catId=1517&langId=en>

Regiomove: mobility on-demand



Source: Karlsruhe Transport Operator

The project Regiomove⁵⁴, funded by the European Commission and the state of Baden-Württemberg, Germany, intends on the one hand, to provide information, booking and payment for various mobility services (e.g. public transport, car and bike sharing) from a single source, and on the other hand, to expand the various existing mobility offers at hubs, the so-called “ports”. These measures are designed to facilitate easy access and/or transfer between different modes of transport and thus provide a worthwhile alternative to private cars.

Regiomove connects regional providers of public and individual mobility digitally on one platform. This includes classic public transport, buses and trams, as well as individual offers, e.g. car sharing or rental bikes, which are particularly flexible. The service providers gain new users through user groups. The operation of the mobility platform by municipal institutions without private-sector participation safeguards public interests and thus creates the basis for being able to continue to organise

mobility in the region as part of the municipal provision of public services. The contractual framework allows all participants to participate in partnership, but at the same time, remain independent.

The digital networking in the app is complemented by a real network of mobility stations (or ports). They make it easier for the user to switch between the different means of transport. The ports anchor multimodal mobility and local offers in people’s awareness. Thanks to a modular system, all the ports are specifically adapted to the individual needs of each location and are displayed throughout the region in a uniform way to draw attention to the offer. In addition to the mobility offers, other services such as lockers or bicycle boxes can easily be connected to the ports.

The open platform architecture makes it possible to easily integrate further mobility providers and Regiomove is also easily scalable and transferable to other regions.

⁵⁴ <https://www.regiomove.de/>

Not only technological measures, but also ‘soft’ factors contribute to (perceived) safety and security. Safety and security training, as well as safety-awareness for drivers and passengers, are also solutions worth exploring.

Safety and security measures should be transparent, proportionate, adequate and effective, adapted to the different user groups’ needs, and avoid causing inconvenience to passengers. A large proportion of passenger casualties and weighted injuries are from trips, slips and falls, therefore, SUMP’s should emphasise accessible and safe public transport infrastructure.

The pandemic has also led to new safety requirements. Cleaning and disinfecting practices evolved with the COVID-19 crisis as public transport providers acted quickly to increase protective measures and reduce the risk of COVID-19 spreading on their networks. This has had a big impact on operations, and therefore on staff, but also on costs for the operators and authorities.

Cybersecurity should also be considered. With the growing digitalisation trend, public transport services and infrastructures face new vulnerabilities and a growing need for cybersecurity measures, means and capabilities.

Figure 3: Practical public transport measures and related performance indicators

Consider the different aspects for practical measures related to performance indicators						
	Practical measures	Operational aspects	Urban environment	Community involvement	Policy/legal aspects	Capacity building
Comfort	Improve waiting environment	✓	✓	✓	-	-
	Maintain shelters with AC and ventilation	✓	-	-	-	-
	Clean public toilets	✓	-	-	-	-
Easy-to-use	Services between stops	✓	✓	✓	✓	-
	Control camera, panic buttons	✓	-	-	✓	-
	Women-only services	✓	✓	✓	✓	-
	Process for harassment reports	-	✓	✓	✓	✓
Safety and security	Better lights and pavements	-	✓	✓	-	-
	Trained and professional staff	✓	-	-	-	✓
	Enforce rules and regulations	-	✓	✓	✓	✓

Source: UITP 2021, Better Mobility Playbook



2.4 Make your public transport more sustainable and appealing

The outbreak of COVID-19 has affected the public transport sector in different ways, impacting local public transport authorities, operators, subcontractors, new mobility providers, the construction industry, the IT industry and the supply industry alike. To make public transport more appealing and sustainable, cities and transport operators will need to plan for more resilient public transport, find ways to finance it, and try and break down cultural barriers.

