SOCIAL CLIMATE FUND
Public Transport and Shared Mobility EGUM Subgroup

Adopted by the EGUM Plenary on 10.06.2024

Register of Commission Expert Groups and Other Similar Entities, code number E03863

The Social Climate Fund should be used to fund the expansion of public transport services as our regions' mobility backbone to ensure that public transport, sustainable mobility on demand, shared mobility services and active mobility options are available to everyone and are an option for vulnerable citizens. Investing significant parts of the SCF in public transport and shared mobility services will support a just transition and enable sustainable and affordable mobility for all.

1. CONTEXT

The Social Climate Fund (SCF) was created alongside the EU Emissions Trading System 2 (ETS2) for emissions from fuel combustion in buildings, road transport, and additional sectors. With an implementation period from 2026 to 2032 and a budget of 65 bn Euro, it will provide Member States with dedicated funding so that affected and vulnerable groups, such as households or transport poverty, are directly supported, and not left behind during the green transition. In the current framework, those already affected by Transport Poverty are among the most vulnerable to the economic impacts of the energy transition.

The EU Regulation establishing the SCF defines "Transport Poverty as individuals' and/ or a households' inability or difficulty to meet the costs of private or public transport, or their lack of or limited access to transport needed for their access to essential socio-economic services and activities, taking into account the national and spatial context."[1]

Some of the elements leading to transport poverty suggested in the literature include (1) no transport availability (the physical lack of transport options or very low frequency provided by existing services, also referred to as mobility poverty); (2) no accessibility to transport (for disabled people for instance); (3) low transport affordability (inability to meet the cost of transport); (4) too much time spent travelling (also referred to as time poverty); (5) inadequate transport conditions (available transport options are dangerous or unsafe)[2]. Other dimensions of transport poverty are **housing and gentrification**, where residents with lower economic resources are pushed to other urban or suburban areas. Also, **rural and remote areas,** which experience more accessibility problems as services and infrastructure are not homogeneously distributed, are subject to transport poverty. Furthermore, as **technology transforms transportation**, socio-economic and vulnerable groups may be left behind. Access to IT infrastructure, equipment, and digital literacy plays a crucial role in bridging this gap.

While these tangible factors to transport poverty are undisputed, they fail to incorporate the social impact of transport poverty. This **missing social dimension** must be incorporated in transport plans seeking to address the matter of transport poverty.

Often, the ability to access employment is considered as a key issue when addressing transport poverty. However, it is important not to overlook other significant activities that also create a need for transport. To ensure that measures dealing with transport poverty truly enhance the quality of life for vulnerable groups, these other activities must be taken into account. These include:

a) **Access to activities associated with fundamental rights, including health care, social services, and education among others.** The elderly and youth population in particular are very

[1] Regulation (EU) 2023/955 of the European Parliament and of the Council of 10 May 2023 establishing a Social Climate Fund and amending Regulation (EU) 2021/1060

[2] https://www.europarl.europa.eu/RegData/etudes/ATAG/2022/738181/EPRS_ATA(2022)738181_EN.pdf

negatively affected by the lack of acceptable transport options to fulfil transport needs related to these activities.

b) **Complex trip patterns, as a result of care work and household errands (trip chaining).** This combination of multiple journeys is more often associated with women and caregivers. Besides commuting to work, there are several other trips that this target group does. Among others: taking children to school, buying necessities and/or looking after an elderly family member. The lack of frequent public transport options, or the complete absence of the system, results of more difficulties for this group given the nature of their "trip chaining" patterns. This leads to extra waiting times and detours which links to time poverty.

c) **Longer distances due to overall fewer locations to fulfil necessary everyday activities and fewer transport options due to lower densities in suburban, peri-urban, and rural areas.** For millions of Europeans living away from urban centres, the lower densities naturally result in longer journeys and thus relatively higher transport costs – regardless of the mode of transport. Providing acceptable public transport options in the traditional sense (regular services during all day) is expensive and often inefficient in these areas, due to naturally lower and scattered demand and long distances, even more so when it comes to off-peak hour trips and complex travel patterns.

The issue of transport poverty even persists in households that own a private automobile, as the car may be occupied for the work commute of one household member during the day, when all other errands occur as well. Particularly, individuals and households with low income are very vulnerable of becoming captive users of public transport despite the service not being adequate for their needs – either because there is no car, or the car is occupied for a work commute and stands idling on a company parking lot all day. In some other cases, they are forced to gravitate towards captive use of a car that binds a substantial amount of their income to transport, simply because there is no other option. The factors driving that "choice" are of a structural nature: if there is no proximity of use and the options available to fulfil the resulting transport demand are inadequate in terms of time-cost and safety, there is – in practical terms – no real freedom of choice.

How to address the conflict between efficiency (transition to zero emissions) and social justice?

The significance of public transport and shared mobility in facilitating mobility for communities, economies, and society at large has been a paramount, catering to various local, regional, and national goals.

Today, its role has become pivotal in the worldwide endeavour to reduce carbon emissions in transportation. Currently, the transport sector contributes to 23% of global emissions[3], and despite an increasing demand for mobility, emissions have not yet decreased due to the challenges in decarbonizing all modes of transportation swiftly. One technology-centric solution to the emission problem in transportation is the transition to alternative fuels and propulsion technology, with the electrification of vehicle fleets arguably being the most mature and wide-spread applied technology pathway currently available at scale. The switch towards a propulsion system is necessary and widely supported by governments. Public authorities have a two-fold role to play in this transition. Firstly, to support the implementation of charging and alternative fuel infrastructure in order to achieve a widespread adoption; and secondly, to decarbonise their own public road vehicle fleets. At the end,

[3] The Future of Public Transport Funding – International transport forum – research report 2024

the public authority should set a good example: *When authorities invest in green public fleets, it inspires and incentivises other road users to make the switch themselves.*[4]

The Future of Public Transport Report by ITF underlined, *"Electrifying the private vehicle fleet will contribute to the decarbonisation effort, but deployment cannot happen fast enough, and it still leaves the issue of severe congestion in our cities*"[5]. Neither does it address the issue of excessive use of space, costs involved, inefficient use of energy, road deaths and other externalities that car-centric transportation suffers from.

A focus on electrification (or decarbonisation at large) of the private vehicle fleet may take longer than expected, as there are still considerable emissions embedded in the global automobile supply chain, especially in the case of battery-electric vehicles. In addition, the higher price point of electric vehicles and the very slow development of a second-hand market may further exacerbate inequalities as the structural issues of transport poverty are not addressed while vehicles themselves get more expensive. With many European cities introducing low-emission zones (LEZ) to tackle urban air quality issues and accelerating decarbonisation of vehicles, there is a real risk of exclusion particularly towards groups of citizens that are already prone to transport poverty. This exclusion could increase if society fails to develop comprehensive alternatives that allow a reduction of car dependency for vulnerable citizens in particular.

A prioritization of modal shift from private cars to public transport (traditional line-based and on-demand services) and shared mobility options become essential in decarbonization strategies, especially for local journeys and the connection of urban centres with their suburbs and peri-urban areas. Achieving this transition requires innovative strategies that recognize and address the current subsidisation of inefficient, often ineffective and, for a large group, impossible to attain car-centric transportation. Significant enhancement is needed to create adequate, accessible and acceptable public transport and shared mobility options that become the natural choice for the vast majority of journeys and transport needs. This reduction of car dependency is best achieved in tandem with a reduction in car use through space limitations and a fairer share of costs related to driving. Most of these costs are currently borne by all society at large hence, also by the majority of citizens that do not drive cars.

However, a major challenge is securing adequate funding and financing for these dual transition strategies. This is especially difficult given the urgency of the transition and the substantial initial investment needed. Significant start-up costs are required before the benefits of increased public transport coverage and improved service quality can be recovered through higher ridership resulting from the transition.

Within the framework of the SCF, it is crucial to recognize that vulnerability to fuel price increases stems not from the choice of owning and using a car itself, but from the lack of alternative choices that lead to captive usage. Therefore, the focus should be on promoting alternatives rather than perpetuating car dependence by subsidizing specific transition costs (like the increased purchase price of electric vehicles) that themselves are symptoms of the underlying inefficiencies of car-centric transportation. The key question isn't whether passenger cars are indispensable, but whether their ownership and usage are necessary, which they are not. Business and technological innovations in public transport, along with successful examples of bike- scooter, moped- and car-sharing as well as

[4]World Economic Forum: https://www.weforum.org/agenda/2021/02/how-electric-fleets-can-fuel-decarbonisation-efforts-zeuf/

[5] The Future of Public Transport Funding – International transport forum – research report 2024

carpooling, demonstrate the potential for overcoming individual car dependence while simultaneously providing a true solution for those who are already unable to properly participate in society due to their impossibility to afford to own and operate a car.

