Interreg CENTRAL EUROPE

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GreenPATH

# D2.1.1 Innovative framework for urban spaces and technologies

Version 1

MM YYYY

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# Executive summary

The GreenPATH project will develop an innovative approach to commuting in Central European Functional Urban Areas (FUAs). The project addresses the challenge of decarbonizing urban mobility through tested solutions, strategies, and action plans. It involves 11 partners, including local administrations, mobility agencies, operators, universities, and research bodies from EU Regions where transport is a major contributor to greenhouse gas emissions.

The project aims at co-designing smart and green solutions in the field of **mobility management**, with the collaboration of public and private stakeholders. Mobility management strategies, measures and practices represent a relevant component of sustainable mobility planning and can generate **impacts** for citizens, companies and territories.

In order to define the conceptual space where these impacts can be maximised, the GreenPATH aims at identifying a common framework, presented through different exemplary (and overlapping) scenarios, to support policymakers, mobility planners and mobility managers to identify and select priority policies and measures to build sound and innovative Sustainable Urban Mobility Plans (SUMPs) mobility management strategies.

The integration of mobility management measures in SUMPs aims in particular at triggering **behavioural change** of residents and employees from individual car use to sustainable modes of transport. Mobility management plans should be integrated into SUMPs to support the overall sustainable urban mobility goals of a city or region, and therefore their elaboration should follow the conceptual framework defined by the four macro-phases of SUMPS (preparation and analysis, strategy development, measure planning, implementation and monitoring), and the eight SUMP principles described in the image below.

How should an **urban environment** be designed, to maximise the impact of mobility-related innovations under different domains (social, economic, legal, infrastructural, technological, environmental) on citizen behaviour? And therefore, under which conditions the innovations developed and tested within the GreenPATH environment are expected to generate the most **benefits for the engaged Functional Urban Areas**?

In order to investigate the factors, and to design a favourable context where mobility management innovations can exploit their potential, three scenarios – each one corresponding to a strongly focused vision for the future of a FUA – have been elaborated. The three scenarios, respectively named **"ACTIVille"**, **"TRANSITopolis"** and **"TECHcommuteCity"**, have been declined according to their main attributes in terms of FUA characteristics, economy and industry, travel demand, transport services, and infrastructure.

**ACTIVille** integrates active mobility and in particular cycling into its urban fabric, economy, and transportation systems through innovative approaches to planning, technologies and infrastructure enabling and supporting active behaviour.

**TRANSITopolis** is a transit-oriented city developing around a network of integrated transit hubs, where seamless mobility, economic vitality, and sustainability are prioritized in the policymaking and mobility planning process.

**TECHcommuteCity** is tailored for commuters, integrating advanced technologies to optimize mobility, enhance quality of life, and drive sustainable growth.

Furthermore, the scenario approach has been used to classify a **range of inspirational good practices**, and will be adopted further in the GreenPATH project as framework for the evaluation of the potential of the GreenPATH solutions and for the delivery of recommendations for policymakers on how to maximise the impact of mobility management measures in FUAs.

The analysis proposed has been enriched with a focus on **incentives for active mobility and commuting**, and with a section on **the role of communication and engagement**, promotional campaigns for a sustainable mobility management in FUAs.

The scenario elements will be taken as reference for future activities connected to the uptake and upscale of solutions, including the development of local action plans, and will contribute to the development of the common **GreenPATH Functional Urban Areas integrated planning strategy** (O.3.1), that will provide guidance for coordinating, planning and implementing Mobility Management innovative actions in CE FUAs.

Furthermore, the innovative framework represents the perimeter for the analysis of the potential impacts of pilots and solutions tested within GreenPATH. The first solution developed will be represented by the **co-designed Mobility Management coordination dashboard**, an ICT based dashboard integrates data on commuting flows and initiatives by companies to allow regional and local administrations (region/area mobility managers) to coordinate Mobility Management actions, promote joint approaches and assess their impact on mobility through tailored KPIs. This will be tested by collecting and jointly analysing data generated by mobility management actions by companies and institutions. The second solution consists in **Mobility Management packages for commuting students and employees**, composed by sets of soft measures (microincentives, gamification, tech platforms) to promote eco-friendly commuting for students and employees. It focuses on new technologies, outlining specific approaches for engaging commuters, and will be tested by engaging commuting students at Maribor, Boku and TU Berlin universities, and commuting employees in Ravenna, Monza, Kecskemét, Osijek.

# 1. Introduction

The GreenPATH project focuses on sustainable mobility within FUAs and tackles commuting challenges through integrated governance of commuter flows and innovative mobility management solutions. The project will utilize new technologies and data-sharing platforms to enhance transport efficiency and improve the commuting experience with real-time information and personalized travel options. Transnational cooperation is key, bringing together expertise from Italy, Germany, Austria, Slovenia, Hungary, and Croatia. This cooperation contributes to overcoming national legislative barriers and creating applicable mobility management tools across the region. GreenPATH aims to deliver formal cooperation agreements, collaborative solutions for sustainable mobility, a comprehensive strategy, and action plans for each FUA. Decision-makers will adopt the project outputs to ensure long-term implementation and cooperation beyond the project's completion, benefiting a wide range of users, including local authorities, service providers, and educational institutions.

The GreenPATH Innovative framework for urban spaces and technologies aims at – through the analysis of mobility innovations enhancing sustainable travel options for commuters – at designing a favourable context where mobility management innovations can exploit their potential.

The framework elaborated in the present report will be considered as reference – in synergy with other project deliverables - for the evaluation of the potential of the GreenPATH solutions and for the delivery of recommendations for policymakers on how to maximise the impact of mobility management measures in FUAs.

# 2. Building the framework

Mobility management strategies, measures and practices represent a relevant component of sustainable mobility planning and can generate **impacts** at different levels:

**Citizens**

- Mobility management good practices can have a decisive impact on citizens' **travel behaviour**. On one side, commuting is directly affected by measures fostering the use of transit, active modes, or a smarter use of private vehicles; on the other, virtuous practices might be extended to leisure and other trips, members of the family, and in some case lead to the replacement of private cars with other options.
- The availability of different mobility options, the presence of planning tools and incentive schemes lead the citizens to **more rational transport choices**, giving the opportunity to identify the most convenient and sustainable travel arrangement for commuting and other purposes.
- The adoption of virtuous mobility practices contributes to a **better quality of life**, from a twofold perspective: on one side, the integration of active modes, transit and shared mobility generates impacts on health, stress and socialisation; on the other, the increase of sustainable mobility share improves the urban environment for all citizens.

**Companies**

- Companies fostering the adoption of virtuous practices by their employees, through the implementation of mobility management measures, contribute to increase the **sustainability** of their business.
- At the same time, mobility management is a useful tool integrating the companies' **welfare** systems, contributing to the improvement of employees' satisfaction.
- The results of these actions will be reflected in the **Corporate Social Responsibility strategies**, affect **ESG targets**, and contribute to the **Sustainability reporting** process.
- Mobility management can also generate **cost savings** for companies, both a) direct (e.g. **savings on parking infrastructure**) and b) indirect, increasing **productivity by reducing employees' stress** and **punctuality by reducing congestion**.

**FUAs and Local Authorities**

For FUAs and Local Authorities, promoting and coordinating mobility management strategies (largely based on the three criteria "avoid", "shift" and "improve") and actions is crucial in order to complement the efforts in:

- Reducing **congestion**: mobility management approaches might lead to a most efficient distribution of traffic flows by improving existing patterns and shifting towards more sustainable travel modes; furthermore, measures falling into the "avoid" category such as smart working and work scheduling actively contribute to the targets;
- Reducing **local and GHG emissions**: mobility management, by improving the efficiency of commuting, contributes by definition to the reduction of emissions through the increase of active, transit and shared modes; moreover, mobility innovations often embed decarbonisation actions (e.g. on fleets) impacting directly the emissions;
- Improve **liveability and attractiveness** of the urban environment: the positive impacts of mobility management on commuting flows contribute to enhance the quality of the urban environment, and therefore the liveability for citizens and attractiveness for new inhabitants, economic activities and tourists.