2.4.1 Make your public transport system more resilient

During the pandemic, the importance of public transport services became evident. Despite significant drops in passenger numbers during lockdowns, public transport systems continued to operate, which allowed essential workers (such as medical staff, shop assistants, etc.) to get to their place of work. The public transport industry experienced reduced demand: only essential travel was allowed, a lot more people worked from home, and digital communication replaced physical meetings and contacts. In most networks, to ensure safe distancing and a good service for essential workers, public transport companies maintained an almost normal level of service, even during lockdowns.

The pandemic also had an impact on modal choices, with a decrease in public transport use and shared mobility, and an increase in the use of private cars, walking and cycling. Transport demand has since risen, and public transport services will need to increase to meet this demand.

For this to happen, it is important to regain the public's trust and get people back into the habit of using public transport. The time is now for positive messages to reinforce the return to activities post-COVID-19 and to reiterate that public transport is not only safe but is key to a sustainable urban future.

In the short term, the following measures can contribute to increasing passenger trust:

- National communications to support public transport and highlight its track-record as being a safe place with little probability of catching COVID-19.
- Measures to ensure hygiene and minimise the risk of infection: frequent and thorough cleaning and disinfection, ventilation, using virus-resistant materials.
- Social distancing and avoiding physical contact: optimisation of passenger flows in stations and trains, passenger counting systems, informing passengers about occupancy rates, more personal space per passenger, touchless technology e.g. for validating tickets, etc.
- Increasing the offer, promoting off-peak travel, adapting rolling stock and infrastructure to avoid overcrowding.

- Clear and easy-to-understand communication – particularly around measures taken to ensure safety – contributes to reducing stress and anxiety.
- Legal protection and compliance with passenger rights: refunds in case of cancellation and long delays, free-of-charge rebooking or rerouting, extended validity of season tickets, etc.

In the longer term, some of changes that the pandemic triggered could have a lasting effect on our mobility patterns: more working from home, less business trips, more online shopping, etc. With the likely decline in peak-hour commuting and business travel, transport operators may need to offer more bespoke travel experiences, better tailored to meeting individual users' needs, rather than mass transport. For example, passengers would like more flexible fares to match their current less-frequent commutes, that often do not justify a monthly subscription.

When it comes to commuting, but also more generally, public transport resilience requires the ability to run public transport networks efficiently, protected from the adverse effects of external developments, such as new pandemics, climate change, energy shortages, disruptions, changes in financial sources, or traffic congestion. Having to use additional vehicles and drivers to deliver the service makes this business case much harder. But the spin off benefit is that services will become quicker and more punctual and thereby provide a more attractive opportunity for today's car user to change their travel habits.

The COVID-19 pandemic is an example of a crisis that can be defined as "any event that may lead to an unstable and dangerous situation which affects the urban mobility system"⁵⁵. Another crisis of our time is the climate crisis, which also requires swift crisis management actions. Recovery after the pandemic should be used to accelerate the transition towards sustainability and resilience and readjust objectives and Key Performance Indicators (KPIs) for actions.

An approach to SUMP through a resilience lens requires assessing and acting on the risks and vulnerabilities, but also on the opportunities of the mobility system with a wide perspective, to cover vulnerable user groups, services and infrastructures. For example, this should be applied to the current electrification trend in public transport, to look at the availability and reliability of buses, depots, power supply, green-source energy, etc. In addition to sustainability and economic arguments, the green-energy transition can help reduce external energy dependency and offer value for local economies.

The recent fuel crisis has led to disturbances in the fuel supply chain and generated many cascading issues. Energy transition towards a set of different renewable sources is a way to reduce these interdependencies on one energy source. It can also be a way to empower local and circular economies to take advantage of the local socio-economic situation.

Mitigation measures, e.g. CO₂ emissions' reduction, as well as adaptation to climate change, e.g. infrastructure adaptation to extreme events such as floods or heat, as well as new designs of bus stops that provide more shade and seats during heat waves, should be considered in SUMPs together with other strategic plans.

Resilience also means safeguarding reliability and punctuality, e.g. through minimising wear and tear, preventive maintenance and addressing capacity pinch-points.