How to target the SCF to address transport poverty and those citizens more impacted by the transition to zero-emissions?

Mobility remains one of the main levers for decarbonisation and for the reduction of greenhouse gas (GHG) emissions, through the electrification of engines and the development of alternative fuels. **In particular the potential for the massification of flows and consolidation of journeys enabled by public transport** led to overall significantly higher energy efficiency in the transport system.

This can be seen in the commuter journeys from suburbs and peri-urban areas: GHG emissions from journeys from these areas to the centre of metropolitan areas are generally 25 times higher than those from journeys within both origin and destination closer to the heart of conurbations.[6] This even though outside of more dense urban areas, it is commuter journeys where the share of public transport is highest.

In the research study "Vulnerability to Fuel Price Spikes"[7], it is highlighted the low elasticity of fuel expenditure by low-income households in sparsely populated areas as a function of price trends. Cities, particularly those on the outskirts of metropolitan areas, have the highest proportion of households using cars for their home-to-work journeys, and the lowest median income per capita, making them most vulnerable to fuel price increases. These lower-income groups are more likely to have “non-teleworking” jobs and are more likely to do shiftwork with staggered hours (early mornings or late evenings) when public transport is least available. They do not have the opportunity to reduce the number of journeys they make but are the most affected if public transport is not available.

Throughout Europe, a notable scarcity of efficient nighttime transportation options persists. Typically, employees and workers whose shifts fall outside the operational hours of standard public transport services are forced to depend on their private vehicles, often resulting in a diminished interest in such job opportunities. This can include public transport workers working at the start and end of operational hours, who are vital to expanding transportation options. Exploring safe and accessible alternatives to private car commuting for employees travelling to and from work can help tackle this challenge and support labour market integration of vulnerable groups at the same time.

Improving public transport access within and between suburban and peri-urban areas as well as establishing public transport connectivity within business and employment centres, also under consideration of the respective transport needs of workers (e.g. suitable options for shift or night workers), meets a twofold social challenge. First, bridging the territorial socio-economic division through better overall access to mobility for all as a prerequisite for access to education, public services, good employment and lifestyle functions that allow true participation in society. Second, improving household purchasing power by reducing the share of transport as constraining item of expenditure.

In the same context, accessible public transportation significantly contributes to the participation of people with disabilities. It enables individuals with disabilities to reach their places of employment independently and flexibly, increasing job opportunities and reducing dependence on specialised

[6] Reichert, Alexander & Holz-Rau, Christian & Scheiner, Joachim. (2016). GHG emissions in daily travel and long-distance travel in Germany – Social and spatial correlates. Transportation Research Part D: Transport and Environment. 49. 25-43. 10.1016/j.trd.2016.08.029.

[7] Vulnerability to fuel price spikes. The French case 1984-2018. Jean-Loup Madre and Yves Bussière

transport services. This supports independence and self-determination in professional life and aids in accessing the labour market.

Cycling can complement public transport by providing an affordable way to access basic and essential socioeconomic services and activities in the nearby environment to some groups vulnerable to transport poverty. However, evidence shows that people at risk of transport poverty are not able to afford bikes (e-bikes, e-bike sharing, cargo bikes) without public funding. Funded cycling interventions have a proven track record of overcoming this cost barrier and successfully reaching people experiencing and at risk of transport poverty. Cycling, including e-bikes, can be easily made available to people at risk of transport poverty of all ages and abilities – in urban, peri-urban as well as rural areas. Purchase premiums, subsidized e-bike sharing, SME grants, leasing, targeted infrastructure are examples of initiatives that ensure basic goods and services, jobs and other socio-economic opportunities are more accessible by bicycle to the target population.

How to consider the links with urban/territorial planning and the location of social infrastructure, housing developments, etc.?

Transport demand in suburbs and peri-urban areas, especially transport needs associated with commuter journeys, continue to rise under the combined effect of demographic pressures and housing costs, that supports an urban sprawl in the form of car dependent settlements. Car dependency results in the locations of daily activities being increasingly further away from living areas with ill-conceived connections. For instance, low densities and car-centric planning led to a scattered development of life activities along arterial roads at the fringes of settlements. Halting – let alone reversing – this development is possible but requires decisive action.

Distances in many European suburbs are relatively short compared with other parts of the world. Mixed-used developments but also a clear densification and concentration of daily functions in attractive, walkable neighbourhoods around public transport stations and in town- and village centres have the potential to bundle mobility demand, make public transport cost-effective and increase the usability of shared-mobility options as well as walking and cycling – even in currently more car-centric suburbs – creating more liveable, inspiring, productive, and competitive places.

To orchestrate metropolitan mobility and spatial development, local and regional authorities prefer adopting urban master plans that will determine the future location of major transport infrastructures, housing and business quarters as well as social facilities. These guidelines will be imposed as basis for other plans such as the Sustainable Urban Mobility Plans (SUMPs) of a city or transport authority.

SUMPs are the cornerstone of European urban mobility policy. The European Commission strongly recommends that European towns and cities of all sizes embrace the concept of SUMPs. These can improve the overall quality of life for residents by addressing major challenges related to, for example, congestion, air/noise pollution, climate change, road safety, and parking. SUMPs also provide a framework for innovation and the integration of new mobility services.

SUMP planning and monitoring are key for the organisation of the mobility in cities, defining strategies for the different challenges and actions aimed at achieving ambitious objectives for the evolution of sustainable mobility. For instance, significantly increasing the use of public transport and active modes and reducing road traffic. Funding is needed to complement the measures of the Sustainable Urban Mobility Plans (SUMPs) with shared mobility solutions.

How to ensure the consistency between the SCF investments and the relevant EU, national and regional strategies?

The Social Climate Fund should reaffirm and contribute to the EU's strategic goal of a transition towards an effective, energy efficient transport system and support the shift towards consolidated transport solutions, as proclaimed in various transport white papers and culminated in the Green Geal and its underlying Smart and Sustainable Mobility Strategy.

The SCF should therefore reassure the recognition that public transport, as a socio-technical system, is readily available now and able to address the various challenges of the transport sector and that our society at large is currently facing, in particular the issues of transport poverty and emissions reduction. This positive potential is further increased, when Public Transport is considered holistically, including demand-responsive PT and shared mobility services, and reinforced by consistent walking and cycling infrastructure:

Positive aspects of public transport, shared mobility and active mobility: The Smart and Sustainable Mobility Strategy in combination with the Framework for SUMPs clearly stipulates the central role of public transport complemented with active modes as the backbone of mobility. Earmarking substantial SCF resources to the physical expansion and service level increase of this backbone directly ensures consistency of regional developments with overall EU goals and strategies. It also allows national programmes to further strengthen these developments by increasing these respective funds at their end.

2. Principles for Action

In our current, car-centric transport economic framework, those affected by Transport Poverty are among the most vulnerable to the economic impacts of the energy transition. The source of that vulnerability is not the energy transition per se, but Transport Poverty itself.

The SCF must therefore recognise Transport Poverty as the underlying problem and use its significant funds to address its root cause of vulnerability in a systemic and sustainable manner, rather than engaging in shallow relief of new symptoms to the old problem that are brought about and made visible by the exacerbating impact of the energy transition. The SCF has the potential to make the energy transition socially viable and net positive in the long-term, by tackling Transport Poverty, not doubling down on it by simply supporting an energy transition of an inadequate, unaltered system with all its shortcomings.

With this in mind, the following critical principles for action should guide the establishment and management of the SCF going forward:

- Transport Poverty is a structural problem that requires structural action. Mitigating temporary measures will just delay action. Transport Poverty is structural, not contingent; it has been driven and is sustained by structural factors. These factors can be dealt with.

- Transport Poverty is a local and regional problem, which must be assessed and addressed at the regional scale. It is about difficulty in accessing the places and services or everyday life, from education and jobs to health and social care.

- Transport Poverty is defined by an insufficient level of accessibility. Addressing it requires establishing, first, what is to be considered a sufficient level of accessibility. This is an

intrinsically political decision, which must address human rights and local context, available resources, and existing constraints. This decision must be taken by those who have the legitimacy to lead on the regional context, and that will have the responsibility of finding practical solutions to address its implications.

- Regional and local governments are also the best placed to mobilise endogenous resources to these challenges. They are also the most suited to find creative solutions in partnership with civil society, to tap community ties and trust as an economic resource, to find measures that provide practical, viable and fast solutions, and to benefit from these measures as a way to advance sustainable, safe and equitable mobility. Governments can also stimulate, engage and support the regional business community, through regional-based solutions with local labour, local business, and local resources. These solutions are the most efficient, fastest, reliable, and will provide the best return on investment.