In order to define the conceptual space where these impacts can be maximised, the GreenPATH aims at identifying a common framework, that will be presented through different exemplary (and overlapping) scenarios, to support policymakers, mobility planners and mobility managers to identify and select priority policies and measures to build sound and innovative Sustainable Urban Mobility Plans (SUMPs) mobility management strategies.

## 2.1. Mobility Mangement and SUMPs

A first step in order to build exemplary scenarios is represented by the understanding of the planning context where mobility management strategies and initiatives can find ideal conditions.

According to the SUMP Topic Guide on mobility management[1], released in May 2023 within the framework of the Civitas Elevate project, as both mobility management and SUMP are both targeting the same overall goal – namely the increased use of sustainable modes of transport – measures associated with the former represent an essential part of any SUMP. Furthermore, as mobility management strongly relies on the development of soft measures, its financial impact is quite limited on the overall planning process and sound sets of coordinated measures can provide good value for money for the cities.

The integration of mobility management measures in SUMPs aims in particular at triggering **behavioural change** of residents and employees from individual car use to sustainable modes of transport.

In synthesis, Mobility management plans should be integrated into SUMPs to support the overall sustainable urban mobility goals of a city or region, and therefore their elaboration should follow the conceptual framework defined by the four macro-phases of SUMPS (preparation and analysis, strategy development, measure planning, implementation and monitoring), and the eight SUMP principles described in the image below.

**The eight SUMP principles**


*Source: SUMP Topic guide on mobility management, 2023*

The topic guide provides also a checklist of recommendations to be taken into account when including mobility management in a SUMP, summarised in the following.

**a) For urban and mobility planners**

- Propose a clear and **long-term vision**;
- Define a clear action and monitoring plan and key performance indicators for the evaluation of mobility management measures;

[1] Topic Guide: Integrating mobility management for public and private organisations into SUMPs, May 2023

- Ensure strong horizontal cooperation within the city administration, working with several relevant departments, such as planning, buildings, environment, etc.;
- Ensure wide public-private cooperation at the master planning stage (with estate developers, construction companies, architects, citizens and residents, etc.);
- Set up mobility centres to offer support for citizens;
- **Steer behaviour** towards sustainable mobility via **parking policies**.

**b) For public authorities**

- Ensure the existence of a **regulatory and guidance framework** that supports sustainable mobility and mobility management;
- Find political will and administrative capacity;
- Seek regional and national support;
- Ensure the public authorities lead and act as a role model;
- Develop **Commuter Master Plans**.

**c) For companies**

- Investigate the **mobility needs of the employees**, with a **focus on big companies**;
- Develop an action plan and set targets based on employees' needs;
- **Involve employees** and ensure support from corporate management;
- Create **incentives to shift** away from individual car use;
- Test new mobility management policies;
- Nominate mobility managers;
- **Educate** employees about the impacts of mobility management;
- Develop a **travel plan**;
- Conduct **awareness campaigns** and offer **reward schemes**;
- Communicate and make it fun!

**d) For education institutions (including universities)**

- **Analyse mobility patterns** of pupils / students / parents / teachers travelling to schools / universities;
- Develop a school / **university Travel plan**;
- Improve public transport routes and active mobility facilities for schools and universities;
- **Educate students on safety and sustainability** in primary but also secondary schools and universities;
- Carry out training, **awareness and behavioural-change activities** within schools and universities, e.g. road safety training sessions

A further set of recommendations is provided in the topic guide for the leisure and tourism sector.

The recommendations exposed above confirm the central role of **demand analysis, engagement, awareness and behavioural change** (with a focus on incentives) aspects when it comes to mobility management

approaches, that need to be integrated into a pattern of innovative factors, measures and policies re-shaping the mobility framework at FUA level.

## 2.2. Innovation factors influencing travel behaviour

After analysing the planning strategic framework where mobility management plans need to be integrated in order to be able to generate a systemic impact, the document focuses on the analysis and selection of those innovative factors in the mobility ecosystem that are expected to influence substantially the travel behaviour of citizens, in particular of commuters.

A recent scientific article (Wolny-Kucińska, A., et Al., 2024) classified the innovation drivers identified in the literature and provide an analysis of their impact on travel behaviour in FUAs through a targeted expert survey across Europe.

Innovative factors were comprehensively identified and classified into six categories (social, economic, legal, infrastructural, technological/SMART and environmental), and ranked according to their potential impact in European OECD countries.

According to the experts, the group of economic factors have the highest impact on the choice of transport modes in FUAs, but the four classification groups included factors from different categories in varying degrees of intensity (from high-impact to irrelevant factors). Therefore, not all factors should still be regarded as innovative.

The following table represents a summary of the factors ranked as high or medium relevant according to the experts (dark grey high, light grey medium).

**Innovation factors influencing travel behaviour**

| Category | Factor |
|---|---|
| Social | Remote work |
| | Less crowded public transport (bus, tram) |
| | Eco-conscious attitude (public transport is chosen for environmental reasons) |
| | Higher travel comfort |
| Economic | Purchase of modern means of transport |
| | Higher service frequency (such as a bus line), changes in public transport timetables |
| | Discounts / special offers for public transport passengers / ticket sharing |
| | Decrease in fuel/electricity prices |
| Legal | Traffic calming in downtown areas |
| | Expansion of areas that are accessible to shared vehicles (cars, bikes, scooters etc.) |
| | Introduction of legislation restricting or banning the use of high-emission vehicles (e.g. diesel) in cities or their parts |
| | Introduction or expansion of paid parking zones in the city |
| Infrastructural | Construction of new roads, road upgrades, bike paths, etc. |
| | Availability of transit hubs and park-and-ride (P&R) facilities |
| Technological/ SMART | Implementation of a system to improve punctuality of public transport |
| | Innovative transport solutions, such as electric vehicles, kick scooters, scooters |
| | Travel planning applications |
| | Efficient traffic management system |
| Environmental | Vehicle solutions for environmental protection (e.g. catalytic converter) |
| | Environmental awareness campaigns and programs |
| | Civil engineering structures and solutions that improve road infrastructure safety |

*Source: Elaborations on Wolny-Kucińska, A., et Al., 2024*

The innovation factors listed in the table have been tested against the main characteristics of the urban mobility scenarios described in the next paragraphs, to identify scenario specific lists supporting the development of mobility ecosystems coherent with the respective visions elaborated.

## 2.3. Designing urban mobility scenarios

How should an urban environment be designed, to maximise the impact of mobility-related innovations under different domains (social, economic, legal, infrastructural, technological, environmental) on citizen behaviour?

And therefore, under which conditions the innovations developed and tested within the GreenPATH environment are expected to generate the most benefits for the engaged Functional Urban Areas?

In order to investigate the factors, and design a favourable context where mobility management innovations can exploit their potential, we present here three scenarios – each one corresponding to a strongly focused vision for the future of a FUA – that will be used to classify a range of inspirational good practices, and that can serve in the future as framework for the evaluation of the potential of the GreenPATH solutions and for the delivery of recommendations for policymakers on how to maximise the impact of mobility management measures in FUAs.

The three scenarios, respectively named "ACTIVille", "TRANSITopolis" and "TECHcommuteCity", are presented here through a summary description of their main attributes in terms of FUA characteristics, economy and industry, travel demand, transport services, and infrastructure.

### 2.3.1. ACTIVille

ACTIVille integrates active mobility and in particular cycling into its urban fabric, economy, and transportation systems through innovative approaches to planning, technologies and infrastructure enabling and supporting active behaviour.

This model city demonstrates how urban environments can leverage cycling to enhance sustainability, economic vitality, and quality of life, supported by data-driven infrastructure and policies.

*Image generated with AI https://www.fotor.com/*

*FUA characteristics*

**Multicentric, limiting urban sprawl**: neighbourhoods are organised around hubs providing integrated services, land use is controlled through restrictive policies privileging requalification and renovations.

**Compact, mixed-use zoning**: neighbourhoods prioritise walkability and short bike commutes to reduce car dependency, supported by e-bike corridors for longer trips.