Generally, cities and public transport companies should learn from the past and develop long-term resilience. They should take advantage of the COVID-19 crisis and move towards a different type of resilience that will ultimately contribute to reducing their public transport costs. They will also need to become more agile and learn how to better anticipate events like pandemics, e.g. by designing more contingency plans.

While preparing for the unexpected, a resilient public transport system should focus on the benefits and value for society, the economy, and the transport system. It should meet people's needs in a post-COVID-19 era, which involves a new way of life and new travel behaviours, and lead to possibly new or different services or a combination of services. It will need to look far beyond the COVID-19 crisis and to think further ahead.

2.4.2 Ensure the financing of your public transport system

The public transport sector is facing a funding challenge due to its vulnerability in social and economic crises. It needs to decarbonise its fleet, digitalise its operations and customer interfaces, and increase capacity to transport more passengers, all of which require additional investments.

⁵⁵ Topic Guide SUMP Planning for more resilient and robust urban mobility: https://www.eltis.org/sites/default/files/sump_topic-guide_planning_for_more_resilient_and_robust_urban_mobility_online_version.pdf

Lille (France) – A city running on natural gas and bio-methane



Source: CNH Industry

A bus fleet that runs on... waste. Lille, in northern France, prides itself on having the largest fleet of natural-gas buses in Europe. More specifically, biomethane that comes from household waste. Iveco Bus and the transport operator Keolis are the main actors in the project. The project began nearly 25 years ago when the city began to explore ways of improving air quality and to experiment with alternative fuels.

From vision to implementation, the city of Lille is now firmly established at the forefront of large-scale sustainable mobility projects and is going a step further in its quest for an efficient and environmentally friendly public transport system, by turning waste into energy.

Every day, household waste is collected, delivered to the biogas plant, and converted into biomethane to fuel the city's buses. The creation of this virtuous cycle simultaneously provides solutions for efficient waste management, air quality improvements and sustainable mobility. The biogas plant is strategically situated alongside the bus depot.

Prior to the COVID-19 pandemic, the public transport sector was growing in many countries. However, since early 2020, it has become one of the hardest hit sectors due to its loss of passengers and increasing operational costs. The coverage ratio, depending on the region, used to vary between 30-50% in countries with a high level of support from public authorities. In less mature markets, with lower governmental support, there is a higher reliance on fares. The impacts of COVID-19 have had bigger repercussions on networks that rely largely on fare revenues. Networks with a high coverage ratio or no support from authorities, were among the worst affected by the pandemic due to their reliance on fare revenues. One of the main consequences of the pandemic was that public transport operators addressed their revenue shortage by using cash reserves or increasing debt, until cities and Member States started to implement support packages. By the end of the first lockdown, the cash reserves of many operators had been obliterated and debt ceilings passed.

The main financing options for public transport are listed below. Each of these instruments has advantages and disadvantages, and their feasibility will vary depending on the project type and local political and financial context:

- **Public finance:** cities will usually require a combination of national, state, and local funding sources to build public transport infrastructure, for example municipal bonds or loans. Loans and grants help to mobilise investment capital and improve the bankability of large-scale projects.
- **Public subsidy:** this is commonly necessary to cover operational costs. The notion that a successful public transport system fully pays for itself through passenger fare revenues is not demonstrated. As it delivers vast external economic benefits, including improved health outcomes and reduced congestion, the fare and subsidy level is a political decision. To set the fare, transit agencies should consider factors including local wage distributions, social equity and the negative externalities relating to private vehicle use.
- **Raised revenue:** for example, from fares, road pricing, transport taxes, parking fees, land-value capture, and other transport-related policies. Fare adjustment policies should also be included to ensure that rising costs and inflation are considered. The most common approach is CPI+1%⁵⁶. However, most decisions on fares tend to be intrinsically linked to the local authority