When following these principles, the SCF has the potential to:

- Eliminate transport poverty in a sustainable manner and provide economic impulse through the inclusion of groups of society currently barely able to share in economic activity;
- Support the transition towards a resilient, energy- and resource efficient transport system that reduces the EU transport sector's need for imports of energy and strategic materials;
- Create more productive and healthy places, increasing our communities' and industries' competitiveness and sustainable growth potential;
- Increase consistency between EU, national and regional transport strategies and strengthen the alignment of actions on all levels with the EU's overall strategic goals.

3. Examples of effective good practices of readily available, sustainable transport poverty mitigation measures

A. Public Transport enhancements

<u>Île-de-France Region: New Bus Rapid Transit (BRT)</u>

Île-de-France[8] is gearing up for a significant enhancement in its public transport system with the introduction of a Bus Rapid Transit (BRT) plan slated until 2030. The new BRT for Île-de-France is an answer to public transport inequality access and an ecological, economical, comfortable, and efficient alternative to the use of individual cars for the most vulnerable people.

The BRT deployment will offer a credible and efficient alternative for homework and home-study travel:

- Connecting living areas to the structuring polarities of the region
- Connecting the outer suburbs to the future Grand Paris Express
- Opening up isolated territories

These lines will use the road network already very developed in Île-de-France and they will complement the rail network and the existing bus network.

[8] https://www.polisnetwork.eu/member/ile-de-france-mobilites/

What is new?

The comprehensive plan outlines the **deployment of forty-five new express lines by 2030**, supplementing the existing network of approximately **fifty bus routes in the outer suburbs**, which are also set to undergo reinforcement. Commencing operations post-2024's Olympic festivities, the initial lines will leverage sustained infrastructure improvements, particularly on major arteries like the A1 and A13.

A substantial investment of between 150 and 200 million euros is earmarked for infrastructure development, including the **establishment of multimodal exchange hubs**, overseen by Île-de-France Mobilités. Additionally, seventy million euros will be allocated towards operational expenses, chiefly for the procurement of approximately **200 high-quality service buses**.

What is to come?

This dynamic plan underscores a commitment to regular updates and refinement, with scheduled revisions every two years, ensuring alignment with evolving transport needs and infrastructure advancements across the Île-de-France region.

<u>On-Demand-responsive transport in Île-de-France region</u>[9]

Île-de-France Mobilités (IDFM), the regional transport authority, has developed a simple and practical solution with a new demand-responsive transport offer to meet the residents 'needs who are far from the existing transport network located in the centre of the region. IDFM complements the existing transport network with this new mobility offer to allow residents to access a station, a bus line, or important facilities such as hospitals, shopping, or cultural centres, etc.

How it works?

- Booking online: the on-demand-responsive transport has a defined route and stops. Passengers will book their travel online.
- By geographical zone: no route is defined. The shuttle will run in a dedicated area. The bus route will be organised with the users' booking accordingly.

This service was regionalized in 2019, to pursue the deployment in the outer suburbs with a target of forty labelled services for the period 2022-2026. The on-demand-responsive service is the adequate social answer, in the current context of energy crisis, and more broadly to "transport poverty".

To make this service accessible to everyone, IDFM has also developed a new simple and comprehensive app for users. 767 cities are served by this service (i.e. half of the 1,268 cities in Île-de-France). With a million and half trips made since June 2019, IDFM considers it as a success. Users also largely appreciate the service, with an average rating of 4.78/5.

<u>Vienna, Lisbon, Tartu: LIFE MOONSET Project</u>

During the three-year LIFE MOONSET project period, three urban areas in Austria, Portugal, and Estonia, of which two are metropolitan regions, together with accompanying partners, will design,

[9] https://www.iledefrance-mobilites.fr/en/the-network/mobility-services/transport-on-demand

implement, and evaluate an innovative demand responsive transport (DRT) shuttle service for nocturnal workers, which allows them to travel to/from work without owning or using a car. DRT shuttle service tests will be conducted firstly in Vienna and Lisbon, followed by Tartu, which will then execute a replication pilot action drawing on the learnings of the first two pilots.

LIFE MOONSET evaluates a common approach of all project applicants, which focuses on:

- decreasing the emissions of greenhouse gases generated by transport.
- targeting employees of public services and employers with challenging working hours to reduce their dependence on private car ownership.
- improving access to workplaces for socio-economically disadvantaged staff members.
- nudging employees towards sustainable mobility behaviour.
- supporting EU cities in their endeavours to achieve climate neutrality and mitigate environmental impacts.

The main outputs of this project comprise:

- the development of an optimized algorithm that balances cost, travelling time, waiting time, pooling success rates and coverage of operating areas.
- an on-demand pooling transport technology solution.
- a measuring methodology for assessing negative environmental impacts saved by employee shuttles.
- a calculation guideline for simulating potential effects when upscaling and transferring our pilot actions to different settings.
- a guideline for applicable nudging methods and tools to incentivize sustainable mobility behaviour.
- a standardized concept for DRT services catering to nocturnal workers across various city-employer settings.
-

This concept is adaptable to individual needs while remaining transferable between contexts.

The project's ambitious target is to achieve a **minimum 80% reduction in CO2 emissions per person-kilometre** when compared to the emissions generated by passengers' previous modes of transportation. In Vienna, Lisbon, and Tartu, it is expected that by the end of the project, approximately 55%, 43% and 25%, respectively, of eligible employees will have switched from using their private cars to utilizing the shuttle service as their primary mode of transportation.

The **modal shift from private cars to the shuttle service** contributes to a more sustainable and environmentally responsible transportation system. Participants are expected to **save commuting costs** (variable costs) by using shuttle-service (1,395€/trip in Vienna compared to the initial scenario (private car usage)). Commuting Costs for participants are calculated using average values for fuel and consumption in urban areas, including overhead costs associated with private car usage (depreciation, insurance, taxes, and duties per kilometer travelled). Conversely, the potential users of the LIFE MOONSET project will benefit from a ticket price that includes not only the basic shuttle service fare but also additional costs like public transport tickets. This integrated pricing approach is crucial for transparency and fairness. It ensures that users understand they are not only responsible for the consumption-dependent costs of using a private car (e.g., fuel), but also for the full costs, which encompass all associated expenses.

Transport for London (TfL): Superloop Bus Network and EV Charging Infrastructure

Transport for London (TfL) has implemented several initiatives aimed at supporting transport vulnerable users, particularly through the development of the Superloop Bus Network[10] and enhanced EV charging infrastructure.

- Superloop Bus Network

The Superloop Bus Network was developed to connect suburban neighbourhoods with inner-city public transport networks, ensuring that residents in these areas have equal access to efficient and reliable public transportation. Financing for this project was sourced from congestion charging, demonstrating a reinvestment of funds into sustainable transport solutions.

The Superloop Bus Network specifically targets transport vulnerable users, such as low-income individuals, the elderly, and those with limited mobility, who often reside in suburban areas and face challenges accessing the city's core public transport services. By expanding the bus network, TfL has improved their ability to travel for work, education, healthcare, and social activities.

Following the introduction of the Superloop, TfL observed an increase in walking, cycling, and public transport usage, indicating a positive shift away from car dependency and towards more sustainable and accessible travel options.

- Scrappage Scheme and Its Effects

A key aspect of TfL's strategy to reduce car dependency was the scrappage scheme, which provided financial incentives for individuals to trade in older, polluting vehicles. One-third of the scheme's participants chose not to purchase a second car, leading to a reduction in vehicle numbers and contributing to decreased congestion and pollution. The scrappage scheme, coupled with enhanced public transport options, offered transport vulnerable users a viable alternative to car ownership, thus reducing their transportation costs and environmental impact.

- EV Charging Infrastructure

To support the transition to electric vehicles (EVs), TfL developed an extensive EV charging infrastructure, with a particular focus on ensuring equitable access.

TfL created a dashboard tool that maps public charging infrastructure against areas of deprivation, ensuring that all communities, including those economically disadvantaged, have access to EV charging stations. This approach ensures that transport vulnerable users, who might not have private charging facilities, can benefit from the shift to cleaner transportation. The tool allows for strategic placement of charging stations, addressing the needs of underserved areas and promoting environmental justice.

- Mitigation Measures and Auditing

TfL redesigned its mitigation measures following external audits to ensure that vulnerable groups were not disproportionately impacted by transportation policies and changes.