**Multi-modal integration**: cycling is seamlessly connected to public transit, with bike racks at stations, real-time transit-bike coordination, and policies allowing bikes on trains/buses.

*Economy and industry*

**(Post)industrial transition, innovation, education**: the transition from industrial to tertiary and high-tech vocation, attracting new business initiatives, requires a redesign of urban spaces for new activities and spaces for education.

**Tech-driven mobility sector**: Startups and firms specialize in energy, environment and mobility-based solutions, requiring testing spaces and opportunities (e.g. urban living lab experimental approaches), policy and financial support.

**Local retail and real estate growth:** businesses near bike lanes experience higher revenue due to cyclists' frequent, unplanned stops. Property values rise near bike trails.

*Travel demand*

**High cycling modal share**: a relevant and growing percentage of residents cycle daily, with e-bikes bridging longer distances.

**Off-peak flexibility**: smart work-hour policies and bike-friendly infrastructure reduce rush-hour congestion, spreading demand more evenly but also over a longer time window.

**Tourist influx**: visitors walk and use bike-sharing and other micromobility options, drawn by curated routes linking cultural sites and nature trails.

*Transport services*

**Mobility-as-a-Service (MaaS) integration**: public transit, shared services, parking etc. are integrated through multimodal apps providing customised mobility packages and allowing functionalities as trip planning, booking, ticketing, payment; multimodal and active travel are incentivized, planning tools are designed to prioritize and aid active and vulnerable users' travels.

**Shared and on-demand options**: Dockless e-scooters, bikes, e-bikes and cargo bikes supplement public transit in low-density areas.

**Smart traffic management**: Sensors in bike lanes adjust traffic signals to prioritize cyclists, while AI-powered systems predict and mitigate congestion hotspots

*Infrastructure*

**Protected bike lanes**: lanes separated from traffic, equipped with solar-powered lighting and air-quality sensors enable bike commuting.

**Secure parking**: automated bike parkings at transit hubs with charging ports and anti-theft tracking are installed, and complemented with first repair tools.

**Smart greenways**: recreational trails with Wi-Fi, charging stations, AR navigation for tourists, etc. have been designed.

Building on the analysis of the innovation factors presented in the previous section, a selection has been made on the basis of the designed scenario. The mix of environmental, infrastructural, social, legal and technological measures prioritized – to be considered as catalysis for the successful delivery of innovative solutions fostering active and biking oriented behaviours among commuters, is presented in the following table.

**Innovation factors influencing travel behaviour (scenario specific)**

| Category | Factor |
|---|---|
| Environmental | Environmental awareness campaigns and programs |
| Infrastructural | Efficient traffic management system |
| Infrastructural | Construction of new roads, road upgrades, bike paths, etc. |
| Social | Eco-conscious attitude (public transport is chosen for environmental reasons) |
| Infrastructural | Availability of transit hubs and park-and-ride (P&R) facilities |
| Legal | Traffic calming in downtown areas |
| Legal | Introduction of legislation restricting or banning the use of high-emission vehicles (e.g. diesel) in cities or their parts |
| Legal | Introduction or expansion of paid parking zones in the city |
| Social | Remote work |
| Technological/ SMART | Travel planning applications |

*Source: GreenPATH elaboration on Elaborations on Wolny-Kucińska, A., et Al., 2024*

According to the analysis, key innovation factors for the ACTIVille scenario encompass social and environmental aspects such as environmental awareness campaign and eco-conscious attitude towards

active and in general sustainable mobility options, as well as infrastructural elements including the construction of bike lanes and innovative mixt use roads, but also efficient and vulnerable-user oriented traffic management systems, and intermodal nodes (park&ride, bike&ride, etc.).

Furthermore, it is important to note that also legal aspects, from traffic calming to curb management and emission restrictions, and applications for smart travel planning, have a role in building active mobility-oriented urban environments.

A cross cutting factor for innovation is represented by the introduction of more flexible work options, in particular smart/remote work, able to generate significant changes in commuting patterns.

### 2.3.2. TRANSITopolis

*Image generated with AI https://www.fotor.com/*

TRANSITopolis is a transit-oriented city developing around a network of integrated transit hubs, where seamless mobility, economic vitality, and sustainability are prioritized in the policymaking and mobility planning process.

This model city prioritizes equity, efficiency, and environmental protection, aligning with global smart city frameworks. By balancing commercial viability and public service, it fosters a sustainable urban ecosystem where transit hubs act as engines of economic and social activity.

*FUA characteristics*

**Mixed-use zoning**: transit hubs serve as central nodes with high-density residential, commercial, and recreational spaces within a 15–20 minute walking radius.

**Hierarchical hub structure**: the network is segmented in a) local hubs (small-scale, unimodal for low passenger traffic, e.g. bus stops with bike-sharing), b) municipal hubs (multimodal with medium-high traffic, featuring "Park and Ride" facilities and retail), regional hubs (large terminals integrating high-speed rail, subways, flexible (DRT) and autonomous services, surrounded by transit-oriented development (TOD) areas.

**Green corridors**: Pedestrian and cycling networks connect hubs to parks and residential areas, reducing reliance on private vehicles.

*Economy and industry*

**Job growth**: a relevant share of regional jobs cluster in proximity (max 1 km) of transit stations, driven by light rail and bus rapid transit (BRT) connectivity.

**Innovation clusters**: tech campuses and green industries concentrate near regional hubs, leveraging proximity to transit for talent recruitment.

**Commercial Zones**: retail and office spaces embedded within hubs attract pedestrian and bike traffic and private investments, with part of the hub areas allocated to commerce.

*Travel demand*

**Peak-hour ridership**: Municipal and regional hubs handle large mass transit daily flows; traffic and crowd management systems, AI-driven, collect data for day-by-day optimisation, tactical and strategic planning of services.

**Modal share**: public transit represents the main share (>50%), followed by active modes (walking and cycling), while private mobility is residual (due to congestion charging and limited parking).

*Transport services*

**Mobility-as-a-Service (MaaS) and fare integration**: public transit, shared services, parking etc. are integrated through multimodal apps providing customised mobility packages and allowing functionalities as trip planning, booking, ticketing, payment; universal fare systems enable seamless transfers across buses, trains, and micro-mobility via contactless payments.

**Real-time data**: Sensors and AI adjust service frequency, predict delays, and reroute vehicles dynamically.

**First/last-mile solutions**: innovative solutions such as autonomous shuttles and micromobility bridge the gaps between hubs and peripheral neighbourhoods.

**Demand-Responsive Transit (DRT)**: on-demand transit serves low-density areas and off-peak hours, optimising the use of resources to guarantee accessibility.

*Infrastructure*

**Smart stations**: solar-powered hubs with green roofs, multipurpose charging for public and private EVs, regenerative braking energy systems of rolling stock, energy storage systems (including second life batteries), vehicle-to-grid (V2G) infrastructure and vehicles.

**Multimodal Connectivity**: hubs at different hierarchy levels combine a range of services to guarantee long-medium-short distance and first/last mile connectivity (high speed rail, regional and suburban railways, tram/bus/BRT, sharing and micromobility, DRT and on-demand services, etc).

**Resilient Design**: flood-resistant infrastructure and smart grids ensure continuity of operations and other economic activities by the hubs during extreme weather.

Building on the analysis of the innovation factors presented in the previous section, a selection has been made on the basis of the designed scenario. The mix of economic, environmental, infrastructural, social, technological and legal measures prioritized – to be considered as catalysis for the successful delivery of innovative solutions fostering transit oriented behaviours among commuters, is presented in the following table.