⁵⁶ <https://www.oecd.org/sdd/prices-ppp/2424597.pdf>

and are highly dependent on local politics. The evolution of fares highlights a preference for ease and simplicity for passengers, particularly in terms of enlarged zones and flat-rate fares. The evolution of demand is towards less regular commutes and has recently caused some authorities to launch new types of tickets. In addition, where possible, car use should be made more expensive, in a selective way, for those who can afford it and have public transport alternatives. It is also recommended to use revenues collected from car use, e.g. from parking fees, road pricing and congestion charging, to promote more sustainable modes of transport, including public transport. Workplace parking tariffs can be used for the same purpose. Commercial revenues are another source of revenue. They vary from 5-40% of revenues, such as from advertising, retail, development of digital services and naming rights of stations.

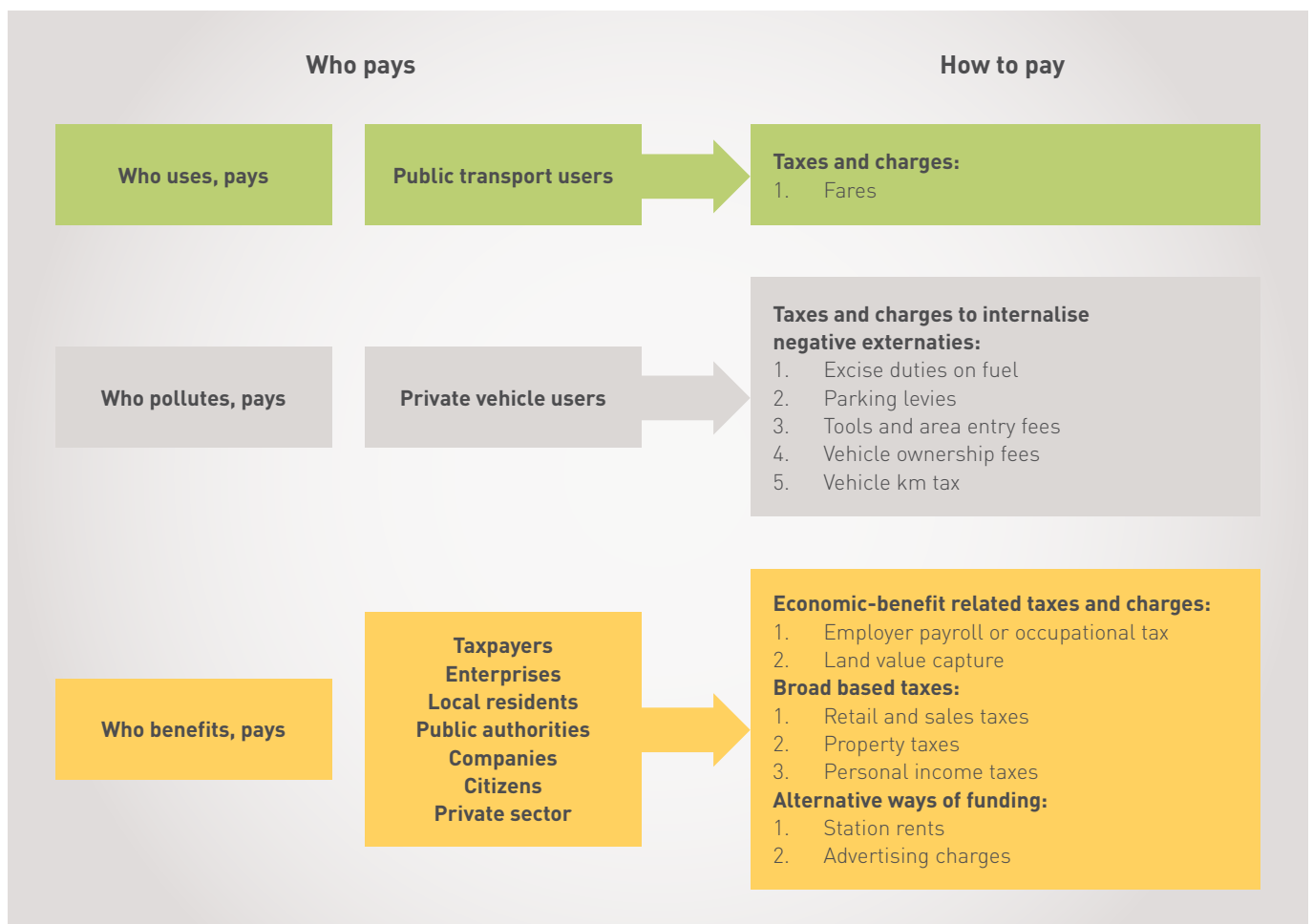
- Private investment: this includes public-private partnerships and bonds.