Inclusivity in Planning: This included extensive consultations with community groups and stakeholders to understand the specific needs of transport vulnerable users. The feedback led to more inclusive

[10] https://tfl.gov.uk/modes/buses/superloop

and considerate planning, ensuring that the benefits of transport improvements were equitably distributed.

Budapest: Flattening the morning peak curve

Flattening the morning peak curve on the Budapest transport system addresses the needs of transport vulnerable users, particularly schoolchildren and students, by ensuring safer and more comfortable travel conditions.

During peak travel times, specifically between 07:00 and 08:00, the system reaches its maximum capacity, making it difficult to accommodate all passengers safely. To alleviate this, the Public Transport Authority (PTA) implemented measures to shift some journeys outside of the peak period. This initiative began during the pandemic to ensure social distancing and continued post-pandemic to maintain comfortable and convenient services for passengers.

One-third of peak-time passengers are schoolchildren, many of whom travel independently. By targeting this group, the PTA identified that rescheduling their travel could significantly impact peak congestion. Consequently, a proposal was made to local authorities to shift the start time of the first school lesson to 09:00 or later, thereby encouraging students to travel between 08:00 and 09:00, after the peak rush.

Through discussions and effective communication with stakeholders, including schools and universities, this initiative led to the municipality introducing new public transport timetables that extended maximum capacity until 09:00. By the start of the 2020 school term, at least 15-20 high schools and several universities adopted the new schedule. This change ensured that transport vulnerable users, especially students, could travel safely and comfortably, avoiding the overcrowded peak period.

Groningen-Drenthe: Redesigned Public Transport Networks and Hubs

The Provinces of Groningen-Drenthe[11] redesigned their network with mobility hubs to ensure smooth transfers and additional services to communities. High-quality public transport provision is provided by train and bus rapid transit (BRT) services. Feeder bus lines and additional on-demand networks connect the mobility hubs.

B. Inclusivity and equity in transport

Helsinki: Transport Poverty research and measures for the elderly

- Transport poverty research identified the elderly population who were no longer driving but also not using public transport due to a lack of confidence. Identified as a critical issue to avoid isolation and physical inactivity.
- Measures developed such as free transport for users and companion/guides.
- Adapting services such as extending public transport networks to those areas and improving mobility hubs as the elderly find switching modes to be a barrier, having covered walkways as the icy winter weather can make moving around dangerous.

[11] https://cms.uitp.org/wp/wp-content/uploads/2022/02/Knowledge-Brief-Rural-Mobility_FEB2022-web.pdf

City of Hasselt and Leuven's Mobility Budgets[12]

These initiatives offer citizens a pre-defined budget to spend on various transport modes. This approach encourages the use of public and shared transport options, supporting the shift away from private vehicle dependence. The flexibility and inclusivity of mobility budgets can serve as a blueprint for other cities aiming to diversify transport usage and reduce transport poverty.

Grenoble: Solidarity Pricing[13]

Concessionary fares are variations on the basic types of fare structure and are used in conjunction with the conventional basic fare system to **attract targeted groups of passengers.** These can include fares for: children, pupils and students, the elderly and the disabled among other categories. Different calibration methods to better target social fares.

Solidarity pricing in Grenoble: the preferential fares set until 2009 offered reduced prices established within a specific framework that did not reflect the social realities of the conurbation. They represent a 15% of the total trips made in the networks.

- Most citizens over 60 were economically better than citizens under 40.
- Employment seekers could live in households that could financially cope.
- Sep 2009 – 52,000 had concessionary fares (free or quasi-free).
- Methodology – 5 distinct categories setting different coefficients provided guidelines via formula.
- New categories included: job seekers, students, and young workers – enabling intergenerational solidarity between (19-25 and 65+)
- 33,000 users pay more through increased fare, enabling 60,000 users to benefit from solidarity pricing.

At the present time, there are over twenty-two cities that have deployed a solidarity pricing scheme (as opposed to free fares) which is directly linked to the household income as establishes a wide range of pricings available to families based on a set family quotient.

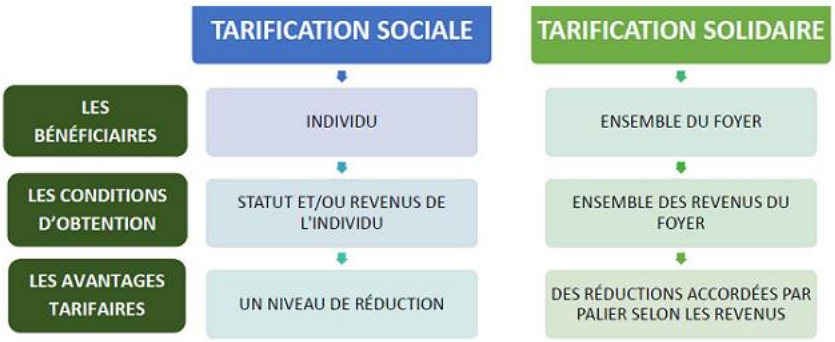

Figure 1. Tour de France GART-UTO, Optimizing the resources of the public transport[14]

[12] https://www.tmleuven.be/nl/project/Mobiliteitsbudget-Hasselt-Leuven
[13] https://www.cerema.fr/fr/actualites/tarification-solidaire-transports-collectifs-urbains
[14] ibid

Brussels: Vélo Solidaire, Bruxell'Air Subsidy and inclusive carsharing

The Brussels Capital Region has developed different transport measures that target the most vulnerable including for example:

- Vélo solidaire[15] : A bike leasing scheme to support cycling school process for disadvantaged residents which includes: A bike leasing scheme to support cycling school process for disadvantaged residents which involves:
    - Free leasing of a bike for one year with the opportunity to buy it afterward;
    - Training: basic riding skills, how to ride in the traffic, mechanics;
    - Public reached through field organisations.

- In the context of the Low Emission Zone in Brussels, supporting measures have been developed such as:
    - the Bruxell'Air subsidy in case of car number plate scrapping in which citizen may receive a mobility budget. The amount is based on the household's revenue or the presence of a person with disabilities in the household (505 €, 705 € or 1010 €). 7 mobility operators offering various mobility services can be selected within the budget.
    - Mobility coach offers free, personalized sessions to ask all your questions about getting around Brussels. It also offers free, personalized sessions to ask all your questions about getting around Brussels.

- The "Green Deal Inclusive Carsharing" aims to give a sustainable and inclusive boost to carsharing in Brussels. In February 2024, more than thirty organisations signed up for this commitment. The aim is to extend the use of carsharing to families (single parents), people with reduced mobility, senior citizens, low-income households, people with a digital divide, etc. It aims to give a sustainable and inclusive boost to carsharing in Brussels. In February 2024, more than thirty organisations signed up for this commitment. The aim is to extend the use of carsharing to families (single parents), people with reduced mobility, senior citizens, low-income households, people with a digital divide, etc.

- A call for projects was also launched last year to boost the inclusive carsharing offer. The amount of 400 000 euros will be allocated to the five selected projects:
    - *La Ligue des familles*: pilot project - car sharing for families with children.
    - Community Land Trust Brussels (CLTB): with the shared electric car project for residents of social housing in the Brussels-Capital Region.
    - Mpact with the project CozyCafé, car sharing in Brussels neighbourhoods.
    - WeTechCare with the project called 123 Carsharing 4 BXL.
    - Cambio: children seat available for families and single parent families.

- Accessibility in public transport is part of the Mobility Regional Plan and the management of the Transport operator STIB[16]. This is implemented through an Accessibility Plan with concrete actions such as adaptation of the above the grounds stops to make them accessible, audits, installation of lifts in metro station, audio announcements on the vehicle fleet (To make travelling on public transport easier for people who are visually impaired or have difficulty reading numbers, an external voice announcement system has been installed.)

[15] https://www.velosolidaire.brussels/homepage.fr

[16] https://www.stib-mivb.be/article.html?_guid=901d3723-ed88-3b10-228d-b93d94ec3397&l=fr

In addition to existing measures, Brussels administrations continue to reflect on the issue of just transition with, for example, a one-day seminar on *"How to reconcile the challenges of sustainable mobility, ecological transition and social equity"*[17]. A new section of the Regional Mobility Commission has been created to discuss social inclusion.

Finally, the Brussels Capital Region has started to cross-reference anonymised data on vehicle ownership, household travel survey and underused surveys in the field of mobility: SILC, household budgets, health, etc. The objectives are to evaluate the social impact of mobility policies in general, and of measures to regulate car use and ownership in particular.

Buddy: Urban support & accessible travel services[18]

Provides a one-stop-shop platform for a wide range of urban mobility needs for people with disabilities including adapted transfers, accessible accommodations, and assistive technology rentals, demonstrating how centralised services can significantly enhance urban mobility for vulnerable populations.