**Innovative factors influencing travel behaviour (scenario specific)**

| Category | Factor |
|---|---|
| Economic | Purchase of modern means of transport |
| Economic | Higher service frequency (such as a bus line), changes in public transport timetables |
| Economic | Discounts / special offers for public transport passengers / ticket sharing |
| Environmental | Environmental awareness campaigns and programs |
| Environmental | Vehicle solutions for environmental protection |
| Infrastructural | Efficient traffic management system |
| Infrastructural | Availability of transit hubs and park-and-ride (P&R) facilities |
| Social | Eco-conscious attitude (public transport is chosen for environmental reasons) |
| Social | Less crowded public transport (bus, tram) |
| Social | Higher travel comfort |
| Technological/ SMART | Implementation of a system to improve punctuality of public transport |
| Infrastructural | Construction of new roads, road upgrades, bike paths, etc. |
| Legal | Traffic calming in downtown areas |
| Legal | Introduction of legislation restricting or banning the use of high-emission vehicles (e.g. diesel) in cities or their parts |
| Legal | Introduction or expansion of paid parking zones in the city |
| Social | Remote work |
| Technological/ SMART | Travel planning applications |

*Source: GreenPATH elaboration on Elaborations on Wolny-Kucińska, A., et Al., 2024*

According to the analysis, key innovation factors for the TRANSITopolis scenario encompass economic (zero emission and modern fleets, service frequency, discounts/incentives), social and environmental aspects (eco-conscious attitude towards active/sustainable mobility options, environmental awareness campaigns,

friendly and more competitive public transit) as well as infrastructural elements (efficient and vulnerable-user oriented traffic management systems, intermodal nodes).

Moreover, legal aspects related to the reduction of emissions and to restrictions to private mobility, and elements of digitalisation such as travel planners and monitoring systems are relevant to the picture.

Also in this scenario, a cross cutting factor for innovation is represented by the introduction of more flexible work options, in particular smart/remote work, able to generate significant changes in commuting patterns.

### 2.3.3. TECHcommuteCity

TECHcommuteCity is tailored for commuters, integrating advanced technologies to optimize mobility, enhance quality of life, and drive sustainable growth.

This model city exemplifies how technology can transform commuting into a seamless, efficient, and sustainable experience while fostering economic resilience and inclusivity.

*Image generated with AI https://www.fotor.com/*

*FUA characteristics*

**Data-driven urban planning**: digital twins simulate traffic patterns, land use, and infrastructure needs to balance residential, commercial, and industrial zones.

**Eco-efficient design**: green corridors, pedestrian-friendly zones, and EV charging hubs reduce emissions and prioritize low-carbon commuting.

**Integrated urban-suburban connectivity**: seamless mobility between the city core and suburbs via IoT-enabled transport networks, real-time traffic management, and synchronized public transit schedules.

*Economy and industry*

**Tech-driven innovation hubs**: data analytics, sensor manufacturing, and urban tech startups drive the economic development, supported by public-private partnerships.

**Job creation**: expansion of high-skilled roles in AI, IoT, and transportation logistics, alongside service-sector jobs in maintenance and customer support for smart systems.

**Tourism and investments**: enhanced accessibility and smart attract businesses and tourists, boosting local economy.

*Travel demand*

**Dynamic commuter needs**: Peak-hour demand is managed via predictive analytics, also through incentives for off-peak travel (e.g., discounted fares).

**Multimodal preferences**: high adoption of shared mobility (e-bikes, e-scooters), ride-pooling, and public transit, is driven by MaaS platforms.

**Real-time adaptability**: Commuters adjust routes using apps providing information on traffic, weather, and transit delays, reducing average commute times.

*Transport services*

**Mobility-as-a-Service (MaaS)**: public transit, shared services, ride-hailing etc. are integrated through multimodal apps providing customised mobility packages and allowing functionalities as trip planning, booking, ticketing, payment.

**Demand-Responsive Transit (DRT) and microtransit**: on-demand transit serves low-density areas and off-peak hours, optimising the use of resources to guarantee accessibility.

**Smart public transit**: autonomous electric buses and trains with Wi-Fi, USB ports, and real-time occupancy tracking.

*Infrastructure*

**Connected roads**: 5G-enabled sensors optimize traffic signals, manage congestion, and support autonomous vehicles.

**Energy-efficient systems and hubs**: intelligent infrastructure charging EVs through different options (including inductive on-road), while smart grids prioritize renewable energy for transport hubs.

**Intelligent logistics networks**: innovative automated systems (including drones) for freight reduce daytime road congestion.

Building on the analysis of the innovation factors presented in the previous section, a selection has been made on the basis of the designed scenario. The mix of economic, environmental, infrastructural, legal, social and technological measures prioritized – to be considered as catalysis for the successful delivery of innovative solutions fostering technology oriented behaviours among commuters, is presented in the following table.

**Innovative factors influencing travel behaviour (scenario specific)**

| Category | Factor |
|---|---|
| Environmental | Environmental awareness campaigns and programs |
| Infrastructural | Efficient traffic management system |
| Legal | Expansion of areas that are accessible to shared vehicles (cars, bikes, scooters etc.) |
| Social | Eco-conscious attitude (public transport is chosen for environmental reasons) |
| Social | Remote work |
| Technological/ SMART | Travel planning applications |
| Technological/ SMART | Innovative transport solutions, such as electric vehicles, kick scooters, scooters |
| Infrastructural | Availability of transit hubs and park-and-ride (P&R) facilities |
| Infrastructural | Construction of new roads, road upgrades, bike paths, etc. |
| Legal | Traffic calming in downtown areas |
| Legal | Introduction of legislation restricting or banning the use of high-emission vehicles (e.g. diesel) in cities or their parts |
| Legal | Introduction or expansion of paid parking zones in the city |
| Technological/ SMART | Implementation of a system to improve punctuality of public transport |

*Source: GreenPATH elaboration on Elaborations on Wolny-Kucińska, A., et Al., 2024*

According to the analysis, key innovation factors for the TECHcommuteCity scenario encompass social and environmental aspects (eco-conscious attitude towards active/sustainable mobility options, environmental awareness campaigns) and obviously technological aspects (travel planning, innovative shared digitalised options in particular. In this scenario more than in the others, the introduction of more flexible work options, in particular smart/remote work, able to generate significant changes in commuting patterns, is central and decisive for the implementation of the vision.

Together with that, legal aspects led by factors enabling the expansion of shared mobility operational areas, and furthermore curb side management, traffic calming, and legislation favouring zero emission vehicles are relevant elements for the implementation.

Additional infrastructural elements of the scenario are represented by the development of transit hubs (connected and hi-tech), and smart linear infrastructure.

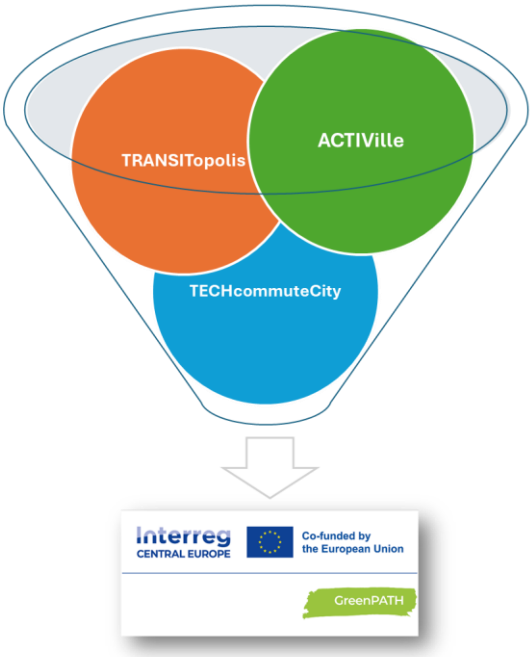
## 2.4. Travel behaviour, urban scenarios and GreenPATH

The designed scenarios, together with the factors and prioritised measures influencing travel behaviour for each of them, represent the reference conceptual framework in which pilot activities and solutions developed by the GreenPATH project will find synergies with urban mobility planning principles, actions and innovative initiatives that can maximise their impact on the FUA environments.

For this reason, the scenario elements will be taken as reference for future activities connected to the uptake and upscale of solutions, including the development of local action plans, and will contribute to the development of the common **GreenPATH Functional Urban Areas integrated planning strategy** (O.3.1), that will provide guidance for coordinating, planning and implementing Mobility Management innovative actions in CE FUAs.