- Development banks: cities may be able to obtain financing support from banks such as the European Investment Bank (EIB) and the European Bank for Regional Development (EBRD) for investing in public transport.

Sometimes, developing a new revenue stream requires organisational or institutional adjustments, for example to gain a new competence, as it was the case of French local authorities with parking management.

As a result of the pandemic, the sector realised it needed to secure long-term funding. It is essential to secure a diversified funding model, especially considering the lower demand and changed mobility habits since the COVID-19 pandemic, to incorporate changing lifestyles and mobility patterns within a competitive transport market. The main tools available to ensure a dependable income stream can be shown as follows (see figure 4 below). The table below identifies users, beneficiaries, and polluters, along with the range of available tools that may help to contribute to the transport budget.

Figure 4: Income stream model



Source: UITP



Public funds are generally not sufficient to meet infrastructure investment needs. Private investors can help meet those needs, bearing in mind that this may come with potential extra costs, for example in the case of the collection and processing of data. Financial Guarantees⁵⁷, which are a promise an entity makes to guarantee the payment of a debt obligation of another party, are an important way public investment can be supported and private investment raised.

The EU has also been supporting the public transport sector with, for instance the InvestEU programme⁵⁸, which provides long-term funding to companies and supports EU sustainable recovery policies. This programme is part of the recently launched NextGenerationEU⁵⁹ – a European recovery plan to make Europe healthier, greener, and more digital following the pandemic. It provides additional resources for a variety of measures and reforms, also covering public transport, to push for more sustainable mobility. Some of this EU funding has been made available to those who are able to demonstrate the success of SUMP through measurable parameters – increasing the modal share for public transport, for instance. Other examples of EU financing include EU grant programmes such as the Africa Investment Facility (AFIF)⁶⁰. The EU also proposes advisory services for energy efficiency and renewable energy investments targeting innovative urban transport (and buildings) via ELENA (European Local ENergy Assistance).

New business models are needed that strike a balance between the interests of passengers (related to service and price; good value for money), transport operators (covering operating and investment costs, while making a margin to re-invest into improved services) and authorities (seeking to implement their mobility visions). The growing interest in sustainable finance, such as green bonds, is an interesting avenue to explore. Sustainable financing should be complemented by more support, especially to address operational costs and the

potential needs for maintenance and asset renewal. Cities should have a plan of intended future public transport investments, build political coalitions behind projects, coordinate the different parties involved in planning, and make it easier to secure financing from both government and/or private sources.

In most cases, building dedicated bus lanes and improving the frequency of bus services can be implemented at a lower cost compared to other forms of public transport. On the other hand, large physical infrastructure projects, which typically transport more people without taking up road space – particularly rail and metro – are comparably more expensive, politically complex and tend to take many years to plan, finance, and implement. Generally, infrastructure projects require a comprehensive assessment of what the most viable project is. This requires keeping operating expenses (OPEX) and maintenance costs down. Therefore, public transport needs to be integrated into long-term transport and urban development strategies. New stations and connections create many investment opportunities, for instance for land value capture. Therefore, improved public transport can facilitate development potential and ways to capitalise on this should be sought. This should be based on a thorough assessment of the most appropriate public transport options needed locally.