READJUST: Monitoring and mitigating inequalities[19]

A comprehensive initiative aimed at ensuring equitable access to the benefits of Europe's green and digital transformations. Focusing on the mobility and agri-food sectors, READJUST seeks to identify and mitigate potential inequalities exacerbated by these transformations. The project employs a four-step approach: monitoring existing policies, assessing transition processes, co-creating new measures, and evaluating policy recommendations. The project highlights the need for equality-focused policy tools and frameworks in urban mobility.

TandEM Women in Cycling Programme[20]

TandEM Women in Cycling is a train-the-trainer programme for women who want to empower other women to cycle. It aims to increase accessibility and safety for female cyclists by addressing specific challenges they face, such as safety concerns and the need for supportive infrastructure. This programme can guide transport planning with a gender-sensitive lens, promoting cycling among women and contributing to more balanced and inclusive urban mobility.

C. Sustainable mobility solutions

Île-de-France and Vitoria Gasteiz: Carpooling with Karos[21]

In Ile-de-France, the prospective carpooling market concerns 61% of the working population in the outer suburbs who drive to commute and overwhelmingly travel alone (95%). This demographic includes many vulnerable transport users who lack convenient access to public transportation options. In 2018, at the end of a 13-month experiment with the authority, 79% of the trips done with Karos concerned the outer suburbs of Paris, while 36% of overall carpool trips involved municipalities with fewer than 100 residents/km², therefore catering for the least dense areas. From January 2017 to October 2021, almost 3.8 million trips were carpooled with Karos, within 760 suburban and rural municipalities, covering 91% of the region's population. This extensive coverage is critical for transport vulnerable users in rural and suburban areas, where public transport options are limited.

[17] https://environnement.brussels/pro/outils-et-donnees/supports-de-formations-et-seminaires/actes-des-seminaires-mobilite
[18] https://marketplace.eiturbanmobility.eu/products/buddy-service/
[19] https://www.eiturbanmobility.eu/readjust-project/
[20] https://engage.eiturbanmobility.eu/processes/tandemwomen
[21] https://cms.uitp.org/wp/wp-content/uploads/2022/02/Knowledge-Brief-Rural-Mobility_FEB2022-web.pdf

At the core of its success is an AI-powered mobility assistant app that offers reliable carpooling opportunities for daily commuting, including variable working hours and without being tied to a particular car-pooler. Thanks to the intermodal trip planner, carpooling became integrated into the local public transport offer. Twenty-five percent of Karos' passengers only carpool intermodal trips. On average, 2.3 people share each Karos trip against an average of 1.1 pp/car. With an almost 50-50 split between male and female, most users are young professionals under 40. The partnership with the local transport authority, IDF Mobilités, is crucial as it not only remunerates the carpooling partner (B2G) but also finances carpooling at a rate of €2 per trip (contribution paid to the driver). In fact, monthly transport pass holders can use carpooling for free within the limit of 35km per trip and for a maximum of two trips per day. Drivers are paid €1.50/passenger up to 15 km then €0.10/km, which provides an average saving of €92/month. Ticket holders pay just the ticket. These financial incentives make carpooling an attractive and affordable option for transporting vulnerable users, such as low-income individuals and those without regular access to a personal vehicle.

The goals for the authority are to enhance the public transport network's reach and reliability. Carpooling partners of IDF Mobilités, including Klaxit, Karos, and BlaBlaCarDaily, have their trips directly available in the authority's trip planner app, ensuring seamless integration with public transport services.

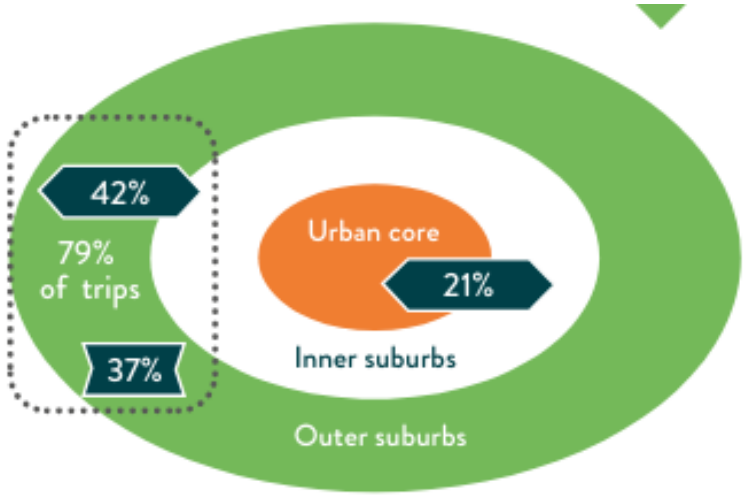

Figure 2. Car pooling figures[22]

This project showcases the potential of shared mobility solutions to complement existing public transport systems. By facilitating carpooling and shared vehicle services, the initiative reduces the need for personal vehicle ownership, thereby decreasing congestion and environmental impact. The Vitoria Gasteiz Pilot is a model for urban areas looking to enhance their transport ecosystem's resilience and sustainability. *Application locations*: Vitoria Gasteiz (Spain), Toulouse (France).[23]

Flanders: Basic accessibility policy[24]

Flanders is the northern part of Belgium, is inhabited by 6.6 million people, and has a high density of 484 inhabitants/km² with more than 300 cities and municipalities, a regional and a federal government. The Department of Mobility and Public Works of the Flemish government (MOW) is implementing soon the "Basic Accessibility" policy that "guarantees the access to important social places on a demand-driven basis by different means of transportation" through a core network,

[22] ibid
[23] https://www.eiturbanmobility.eu/impact-story/intelligent-carpooling-startup-takes-cars-off-the-road-for-lower-commuting-emissions/
[24] https://cms.uitp.org/wp/wp-content/uploads/2022/02/Knowledge-Brief-Rural-Mobility_FEB2022-web.pdf

additional network and first and last-mile solutions. To fulfil its mission, this system should support the economy and society and must be sustainable, safe, multimodal, integrated, and intelligent. To get there, the first step is to transition from “supply-driven public transport” to “demand-driven transport public transport”. For the supply driven, the policy is that every citizen has a bus stop within walking distance (800m). While in rural areas the frequency of services is extremely low, with the innovative approach different forms of public transport are provided depending on the area and its demand: buses, taxis, small buses, shared cars, shared bikes etc. The transfer between one mode and another will be seamless with mobility hubs to ensure end to end transport. Hierarchised public transport networks are used as a tool to structure the connections between various 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 for the core network,

Helsingborg: Nudgd's sustainable mobility project[25]

Helsingborg: Cultivating bicycle culture in schools - Nudgd's Sustainable Mobility Project in Helsingborg: Encourages a shift towards more sustainable transportation among school communities using behavioural science. This project exemplifies how targeted initiatives can lead to substantial changes in mobility behaviour, fostering a cycling culture and sustainable transportation habits among younger generations. *Application location*: Helsingborg (Sweden).

Bremen: Mobility Management for new developments

The Municipality of Bremen modified the local Parking Regulation for Housing Developments (Mobilitäts-Bau-Ortsgesetz) to a framework that enables estate developers to reduce costs and space consumption through requiring them to offer less parking while simultaneously requiring them to create sustainable mobility management concepts. These concepts can include measures such as the provision of car-sharing memberships, public transit passes, the integration of car-sharing stations on the site itself, as well as shared cargo bikes, micromobility and much more. This framework for mobility management in new developments was voluntary from 2013-2022. As of October 2022, innovative mobility management measures are mandatory for all new housing and commercial development spaces. A study of the mobility concepts implemented on a voluntary basis has already shown positive impacts on sustainable travel behaviour – beneficiaries (or ‘users’) of the mobility management measures used public transport and bikes more and used a car significantly less than their direct neighbours (or ‘control group’). This impact could be amplified with more extensive communication to potential residents before, during and after moving in, as this is a crucial moment for mobility behaviour change. As of October 2022, developers are also required to devise a communication concept to accompany their mobility concept.

[25] https://marketplace.eiturbanmobility.eu/best-practices/helsingborg-cultivating-bicycle-culture-in-schools/

MEANS OF TRANSPORT / MODAL SPLIT	USERS	CONTROL GROUP	BREMEN TOTAL
Motorised individual transport as a driver/ passenger	29%	40%	36%
Public transport	17%	10%	15%
Bicycle / e-bike / cargo bike	30%	23%	25%
Walking	24%	27%	25%

Data from the 2021 report "Effectiveness of Mobility Management Measured Implemented within Bremen's Parking Code"

This modified regulation directly benefits vulnerable transport users by:

- Reducing Financial Burden: Car-sharing memberships and public transit passes reduce the need for personal vehicle ownership, lowering transportation costs for low-income residents.
- Enhancing Accessibility: Integrating car-sharing stations and micromobility options on-site provides convenient transportation alternatives for those with limited mobility or no-access to a personal vehicle.
- Improving Mobility Choices: Providing shared cargo bikes and other micromobility solutions enhances transportation options for families, the elderly, and those with disabilities who might find traditional public transport challenging.