The following images shows the conceptual process through which the main strategic elements of the three scenarios are distilled and tailored around the project main outputs, to define the macrotrends, policy and planning context for their impactful implementation, uptake and upscale within and beyond the project scope and time frame.

**The GreenPATH innovative framework for mobility innovations**




*Source: GreenPATH*

As mentioned, besides defining the context for the development of the GreenPATH strategy, the innovative framework represents the perimeter for the analysis of the potential impacts of pilots (O.2.2) and solutions (O.2.1) tested within GreenPATH.

The first solution developed will be represented by the **co-designed Mobility Management coordination dashboard**, an ICT based dashboard integrates data on commuting flows and initiatives by companies to allow regional and local administrations (region/area mobility managers) to coordinate Mobility Management actions, promote joint approaches and assess their impact on mobility through tailored KPIs. This will be tested by collecting and jointly analysing data generated by mobility management actions by companies and institutions.

The second solution consists in **Mobility Management packages for commuting students and employees**, composed by sets of soft measures (microincentives, gamification, tech platforms) to promote eco-friendly

commuting for students and employees. It focuses on new technologies, outlining specific approaches for engaging commuters, and will be tested by engaging commuting students at Maribor, Boku and TU Berlin universities, and commuting employees in Ravenna, Monza, Kecskemét, Osijek.

# 3. The innovative framework for mobility innovations, scenarios and good practices

This chapters summarises, for each scenario, a range of selected good practices, useful to define better the role and impact of mobility management innovations in supporting the visions proposed in the scenarios.

The idea behind the proposed review is to highlight possible innovative measures – whose effectiveness has already been proven in different contexts – to complement those innovations developed within the project to deliver a strategic approach to mobility management.

## 3.1. ACTIVille - Bike friendly smart city and measures promoting active travel

### 3.1.1. Bike to Work initiative in Faenza (Italy)

The Bike to Work initiative in Faenza started as a "kilometre-based incentive" for employees of private companies to cycle to work[2]. A mobile app is used for tracking, combined with a gamification approach fostering participation. Bikers have been rewarded with a 0,20€ fee per km, up to a maximum of 50€ a month.


On of the main distinctive characteristics of the project is the participatory approach: the co-design process engaged a large number of private and public local stakeholders, supporting the design and fine tuning of the measures.

The initiative, periodically relaunched with new funds, engaged more than 1.200 people in its first edition. More important, the initiative (and the dedicated app) has been taken up over the years both by private companies in the Faenza area, and by other municipalities in the Emilia-Romagna Region. A spin off of the project, named Bike to School, has been launched for the education sector.

Among the notable examples of take up, the local company Tema Sinergie adopted the bike to work approach in a broader mobility management strategy, providing reimbursement for public transport seasonal tickets, launching challenges among employees commuting in sustainable ways, and implementing an e-bike fleet.

From 2025, the experience of the initiative at local level will be the driver of a local strategy promoting the development of sustainable commuting plans among companies in the five municipalities in the area.

https://www.romagnafaentina.it/servizi/mobilita-e-trasporti/bike-to-work

### 3.1.2. Co-creating mobility solutions – Madrid (Spain)

[2] For a further description of bike-to-work and similar initiatives providing incentives for active mobility, see also paragraph 4.2.

Public involvement is crucial for the successful implementation and impact of sustainable mobility activities. With the ECCENTRIC Project, focusing on peripheral areas, the city of Madrid designed and implemented a participatory process to involve children and older people, both in the design and the decision making processes related to mobility policies.

A broad range of e events – including workshops, intergenerational activities, and cycling and walking events – engaged about 700 people, and led to several pilot projects. Three of them are particularly interesting: a) the co-design of Constitución Square to better meet older people's needs, b) the installation of real-time bus information boards at Elderly Community Centres, c) the promotion of measures to increase walking and cycling among school children. The testing area of Constitución Square became more accessible, safer for elderly citizens and friendlier for biking and cycling children, and there has been a substantial reduction (36%) in CO2 emissions in the area.

https://programme2014-20.interreg-central.eu/Content.Node/ECCENTRIC-Mobility-solutions-Madrid.pdf

### 3.1.3. Cycle Friendly Employer (CFE) certification, City of Gdańsk

The Cycle-Friendly Employer (CFE) Certification Framework establishes a European standard for bicycle-friendliness in the European workplace, and is currently being implemented in fifteen countries across Europe, with a total of over 850 employers already certified, collectively representing well over 800.000 employees.

To acknowledge for their efforts, companies receive the 'Cycle Friendly Employer' certificate.

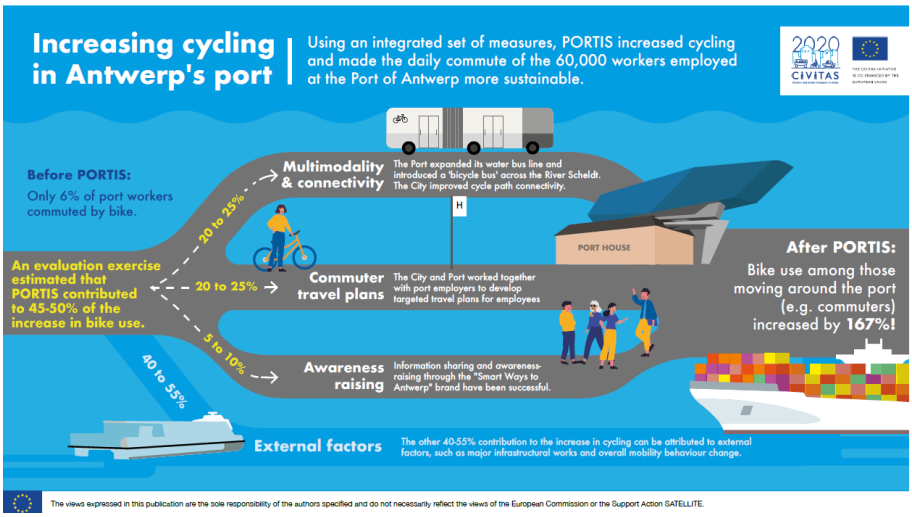
The initiative is based on the experience of the EU project Bike2Work, that developed the CFE standard in 2017. The project had a twofold approach, targeting employees behaviour through dedicated campaigns, and employers encouraging to meet the need of cyclists with dedicated measures.

The certification includes an initial self assessment and a national audit, certifying the measures improving cycling conditions through six action fields: Information, communication and motivation; Coordination, organisation; Services supporting cycling; Facilities for cycling; Parking management as complementary measure; Customer traffic measures (optional). Companies receive a CFE label and certificate valid for 3 years. Each year the company has to submit a self-evaluation report showing that it is at least maintaining good cycling conditions.

Although the certification is usually paid by the companies, during the project the city of Gdańsk sponsored the audit for the top-rated bike-to-work companies, in order to foster the participation to the scheme and the continuous improvement of cycling commuting conditions.

https://cfe-certification.eu/

### 3.1.4. Increasing cycling in Antwerp's port (Belgium)




The city of Antwerp, with this initiative "Smart Ways to Antwerp" (which includes also the development of a MaaS platform and tailor-made approach), developed and implemented a broad range of measures to reduce car traffic in its port area and city centre.

Among these measures, a package was dedicated to company mobility managers in the framework of the CIVITAS PORTIS project, in order to increase cycling in the port areas. The measures implemented ranged from identifying and tackling barriers that stop workers from commuting by bike to working with companies, to develop targeted mobility planning support to their employees. They also include providing employees with trial access to bicycle-sharing schemes and public transport tickets, leading workshops on sustainable working options, and offering employees discount schemes to help incentivise their use of more sustainable modes.

The city and the port of Antwerp also improved multimodality and connectivity, by introducing a ferry service across the River Scheldt, and improving cycle path connectivity. As result, between 2016 and 2019 the number of people moving around the port by bike nearly tripled, and today the modal share of biking within the Antwerp port staff who cycle reached 32%.

https://civitas.eu/projects/portis

### 3.1.5. Multi-ownership Mobility Management Car-free living – District management – Stakeholder management Munich (DE)

The development of the Prinz-Eugen-Park district in Munich with a complex ownership structure aims to provide a sustainable and liveable environment by reducing the utilisation of and need for private motorized transportation. The new district consists of About 1.800 housing units to host about 4.000 residents

The collaboration among a complex ecosystem of stakeholders is at the key of the panning process, also for mobility, including cooperatives, municipal corporations, joint building ventures, developers and building owners.