Earmarking certain revenues for public transport, e.g. from parking policies, road charges, or an Emission Trading System, can also help take pressure off public budgets and user contributions. For instance, the Oslo Package⁶¹, which aims to fund the renewal of rolling stock assets, the upgrade of its ticketing infrastructure and a review of its fare strategy, among others, is based on the revenues collected from Oslo's toll ring. This scheme was implemented from 2008-2030 and is expected to raise 255M NOK annually to fund 60% of public transport's costs. The application of such types of local-based fiscal instruments are very dependent on the local context, governance and the transport framework, which prefer certain types of approaches over others. For that reason, the ability to implement congestion charging, parking levies, employers' or sales taxes, will

⁵⁷ <https://corporatefinanceinstitute.com/resources/knowledge/finance/financial-guarantee/>

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⁵⁹ https://europa.eu/next-generation-eu/index_en

⁶⁰ <https://perspectives-cblacp.eu/frbrouillon-auto/>

⁶¹ https://en.wikipedia.org/wiki/Oslo_Package_1

“Test ride” campaign in Gothenburg (Sweden)

Giving car drivers free public transport passes can convince them to switch to public transport. In Sweden, a new “test ride” campaign lets potential public transport users ride for free for two weeks.

Residents of Gothenburg, Sweden, a city in the southwest of the country with a population of about 570,000, who drive to work or school, were given a two-week free pass to use on buses, ferries, and trams by the regional transport agency. It is a programme that the agency uses to tempt drivers from cars – and it believes it is working.

Since 2010, the agency, called Västtrafik, has launched nearly 30 “test ride” campaigns in western Sweden. When a new resident moves to the area, they are offered one of the temporary passes. Once or twice a year, the agency also runs large outreach campaigns, mailing letters to households in neighbourhoods where car ownership is high, launching social media campaigns, and putting up ads on billboards and the backs of buses to invite commuters to participate. Nearly half a million people have tried the passes, which has led to 100,000 new customers.

In an ad campaign in the Autumn of 2021 the Sweden-based creative agency Forsman & Bodenfors assembled

30,000 toy cars to help residents visualize the impact of the campaign – which had offered 30,000 free passes – on local traffic.

Free public transport passes are one of the reasons people are willing to switch, says Joakim Gustafsson, a project manager at Västtrafik, but “the number one decisive reason for the increase in [public transport] travel is a conscious investment in more vehicles, more lines, and increased frequency,” he said.

In a country where the teenage climate activist Greta Thunberg helped spark the concept of “flight shame” to reduce greenhouse gas emissions, people are increasingly willing to act for the environment, and free travel passes can help commuters who might have already been considering a change to take the next step.

“It’s always a challenge to make people break patterns,” said Gustafsson, noting that for people in certain parts of the region or with unusual hours, public transport may still not be convenient enough. “But as public transport expands, we enable more and more people to evaluate public transport. And we think our ‘test ride’ concept fits perfectly as a constant reminder.”



Source: Forsman & Bodenfors

vary from city to city. Certain competent authorities will require access to decentralised fiscal powers, aligned to their long-term mobility and urban development vision.

In addition, public procurement rules have an important role to play as part of the efficient provision and financing of mobility services inside and outside the city and are an important factor for improving service quality. Member States and cities should, as much as possible, use their wide margin of manoeuvre within these procurement procedures to prioritise accessible, sustainable, multimodal, innovative, and digital solutions in line with their SUMP. They should promote the development of innovative financing solutions, including PSOs (Public Service Obligations), which should be guided by the principles of proportionality, market efficiency and connectivity. Transparent procedural rules, as referred to in the PSO Regulation [Regulation 1370/2007⁶²], are essential to ensure non-discriminatory competitive tenders.

To be able to clearly understand the real mobility needs of passengers, it is important to consult with the relevant organisations, e.g. organisations that represent passengers:

- Competent authorities when drawing up the PSO specifications;
- Transport companies that are awarded a transport contract under Regulation 1370/2007, whenever they want to make changes that affect passengers.