Milan/Lombardy Region: Mobility Services for specific user groups

- Specific travel offers and services provided e.g. Amazon workers, working nightshirts/off-peak hours – FNM Group;
- FNM Group are acquiring different mobility services targeting different user groups, e.g BusForFun, to offer a consolidated "Mobility as a Community" framework.

Antwerp: Smart Ways Programme

Within its "Smart Ways of Antwerp programme"[26], the region is actively collaborating with employers and mobility service providers. The programme supports employers in building their company mobility policy, understanding employee travel behaviours, and encouraging the use of more sustainable transport modes. Working closely with mobility providers and the public transport operator, different mobility offers can be made available including public transport, allowing employees to lease a bike, use car-sharing and car-pooling.

Geneva sustainable mobility solutions

- Cross-border collaboration to tackle rural mobility poverty and commuters driving into Geneva.

[26] https://www.slimnaarantwerpen.be/en/home

Geneva has partnered with neighbouring regions to address the challenges faced by rural communities with limited access to public transportation. This collaboration aims to improve connectivity and reduce mobility poverty by ensuring that residents in rural areas have better access to reliable and affordable transport options.

- **TPG Flex: On-Demand Public Transport Services:**

The TPG Flex initiative introduces on-demand public transport services that operate in areas with low population density or limited access to traditional public transport. This service allows residents to book rides via an app, ensuring flexible and convenient travel options that cater to individual needs.

- **Mobility Pricing Pilot:**

The mobility pricing pilot introduces dynamic pricing models for public transport, incentivizing off-peak travel and more efficient use of transport infrastructure. This approach aims to balance demand and reduce peak-hour congestion. By offering lower prices during off-peak hours, the pilot makes public transportation more affordable for low-income individuals and those with flexible schedules, such as part-time workers and students.

The cross-border collaboration and innovative mobility initiatives in Geneva, such as TPG Flex on-demand services and the mobility pricing pilot, significantly benefit vulnerable transport users by improving accessibility and connectivity in rural areas, reducing commuting costs, and offering affordable travel options during off-peak hours. These measures provide flexible and reliable transportation for the elderly, people with disabilities, and low-income individuals, enhancing their access to essential services, employment opportunities, and social activities while reducing isolation and promoting social inclusion.

France - company support to pt tickets[27]

In France, Law No. 2022-1157, promulgated on August 16, 2022, has increased the employer support for public transport tickets, providing substantial benefits to vulnerable transport users.
Increased Exemption Threshold for Private Sector Employees:

- New Exemption Level: The threshold for exemption from covering transport costs has been increased to 75% of the public transport subscription for the years 2022 and 2023.
- Mandatory Coverage: The mandatory threshold for employer coverage remains at 50%.

Benefits for Vulnerable Transport Users

- Reduced Transportation Costs: The increased exemption threshold reduces out-of-pocket expenses for low-income workers, alleviating financial pressure and increasing disposable income;
- Enhanced Mobility: Lower transportation costs improve access to employment opportunities for individuals who may have been constrained by the cost of commuting;
- Job Retention: Affordable public transport options help vulnerable users maintain consistent employment, contributing to job stability;
- Broader Accessibility: Higher employer contributions promote the use of public transportation, supporting individuals without access to private vehicles;

[27] https://www.economie.gouv.fr/entreprises/frais-transport-salaries

- Supporting Diverse Communities: These measures particularly benefit the elderly, students, and those with disabilities by making public transport a more viable option.

Empowering public transport operators to supply on-demand mobility services - Shotl[28]

Targets isolated neighbourhoods with challenging geography by offering a flexible, on-demand shuttle service. This approach addresses the critical need for accessible transport in areas where conventional public transportation is not feasible due to terrain or low demand. Implementing similar services can significantly improve mobility for residents in similar contexts, enhancing their access to essential services and opportunities. Application locations: Torre Baró (Spain).

D. Cycling initiatives

Purchase/use of zero emission vehicles

Reduced prices for bicycles and especially e-bikes through subsidies, long-term rental, and leasing, differentiated by income levels or aimed at lower-income areas at risk of transport poverty. These schemes can be stand-alone schemes with restricted access to low-income households, or additional funding can allow public bodies to increase the discounts to those at risk of transport poverty.

Examples:

- The Bruxell'Air subsidy[29]. This programme shows that when residents low-income in Brussels were offered subsidies across all transport modes the first choice was discounted on bikes, attracting more than double the number of applications compared to any other mode including all public transport and car-sharing options.
- An academic study from Lausanne, Switzerland[30] showed the subsidy available there triggered the purchase of an e-bike (66.9%) specifically among people with low incomes, who buy their first e-bike or a less expensive model.

- Use of these approaches has also been tested in very low cycle use environments such as the USA, which provides valuable confirmation that they can work in settings beyond the high and medium cycle use cities in the EU where many such schemes are piloted. These review papers have the advantage of being academically verified. A particularly strong paper is "Using E-Bike Purchase Incentive Programs to Expand the Market – North American Trends and Recommended Practices"[31] which has extensive recommendations on how to tailor purchase subsidies for low income or other equity goals.

Reduced barriers to ownership and use through subsidies and sharing schemes for specialist vehicles such as adapted bikes, tricycles, and cargo bikes.

Vulnerable groups targeted in case studies include people with disability, health issues, refugees, asylum seekers and older people as well as lower incomes.

28 https://marketplace.eiturbanmobility.eu/best-practices/torre-baro-an-isolated-neighborhood-with-challenging-geography/

29 https://www.dropbox.com/scl/fi/d4w5iucamqf3emq69ormt/Sustainable-mobility-premium-Brussels.pptx?rlkey=xleb0wk18yy2ry4g53oocecvv&e=1&dl=0

30 https://www.tandfonline.com/doi/epdf/10.1080/23800127.2024.2332006?needAccess=true

31 https://www.dropbox.com/scl/fi/mqduuoe8v7fwe5rrbtdp0/E-bike_Incentive_White_Paper_5_6_2022.pdf?rlkey=hw3e1pbsj5iuubjxk0ulzldt6&e=1&dl=0

Specific examples for schemes targeting low-income groups are:

- Cargo bike subsidy scheme for single parents on low incomes in Aachen[32];
- Cargo bike and trailer scheme in Mannheim which offers increased discounts for families with a social pass (low incomes and other needs)[33];
- Cargo bike Stuttgart[34] is a similar scheme for families and single parents that give up a car, with increased discounts on low incomes;
- In the city of Freising[35] scheme only low-income households as well as traders, non-profit organisations, and cooperatives as well as homeowners' associations are eligible to apply for a bike.
- Micro-enterprise subsidies to accept use of cargo bikes for deliveries and services can be targeted at businesses by the size of the enterprise. These can be in the form of low-cost rental and trial services, or discounted purchasing. Extensive examples are available, for example Brussels Cairgo[36]
- E-cargo bike Library – Glasgow[37] shows how small businesses can benefit from community provision of bikes.

Bike sharing as part of public transport

Bike share subsidies, discounting or incentivisation for low-income households or households at risk of transport poverty – improving accessibility, availability and affordability

As with purchasing discounts, these can be schemes that only target low-income households, or they can be additional discounts over and above those already available to the wider public.