A mobility concept for the area has been developed with the collaboration of the district management cooperative, municipal institutions, mobility providers, and mobility experts. Mobility has been strongly integrated in the planning of the neighbourhood services, including cargo-bike and e-bike sharing,

integration of mobility services into neighbourhood amenities (e. g. displays with real-time public transit information in shop windows), co-working spaces, a mobility station.

https://www.prinzeugenpark.de/mobilitaet/karten-mobilitaet.html

### 3.1.6. Main takeaways from ACTIVille - Bike friendly smart city and measures promoting active travel good practices

- Public policies as trigger, for bike friendly mobility actions by companies
- Engage and reward citizens embracing active mobility
- Create standards, certify bike-friendly companies
- Consolidate biking as commuting mode
- Co-design solutions with vulnerable groups
- Integrate mobility management planning with infrastructural and multimodal services-oriented measures.
- Plan land use and re-use according to active mobility and bike friendly principles

## 3.2. TRANSITopolis - Transit hubs and measures enhancing public transport and shared mobility

### 3.2.1. Mobility contracts Graz Multimodal living - District management - Stakeholder management (AT)

Mobility contracts are a policy measure implemented by the City of Graz in order to influence modal choices of residents and other stakeholders of new developments. by reducing the legally required amount of parking spaces per housing unit and providing attractive alternatives such as public transport, cycling, walking and shared mobility options.

The contracts guarantee exemptions to the provincial requirement relating to the minimum number of car parking spaces in new residential developments, where conditions and commitments for the implementation of sustainable mobility solutions are met. This generates benefits for developers, in terms of lower construction and maintenance costs, as well as for the city and citizens in terms of impact on traffic and quality of life.

In Mobility Contracts, measures agreed between the city and the developers are organised around nine principles, or packages: number of parking spaces below the official standards, walking, cycling, do not privilege the accessibility for motorized traffic, e-mobility, car-sharing, mobility management, sustainable delivery services. Between 2011 and 2021, City of Graz has signed 35 mobility contracts with developers with interest growing further.

https://urban-mobility-observatory.transport.ec.europa.eu/resources/case-studies/graz-mobility-contracts-sustainable-mobility-new-developments_en

https://www.graz.at/cms/beitrag/10265468/7760054/

### 3.2.2. Sprinti, DRT services integrated in the public transit network, Hannover (DE)


The Sprinti service, active in the Hannover Region, integrates the existing traditional services with the aim of making the overall offer more flexible and efficient, especially in the evening and on holidays. The service is active from morning to late evening.

The service stems from a project developed between the Region and the technological partner and is designed so as not to cannibalize the existing services that are offered as an option to users when available. The service delivers more than 3.000 trips a week, and the average wait is 16 minutes.

A particularly relevant aspect of the solution adopted is the digital integration with traditional public transport services. In fact, the DRT service is displayed both on the dedicated app and on that of the public transport operators of the region (GVH). In this way the solutions are always complementary, and the overlap between the traditional offer and DRT is avoided. Furthermore, Sprinti is fully integrated into the existing tariff system, including the "Deutschlandticket"[3] at national level. From the organizational point of view, Sprinti pursues the enrollment of drivers through full-time and part-time positions, student jobs, and mini-jobs, integrating a high level of flexibility in the supply one of the most critical production factors of public transport services.

https://www.interreg-central.eu/wp-content/uploads/2024/07/D1.1.1_Report-on-DRT-governance-and-planning-in-CE.pdf

https://www.uestra.de/en/timetable/flexible-offers/sprinti/

### 3.2.3. Green Way – Infineon's Mobility Management Programme, Villach (Austria)


50 per cent of employees travel to work with sustainable modes of transport

In 2016 Infineon Technologies Austria AG launched the mobility management initiative "Green Way" in order to promote sustainable mobility as an alternative to the daily trip to work by car.

The analysis of the status quo highlighted a high preponderance in the use of private cars for commuting (76%) due to distance, travel times, but also a perceived lack of good quality alternatives. At the same time, a considerable number of workers declared to be willing to integrate biking in their mobility pattern.

In order to create attractive alternatives to private car commuting, and reduce CO2, the company adopted a strategic and dynamic approach to mobility management based on the institution of a Mobility Management Team, which led to the improvement of public transport connections (2 lines, 15 minute frequency) and provision of incentives to public transport for

[3] For a further description of the "Deutschlandticket", see also paragraph 4.4 as well as paragraph 5.4, where the related promotional campaign is recalled as a best practice of promotional campaigns pivoting on an economic advantage (which directly lowers the financial cost of shifting to sustainable transport options).

employees, creating the conditions for biking (parking facilities, incentives for e-bikes, interactions with the city for the construction of bike lanes), and carpooling (parking spaces, dedicated app), and smart working policies.

Furthermore, the company is very active supporting measures to increase the attractiveness of the city, in order to encourage employees to live in Villach and reduce their home-work distance. The measure implemented brought to a decrease of car trips from 76 to 50%, meaning that 50% of employees commute with sustainable modes.

https://www.infineon.com/dgdl/Infineon-Austria-Villach-Environmental-Statement-2020-EN-web.pdf?fileId=5546d46171bf52ac0172319577bf0041

### 3.2.4. City of Bremen mobil.punkt strategy

Bremen's mobil.punkt strategy is a pioneering model for integrating car sharing into the urban mobility system. By combining regulatory innovation, intermodal connectivity, community engagement, and environmental standards, the city is successfully reducing car dependency and improving urban quality of life. The project aims at reducing parking pressure and car ownership in dense urban neighbourhoods improving the integration across sustainable transport modes and enhancing the air quality, use of public spaces and sustainable urban development. "mobil.punkte" are designated stations in public street areas that bring together car sharing, public transport, bicycles, and taxis, enabling intermodality. Stations are strategically placed near public transport stops, bicycle stands, and taxi ranks to maximize convenience and visibility. Site selection considers accessibility, safety, and integration with urban planning. The city coordinates with transport operators, car sharing providers, police, and citizen groups for planning and operation of mobility services.

https://www.interregnorthsea.eu/sites/default/files/2024-10/City%20of%20Bremen.pdf

### 3.2.5. Adapting the parking policy outside MTHs, the case of Geneva

Geneva's parking policies are designed to manage space and encourage efficient use of parking resources. They involve a combination of zones, parking badges, and various parking facilities, including both surface lots and underground garages.

As part of Geneva's unified parking policy, the pricing of park-and-ride facilities was devised to discourage local use. Parking facilities are accessible to registered commuters and to visitors on an hourly basis. Registration is valid for a single park-and-ride facility. It is open to people who live and work more than two kilometres away and have no public transport facilities nearby. Another condition is that the carpark must be on the simplest route between the home and workplace. In addition to its parking offer for cars, the Fondation des parkings has set up a service to combine car and bike rides. With the "P+B" (park & bike) offer, cyclists may safely leave their bikes in a park-and-ride facility. The eligibility requirements for this service are the same as for the park-and-ride scheme.

https://www.geneve-parking.ch/fr

### 3.2.6. Day care facilities in Multimodal Transport Hubs: the case of Parisian train stations, Paris (France)

The Gares & Connexions project started the set up of day care facilities in train stations, to offer commuters day care near their homes or on their way to work. The first train station to welcome a small-scale day care facility was in Roanne near Lyon, in 2010. Paris-Nord train station hosts a day care centre in an unoccupied SNCF building. Nother day care in Paris is located in Gare Saint-Lazare. In both cases, families pay the same fee as in municipal day care facilities.