It is also important in such an exercise to consider the needs of vulnerable groups. Some guidance can be found in the European Institute for Gender Equality (EIGE)'s gender-responsive public procurement toolbox.⁶³ Procurement procedures should, as much as possible, include incentives for public transport operators to constantly improve the quality of their service. Shared risks and rewards with transport operators can be developed in the context of PSO contracts.

2.4.3 Give your public transport an attractive identity

Public transport providers must work to overcome common cultural barriers that discourage people from choosing public transport. These will differ from city to city but include ideas, such as that public transport is 'only' for low-income people or people without access to a private car, or that it is unfashionable.

Car manufacturers and new private-car hire companies advertise their products and services using slick and smart public relations campaigns. Public transport operators should do the same to improve the public image of their services and increase ridership numbers and fare revenues. To do so, marketing campaigns could highlight positive personal stories of how individuals have benefited from using public transport. They should also be aligned to a compelling branding strategy that gives public transport a clear and attractive public identity.

Corporate culture can also contribute to improving the image of public transport. A corporate public transport culture that focuses on service excellence should, by default, ensure that the workforce represents its citizens. As a service for all, public transport must strive to recruit people from all types of backgrounds to better represent customers' needs and make them feel welcome. There are several measures that public transport can implement to make its workforce more diverse and inclusive, and become competitive in the recruitment market, for instance, improve female representation and inclusiveness in the workforce, ensure regulatory compliance, allow professional development and academic training, address the wage gap, and support women by providing them with adequate facilities (including sanitary facilities) and the appropriate tools to do their job. Having a diverse and inclusive workforce is directly linked to innovation and creativity, which translates into better customer experience, improved service quality and a stronger brand.

To improve the experience and image of public transport, the emphasis should be on the experience, both in stations and on public transport vehicles, e.g. the ability to relax, sleep, work, read, etc., while travelling.

Promotional schemes and incentives can encourage non-users to try out public transport. Users of public transport are generally more positive than non-users, so encouraging them to take this first step is important. This is, for instance the case in the "Test ride" campaign⁶⁴ in Gothenburg (see box below). Incentives would also work for leisure travel (e.g. weekend or group discounts).

⁶² <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32007R1370>

⁶³ Gender procurement | EIGE (europa.eu)

⁶⁴ <https://www.fastcompany.com/90415911/giving-drivers-free-transit-passes-can-convince-them-to-ditch-their-cars>

Co-creation with children – designing a ferry stop



Source: Västtrafik

Västtrafik, the transport operator of Gothenburg city and region, Sweden, has a vision that sustainable development should be the norm and that public transport should contribute to an equal society. Children represent a large group of travellers who, unlike adults, are dependent on public transport for their independent mobility. When children travel on public transport, it contributes to their autonomy, while at the same time improving their physical health compared to those who travel by car. It can also develop their social and practical skills. Unfortunately, most cities and public transport systems are not designed for children and children do not have the power to influence city planning – how roads are built, the location of schools or bus-stops, etc.

To create an attractive public transport system for all its citizens, Västtrafik started a co-creation project with children to include them in the early planning stages. It was important to understand the needs of children and

how they experienced the environment of public transport. The project aimed to help Västtrafik come up with a proposal for a design of a new ferry stop.

Half of the children included in the project had had a daily experience of traveling by ferry, and half of the children had had no experience. The workshops were laid out in a playful manner, both at the ferry stop and in the classroom with pens and pencils. Co-creation is about learning by doing and encourages experimentation.

The result was a design proposal full of colour and playfulness, with circular forms. For Västtrafik, this was an important experience to continue the work of including a child's perspective, and that of other groups of society, in the early stages of public transport plans. The project is part of ElectricCity⁶⁵, which is a collaboration between industry, academia and society, to develop and test solutions for sustainable public transport in the future.

⁶⁵ <https://www.electricitygoteborg.se/>

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