Bike share subsidies, discounting or incentivisation which is designed to make bike use more accessible to low-income or at risk of transport poverty households. As with purchasing discounts, these can be schemes that only target low-income households, or they can be additional discounts over and above those already available to the wider public. Below some examples:

- Dott Brussels Micro-incentives[38] piloted a micro-subsidy project to assess the potential of impact funding in areas with relative transport poverty;
- Bolt for All programme[39]: In several cities including Brussels, Bolt offers structural discounts of up to 50% to low-income users and unemployed persons to reduce transport poverty and make shared mobility accessible to everyone;
- PIN Bike gamification for affordability targeted at low-income users, can significantly offset transportation costs, making cycling an accessible and economically viable option, example PINBIKE Italia supported by EU regional funding[40] ;

32 https://www.aachen.de/DE/stadt_buerger/verkehr_strasse/clevermobil/lara/index.html
33 https://www.mannheim.de/de/service-bieten/verkehr/radfahren-in-mannheim/lastenrad-foerderung
34 https://www.stuttgart.de/leben/mobilitaet/elektromobilitaet/lastenradverleih-stuttgarter-roessle.php
35 https://www.freising.de/leben-wohnen/mobilitaet-verkehrswende/lastenraeder#c20877
36 https://www.brusselstimes.com/184018/up-to-e4000-subsidy-for-companies-who-buy-a-cargo-bike
37 https://www.bikeforgood.org.uk/shop/ecargo-bike-library/
38 Dott report on social incentive projects LINK
39 Bolt for all programme LINK
40 PINBIKE https://www.interregeurope.eu/good-practices/pin-bike-the-certified-and-gamification-tool-for-smart-cities

- Bikes for All Glasgow[41] – subsidy and support scheme aims to reduce inequalities in access to cycling through the provision of low-cost bike hire, by building up cycling confidence and by reducing barriers to cycling for first-time or lapsed cyclists;
- Vélo'v Lyon[42] offers free bike sharing for up to a year for young people, students and job seekers across the whole metropolitan transport area (59 communes);
- Grenoble bike sharing service Mvélo+ has an incentive for people and residents according to tax income, with families below a monthly earning threshold getting a special rate on the 9000 bikes in the scheme[43].

Structural projects to enable schemes to expand into low-income areas or areas at risk of transport poverty, targeting by geography and demographics – improving availability and accessibility.

This is comparable to the approach used in public transport where local or regional governments accept that there is a limited commercial incentive to operate in low income or currently low cycling level districts, then an operating grant is supplied to the scheme operator to enable them to operate a viable service in these areas.

Examples:

- Dott Ghent cargo bike expansion to low-income district[44]: The City of Ghent provided Dott and Bolt a subsidy to offer a diverse range of shared bicycles in some peripheral areas not covered before (and in case of Dott, a variety of bikes, including cargo bikes).
- Vancouver Canada – is an example of prioritizing equitable solutions to reach marginalized communities that could benefit from bike share access: subsidizing the membership, introducing cash payment options etc[45].

Recommendations for scaling to national level

All bike sharing schemes in every member state should consider two criteria.

- *Accessibility*. They must establish access to bike sharing in geographical areas of the city/region/town that have a higher density of population that are at risk of transport poverty. This must include districts that are at risk of transport poverty in terms of accessibility because public transport services are not available, infrequent or have low density. The expansion of bike sharing to these geographical areas is funded by partnership with bike-sharing operators (including city owned and managed fleets), ensuring that there is a financially viable operation for those districts. Funding can include capital for docking stations, bikes and service buildings, and it can be revenue aid for operations.

  According to "Shared Ambition"[46], CIE's study into bike sharing in 148 cities analysed cities in the EU Climate Neutral Cities Mission and the largest of the TEN-T Urban Nodes and identified a shortfall of 200,000 bikes, of which we estimated 116,000 bikes can be targeted to expand

41 https://www.bikeforgood.org.uk/shop/bikes-for-all/
42 https://velov.grandlyon.com/fr/offers/groups/list#180
43 https://www.veloplus-m.fr/560-abonnements-et-tarifs.htm
44 https://www.polisnetwork.eu/wp-content/uploads/2023/12/1C.-Sebastian-Schlebusch.pdf
45 https://betterbikeshare.org/2020/01/29/vancouvers-public-bike-share-system-puts-equity-first/
46 https://cyclingindustries.com/fileadmin/CIE_Shared_Ambition_%E2%80%93_Benchmarking_Bike_Sharing_in_148_cities.pdf

city coverage to reach districts at risk of transport poverty. Extrapolated to all EU urban areas, Member States should budget in the SCF for up to €10 million capital for the largest metropoles to €250,000 for a town of 50,000 population. Each city should plan for a density not less than 40-60 bikes per 10,000 inhabitants in districts where the target population lives, noting that this figure applies to scheme extensions where there is already a critical mass of bike sharing in the city to underpin operations. A new/standalone scheme will need higher levels of intervention to ensure bikes are available at destinations as well as areas where people at risk of transport poverty live.

- *Affordability.* Secondly, Member States must ensure that a bike trip (especially an e-bike trip) is available to people at risk of transport poverty at equivalent or lower rates than a subsidised public transport ticket, typically below €2 per trip. This can be a highly targeted intervention as shown by the examples above.

To subsidise the usage of existing schemes or newly extended schemes reaching areas where people are at risk of transport poverty a budget of around €2 per ride should be used as an EU wide benchmark. For existing and extended fleets this has a value for citizens of €1.5 billion per year, assuming this subsidy was over at least two years for effectiveness, i.e.€3 billion. For Member States guidance on SCF budgets, this can be in the range of €25 million per year for the largest metropoles to €350,000 per year for a town of 50,000 population, with operating costs per ride likely to be higher in smaller schemes.

Safe cycling infrastructure to tackle transport poverty

Cycling is an affordable mode of transport for all. Using a recent study on the costs of car use,[47] we found that even when using conservative assumptions about bicycle prices and life cycles, private ownership of a bicycle can be fourteen times cheaper than owning an Opel Corsa and twenty-seven times cheaper than a Mercedes SUV.[48] Recently, more attention in research and practice has been directed towards how this relative affordability can be translated into accessibility for all, meaning the provision of safe and convenient cycling infrastructure also to vulnerable groups such as those with low incomes.

Examples:

- In Scotland, zones with elevated risk for transport poverty plus road safety in deprived areas showed that:[49]
    - 61% of high-risk data zones are areas where essential services can be accessed by bike within 10 minutes. Cycling could present a viable alternative to driving to access services in these areas.
    - At the same time, crashes involving active modes are more prevalent in deprived areas – this is a barrier to more cycling.
    - There is clearly a need for more safe cycling infrastructure to tackle transport poverty and higher.

Researchers from the University of Porto in Portugal have developed a new planning tool for assessing the relative equity impact of bicycle planning (TIRE), which provides a micro-scale spatial assessment

[47] https://www.sciencedirect.com/science/article/pii/S0921800921003943
[48] https://ecf.com/news-and-events/news/lean-green-money-making-machines-comparative-breakdown-financial-benefits
[49] https://www.starconference.org.uk/star/2019/Quayle.pdf

of the effects of cycling network allocation on the accessibility levels of distinct socioeconomic groups. They applied the tool to the implementation of the cycling strategy in Lisbon and could reveal hotspots in the city where the cycling network distribution is equitable and areas where disadvantaged representatives have levels of accessibility below the municipality average, thus requiring special attention during the infrastructure planning process. In addition, the tool supported local planning practitioners in identifying target areas and equity-oriented strategies, increasing awareness about the equity impacts of cycling infrastructure allocation.[50]

Scaling these examples to national level we recommend:

Based on ECF's analysis of OpenStreetMap cycling infrastructure data,[51] we estimate that ca. 100,000 kilometres of additional cycling infrastructure need to be constructed in the TEN-T urban nodes in the EU. With an estimated average cost of €200,000 per kilometre for high-quality infrastructure in urban areas,[52] a budget of €3 billion from the SCF could finance the construction of 15,000 kilometres of cycling infrastructure in those areas that are most exposed to transport poverty.

New Governance approach for New Mobility Services - Impact funding based on defined criteria and objectives

Many case studies like the ones presented above have been developed to overcome transport poverty and achieve better transport justice. In the near future (by 31.12.2027 latest) all TEN-T urban nodes have to have a SUMP in place, with harmonised Sustainable Urban Mobility Indicators (SUMI). While some of them will be auxiliary indicators, others will serve as key indicators to measure progress on SUMP goals.

It will be in the public interest to invest their financial resources where these can deliver the best possible impact towards the SUMP goals. New mobility services like bike, scooter and car sharing or on-demand services deliver desirable impact in terms of transport accessibility, greenhouse gas emission reduction and modal shift. Typically these services, especially when served privately, are constrained in their ability to deliver impact by the need to remain profitable.

The SCF can be used to allocate impact-oriented funds on a local level, to be disseminated amongst mobility service operators to (1) expand their service geography further into the periphery (2) make their rides more affordable to certain groups or everyone and (3) invest into other desirable outcomes to be defined by Local Authorities. The mechanism of **micro-subsidies**[53] or **micro-incentives**[54] can be used to achieve that[55].

Innovative transport technologies

- Vienna: Signal Avatar

A program is currently being developed in the pilot project with which public transport disruption information can be automatically interpreted into sign language. The translation should go directly into an app on deaf passengers' smartphones using animated videos.