In the suburbs of the city, since 2022 daycare facilities were opened at train stations in Seine-et-Marne, Argenteuil, Bondy, Villiers-Neauphle-Pontchartrain and Dammartin-Juilly-Saint-Mard. The Stations of Tomorrow programme aims to revitalize some 100 commuter stations that serve up to 1.500 passengers a day, by filling unused space with local services that benefit everyone. The Micro-Care programme, funded 75% by Île-de-France Mobilités and 25% by SNCF Gares & Connexions, planned to open around 10 daycare centres throughout the Paris suburbs by 2024.

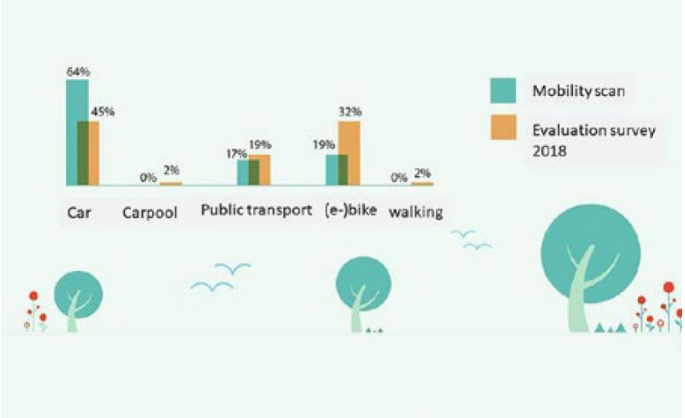
https://www.groupe-sncf.com/en/group/about-us/companies/sncf-gares-et-connexions/childcare-in-stations

### 3.2.7. Main takeaways from TRANSITopolis - Transit hubs and measures enhancing public transport and shared mobility good practices

- Create framework conditions and incentives for the development of sustainable mobility-based and car-free neighbourhoods
- Integrate flexible and inclusive services in public transport networks
- Build attractive alternatives for commuters, improving the quality of life of employees
- Integrate public transport and shared services, engaging citizens in co-design of sustainable options
- Promote intermodality and rational choices, limit private mobility for those who don't have viable alternatives
- Include in mobility management different aspects of daily life, including child care

# TECHcommuteCity - Tech based solutions tailored to commuter categories

## 3.2.8. Smart Ways to Antwerp - an employers' approach, Antwerp (Belgium)

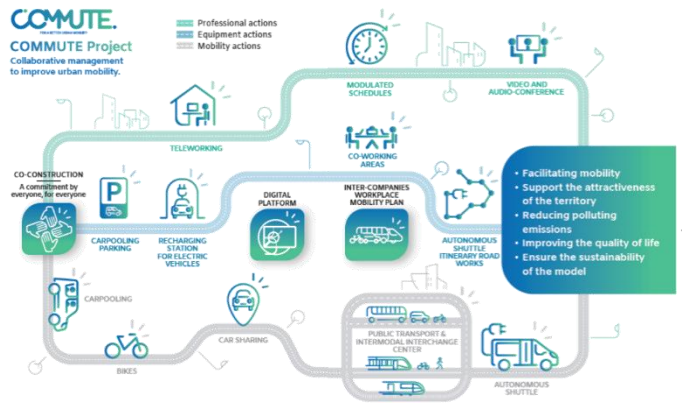



Under the "Smart Ways to Antwerp" are grouped different measures supporting the mobility transition, started within the framework of the CIVITAS PORTIS project. One of the most important, providing context and guidance to other implementations, is the development of a multimodal planner whose algorithm has been designed to prioritise sustainable mobility options, at the basis of a MaaS approach tailor-made to the needs of the city and its commuters. Within this framework, new projects and measures are launched in order to develop solutions enhancing the quality and sustainability of the mobility environment.

Among all the actions, the "Smart Ways to Antwerp" initiative supports companies with more than 20 employees in Antwerp to develop a smart and sustainable mobility policy for their employees. This programme focuses on commuter transport and contributes to the overall goal of the Antwerp region to achieve a modal split of 50/50 for the employees of the participating companies (e.g. a minimum of 50% of all commutes by sustainable modes of transport and only half (maximum) by private car) and long-term behavioural change.

The support to companies include a mobility scan for the identification of the sustainability potential, and periodical evaluation survey to monitor the impact of the proposed measures overt time.

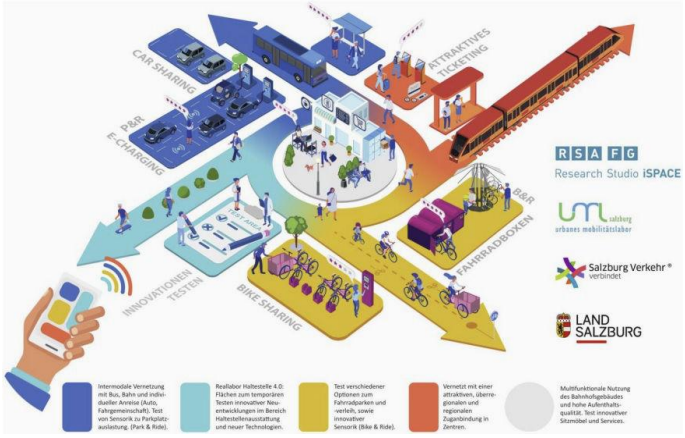
## 3.2.9. The COMMUTE project - inter-company workplace travel plan and carpooling schemes, Toulouse (France)




In the city of Toulouse, the COMMUTE (Collaborative Management Model of Urban Mobility) project, funded under the Urban Innovative Actions (UIA) initiative, public-private a Collaborative Management Model of Urban Mobility has been built with the support of private companies representing around 30.000 employees.

One of the notable results of the project is the development of an inter-company workplace travel plan. This allowed to plan and implement integrated measures and actions supporting active modes (safety measures, e-bike infrastructure and fleets, bike sharing, improvement of bicycle parking with funding for secure premises, financial support), carpooling including financial support to users, innovation I n public transport. The vision is supported by the development of a digital platform dedicated to urban mobility measuring the impacts of the implemented experimentations and that would also be a decision-making tool for the mobility players on the basis of real-time data.

### 3.2.10. UML Haltestelle 4.0 Mobility Hub in Neumarkt am Wallersee (Austria)




The Stop 4.0 is a digitalized mobility node – i.e. physical infrastructure equipped with smart sensors – which was built as a multimodal transport hub or test laboratory for planning purposes in a region characterized by commuting and tourism.

It is a multimodal transport hub: located at a rail feeder hub for long-distance traffic, complemented by various forms of mobility as attractive alternatives to private cars. Furthermore, the 4.0 stop is a future laboratory where innovative new developments and technical solutions are tested under real-world conditions and digital data is provided for research and development. The 4.0 stop collects and analyzes a wealth of data to determine how mobility can be better consolidated toward continuous route chains and how commuters can be transported to their destinations in a more environmentally friendly way. As a testing ground for startups, it aims to quickly bring innovative concepts and solutions to market.

The model is equipped with sensors monitoring park-and-ride occupancy rates, bike parking systems and digital features enabling intermodality, in particular between bike and rail.

### 3.2.11. Hvv switch, Hamburg (Germany)

Hvv switch points combine the public transport offer with alternative mobility offers. There are 217 hvv switch points throughout Hamburg, integrated with car sharing services (Free2move, SIXT share, MILES, and Cambio), shuttle services (MOIA), and e-scooters (Voi). The hvv switch brand is a sub brand of the main Hamburger Verkehrsverbund brand (HVV – the public transport authority A), which is the umbrella organisation for all public transport in the Greater Hamburg region. Since June 2021, the hvv switch app allows users to book, use and pay for shared mobility options and provides information on the availability of parking/shared cars at hvv switch stations. hvv switch bundles Hamburg's mobility services in one app: services are accessible directly to the app without registrations at single providers. Withing this framework, shuttle service provider MOIA is experimenting the integration of autonomous shuttles in their fleet, through the ALIKE project. HOLON vehicles will begin initial test drives in Hamburg in during 2025, initially with a safety driver. The fully accessible vehicles can accommodate up to 15 passengers. Overall, up to 20 autonomous vehicles from both operators are expected to be deployed during the project period, available for booking via the hvv switch and MOIA apps.