Passenger information in public transport is highly standardized. The Wiener Linien takes advantage of this with the sign avatar: the approximately 5,000 stations in the Wiener Linien network and around

[50] https://www.sciencedirect.com/science/article/pii/S0967070X22003560#abs0010
[51] https://ecf.com/ecf-cycling-infrastructure-tracker
[52] https://ecf.com/system/files/The_Costs_of_Cycling_Infrastructure_Factsheet.pdf
[53] https://factual-consulting.com/the-beauty-of-micro-subsidies-a-new-era-in-the-management-of-urban-mobility
[54]https://factualconsulting.medium.com/microincentives-a-game-changing-approach-to-nudging-for-sustainable-mobility-behaviour-c1f69934396d
[55] https://medium.com/@erdemnino/growth-vs-de-growth-or-else-93b39d0bfae2

thirty types of disruptions can be translated in advance. In the event of a malfunction, the information is translated almost live and automatically from spoken into sign language. The animated videos are to be played in the WienMobil app, which accompanies Viennese through every day public transport with digital tickets and passenger information.

- Vienna: Audio-guided navigation (Dreamwaves)

Dreamwaves[56] provides a unique audio-guided navigation system that enhances urban accessibility, particularly for individuals with visual impairments or those unfamiliar with city layouts. By integrating this solution, cities can make their public spaces and transport systems more inclusive, ensuring all citizens, regardless of physical ability or familiarity with the area, can navigate urban environments confidently and safely.

- Spain: Digital Bus (Nemi)[57]

This innovative solution revolves around a digital Demand-Responsive Transport (DRT) platform that revitalises areas previously considered "transport deserts". By leveraging technology, the Digital Bus project offers dynamic routing and scheduling, adapting in real-time to user demand, thereby significantly enhancing transport availability in under-served regions. This model can be replicated in various EU environments to bridge transport gaps, particularly benefiting regions with low population density or insufficient traditional public transport services.

- Andyamo API[58]

Offers tailored commuting solutions for individuals with reduced mobility, integrating information on accessible pathways, ramps, and crossings, thus facilitating safer and more comfortable urban navigation.

Examples of the Taxi industry by Taxis4SmartMobility:

The taxi sector rendering public transport safer and more accessible

Accessibility: Taxi 4 Smart Mobility (T4SM) German member Bundesverband provides a more accessible transportation option for the elderly, disabled, and ill. By collaborating with 93 German insurance companies, BVT ensures safe and swift transport to and from hospitals and medical centres. The taxi sector plays a crucial role in ensuring accessible transport for the most vulnerable users, with 38 million medical trips made by taxis annually.

Safety*:* In Denmark, the Danish member of T4SM, Dansk Person Transport, has found that taxis have become the preferred mode of public transport at nighttime. DPT taxis ensure safety through several measures: all drivers undergo criminal record checks by the authorities, surveillance is mandatory in every taxi, and passengers can share their route through the app for safety reasons.

Modal shift: German T4SM-Member, Bundesverband Taxi und Mietwagen e.V., together h Taxi Deutschland is operating Germany's largest services for pooled mobility in small vehicles in cooperation with the German railway company Deutsche Bahn. Using the taxi fleet to provide ad-hoc

[56] https://www.eiturbanmobility.eu/impact-story/dreamwaves/
[57] https://marketplace.eiturbanmobility.eu/best-practices/girona-how-a-digital-drt-platform-mobilised-former-transport-deserts/
[58] https://marketplace.eiturbanmobility.eu/products/andyamo-a-pedestrian-and-multimodal-route-planner-fully-adapted-to-people-with-reduced-mobility/

mobility solutions to customers of rail when their service is interrupted is supporting the shift from road to rail and embracing the reliability of transport by rail. Taxi helps rail.

Reliability and affordability: In rural areas in Germany, bus lines often do not operate 24/7. But to ensure access to mobility at an affordable cost, a lot of municipalities offer on-demand-devices (phone call or app) operated by taxi companies. The taxis pick you up at the bus stop and follow the same route as the bus service for a small additional cost of 1 euro to a regular bus ticket. These on demand taxi services called Anruf-Sammel-Taxi, Taxibus or Anruf-Linien-Taxi enable public transport to operate 24/7 in rural areas at an affordable price.

In Austria, Anruf-Sammel-Taxi (Call-Shared-Taxi) is a service by CC Taxicenter GmbH in collaboration with the local public transport Linz AG Linien. At a fixed price, it allows customers to book a taxi following a schedule that you share with other passengers. The automatic GPS positioning determines the location, and the customer can then select the preferred departure point. Before you place your order and after the departure time and destination are selected, the AST fare, journey time, and distance are displayed. This service is offered during both day and nighttime.

Inclusion: In Hamburg, Germany, taxi industry is moving towards zero-emission-vehicles while including vulnerable users. Among this large effort, wheelchair-accessible vehicles get a special support. In Hamburg, the taxi industry operates 10 zero emission wheelchair accessible vehicles, more than in any other city in the country. This is of special importance, as the switch to zero emission in some cases contradicts inclusion for reasons of car availability, the weight of the car and the possibility to install ramps and other systems needed to make a car wheelchair accessible. This example shows how taxis can combine clean mobility and social inclusion of vulnerable users.

EIT Urban Mobility educational resources

E-Courses on Urban Mobility: EIT Urban Mobility offers various educational resources aimed at enhancing understanding and implementation of transport solutions that cater to all. Links available on Urban Mobility Courses. Selected e-courses:

- **Urban Mobility: Accessibility for All:** Explores universal design principles and their application in creating inclusive urban environments, offering insights into designing accessible and affordable transport systems.
- **Gender Differences in Urban Transport:** Addresses how gender impacts travel behavior and modal choices, emphasizing the importance of gender-sensitive transport planning.
- **Demand Responsive Transport (DRT):** Discusses the role of DRT in providing flexible and efficient transport solutions, especially for communities outside major urban centers.
- **±15-Minute Cities:** Advocates for urban planning that places essential services within a 15-minute walk or cycle, promoting sustainability and accessibility.

UMX Video Series: A collection of educational videos that shed light on addressing transport poverty through diverse measures. Links available on the Urban Mobility Explained YouTube Channel[59]. Selected videos:

- **How to improve mobility in single-parent families?** This video explores the unique mobility challenges faced by single-parent households and showcases solutions that support their diverse transportation needs.
- **What is Demand Responsive Transport (DRT)?** A clear and concise explanation of how Demand Responsive Transport works and its potential to modernise public transit systems to be more responsive to individual needs.

[59] https://www.youtube.com/@urbanmobilityexplained

- **How can bike design adapt to people's needs?** Showcases innovative bike designs that cater to a variety of user needs, making cycling more accessible and enjoyable for everyone.
- **How did a bike train become a city policy? | Lisbon's Bike Train Programme:** Reports on the transformation of a grassroots cycling initiative into a formal policy in Lisbon, highlighting the power of community involvement in shaping urban mobility.
- **How is the Netherlands using cycling to reduce mobility poverty?** Explores strategies employed by the Netherlands to make cycling a more inclusive mode of transportation, thereby reducing mobility poverty.
- **How can active travel totems promote walking and cycling in Malta?** Demonstrates how Malta is using active travel totems to encourage walking and cycling by providing clear, accessible information on routes and distances.
- **How to make urban cycling more attractive to women?** Addresses the challenges and solutions for making urban cycling more appealing and safer for women, featuring insights from cycling expert Marianne Weinreich.
- **How can free public transport have a positive impact on older adults?** Showcases the benefits of free public transport for older adults, highlighting improved mobility, independence, and social engagement.

List of organisations participating to the subgroup

Subgroup leaders
Ile-de-France Region UITP - International Association of Public Transport
Cities and Regions
Barcelona Metropolitan Area Braga Municipality Budapest Central Slovenia Statistical Region (w. Ljubljana) Oradea Toulouse Métropole
Member States
Belgium Czechia Finland France Italy Latvia Lithuania Luxembourg The Netherlands Poland Portugal
Organisations
ACEA – European Automobile Manufacturers Association AVERE - The European Association For Electromobility Community of European Railway and Infrastructure Companies - CER aisbl Council of European Municipalities and Regions - CEMR Cycling industries Europe aisbl (CIE) EIT Urban Mobility ERTICO European Cyclist Federation asbl (ECF) European Passenger Transport Operators - EPTO European Transport Workers Federation - ETF-Europe Eurocities International Road Transport Union - IRU LEVA-EU MaaS Alliance Micro-Mobility for Europe MOVE EU - The European Association of On-Demand Mobility POLIS Taxis 4 Smart Mobility - T4SM
Observers
CoR – Committee of the Regions JRC – Joint Research Centre of the European Commission
Ad-hoc expertise
EMTA – European Metropolitan Transport Authorities