### 3.2.12. Main takeaways from TECHcommuteCity - Tech based solutions tailored to commuter categories good practices

- A MaaS “community” approach can support the elaboration of integrated measures for commuters, providing a common framework for data analysis and development of solutions

- An inter-company dimension can be valuable for the development of viable mobility plans addressing common needs
- Physical and virtual spaces and adaptive policy frameworks are fundamental for testing innovations, commuters can experiment different solutions
- The integration between public transport and flexible/shared mobility services is a pre-requirement to foster sustainable innovations affecting behavioural change

# 4. Focus: incentives for active mobility and commuting

In this chapter, the specific theme of incentives for active and sustainable mobility (esp. commuting) is focused on. To this end, after a first introduction outlining key aspects and rationale for promoting active mobility, a review of existing best practices at the European level is presented. Then, the specific potential and effectiveness of (micro) incentives are highlighted and in the last paragraph, a widened perspective is provided by hinting at a more holistic approach towards Maas (Mobility as a Service).

## 4.1. Focusing on active modes

Active modes of transport refer to means of travel that rely primarily on human physical effort, such as walking and cycling. Being based on muscular propulsion rather than an (internal combustion) engine, they clearly belong to the wider category of sustainable transport solutions. Given the increasing emphasis on green goals and reducing the environmental impact of transportation, the importance of shifting towards more sustainable approaches may seem obvious and self-evident today. Among other sources, a recent study[4] found that an average individual shifting from car use to cycling reduces life cycle $CO_2$ emissions by 3.2 kilogrammes per day. Further benefits include reductions in air pollution and noise emissions.

However, when addressing active transportation modes, it is also crucial to highlight additional considerations related to health and well-being.

### 4.1.1. Why it is important to foster active modes also for well-being and health

In fact, as sedentary lifestyles and related health challenges become increasingly prevalent, promoting active modes of transport is not only a matter of environmental sustainability but also a critical public health measure. In this regard, it must be recalled that physical inactivity is a major risk factor for non-communicable diseases (NCDs) such as cardiovascular disease, type 2 diabetes, certain cancers, and obesity. For instance, physical inactivity is estimated to cause around one million deaths annually in the WHO European Region[5], placing a significant burden on healthcare systems[6].

In this regard, regular moderate-intensity physical activity — such as walking or cycling — can reduce the risk of these chronic diseases and is associated with lower all-cause mortality rates. In this regard, different

[4] Christian, B. et al., "The climate change mitigation effects of daily active travel in cities," Current Opinion in Environmental Sustainability, vol. 48, pp. 123-132, 2021, https://doi.org/10.1016/j.cosust.2021.04.002

[5] The WHO European Region is one of six official regions defined by the World Health Organization. It encompasses 53 countries across Europe, Central Asia—particularly territories formerly part of the Soviet Union—and parts of Western Asia, including Turkey and the Caucasus.

[6] See https://www.who.int/europe/activities/promoting-healthy-active-mobility and https://urban-mobility-observatory.transport.ec.europa.eu/news-events/news/who-promotes-active-mobility-healthier-greener-european-cities-2024-11-11_en?prefLang=fi.

studies have shown that increasing the share of cycling and walking trips could prevent relevant amounts of premature deaths each year, depending on the city and the scale of mode shift[7].

More in general active mobility also has positive effects on mental health, thus contributing to reduced rates of depression and anxiety, improved mood, and enhanced overall well-being[8].

These positive outcomes can be facilitated by making walking and cycling a routine part of daily life (as in the case of commuting). In this regard, it is also to highlight a key advantage of active mobility that, unlike organized sports or gym memberships, makes it easier for people of all ages and backgrounds to increase their physical activity levels (also considering that lack of time is often mentioned as a barrier to exercise).

### 4.1.2. The current state of play

Despite increasing recognition of the benefits of active mobility, progress in walking and cycling remains uneven across Europe. For instance, as regards to cycling, Southern European countries typically lag behind Northern and Western European nations. For example, while countries like the Netherlands, Denmark, and Belgium report cycling modal shares exceeding 20-30% in urban trips, Italy's cycling share remains below 5%, and walking rates have also seen limited growth in recent years[9].

This regional disparity is influenced by factors such as urban design that favours car use, insufficient cycling infrastructure, and cultural habits less oriented towards active travel.

Taking into account all these advantages as well as the current state of play, the integration of health considerations into transport and urban planning is essential and is increasingly reflected in holistic approaches such as those promoted by Sustainable Urban Mobility Plans (SUMPs). Moreover, several key initiatives complement these efforts by bridging high-level strategy with regional and local realities. For example, the Polis Network's Working Group on Active Travel and Health fosters knowledge exchange and best practices among European cities to promote active mobility. Furthermore, the World Health Organization's Transport, Health and Environment Pan-European Programme (THE PEP) supports the Partnership on Active Mobility, linking policy frameworks with on-the-ground implementation. Additionally, other platforms as the Transport Decarbonisation Alliance's Community of Interest on Active Travel and the Driving Urban Transitions (DUT) initiative are fostering the shift towards healthier, low-carbon urban transport systems. Together, these initiatives testify to the growing awareness and commitment to integrated, health-focused transport planning for sustainable urban development.

## 4.2. Examples of best practices on incentives for active commuting/mobility

In order to promote active mobility in commuting different approaches and best practices can be ascertained throughout different European contexts.

In general, they can (jointly) leverage on two main aspects:

- ECONOMIC ADVANTAGES, which are particularly relevant, especially in recurrent travels (as in the case of commuting), and therefore can represent a remarkable comparative advantage with respect to the car-free travel options.
- RAISING AWARENESS, which, as also described more in detail in the following chapter regarding communication campaigns, is a key driver for the modal shift to be pursued by reaching different

[7] Mueller et al., "Premature mortality of 2050 high bike use scenarios in 17 countries," Environmental Health Perspectives, vol. 129, no. 12, 2021, https://doi.org/10.1289/EHP9073.

[8] https://www.polisnetwork.eu/wp-content/uploads/2019/06/polis-paper-securing-the-health-benefits-of-active-travel-in-europe.pdf

[9] Eurobarometer survey (2019), https://europa.eu/eurobarometer/surveys/detail/2226

targets of users making use of ICT and more traditional means of information provisions and engagement (e.g. events).

More specifically, different kinds of incentives, addressing different facets and specific aspects ranging from testing and acquiring bikes to fostering their actual usage for commuting have been proposed and tested. Nonetheless, while focusing on specific aspects and levers, it is important to recall how the effectiveness of the incentives is strictly related to the "auxiliary" activities, esp. mobility management, and ICT tools (e.g. an app for information provision to users as well as for registering the gained credits).

In order to briefly review specific best practices it is possible to cluster them as reported in the following.:

**TESTING THE USAGE OF (E-)BIKES**

A first typology of measure for incentivising is represented by promoting their usage inviting residents and commuters to test their usage through in particular the usage of (e-)bikes. This approach is showcased by the "Testkaravaan"[10] itinerant campaign in West Flanders (Belgium) to local communities and involved companies (which can register for free) encouraging behavioural change and reducing car dependency through hands-on experience during a two-week testing.

Anyway, various other campaigns using a similar approach have been carried out across Europe.

Still in Belgium, and more specifically in the Brussels Capital Region, within "The Bike Project"[11] companies (with more than 100 employees and that are required to have a Company Mobility Plan) receive a fleet of test bikes for two or three weeks, along with training, personalized itineraries, and awareness-raising workshops.

Furthermore, similar approaches have been adopted when targeting a wider scope of people (not only commuters). For instance, in Switzerland, an extensive campaign named Bike4Car (carried out between 2010 and 2017) offered car owners a free two-week e-bike trial in exchange for handing over their car keys. The 2015 edition of the campaign was particularly significant: it ran from May to September across 32 Swiss cities and involved 1,854 participants. The campaign was supported by a strong national marketing effort including TV, internet, posters, and advertising at petrol stations, resulting in over 100,000 visits to the campaign website and extensive media coverage. Surveys conducted before, immediately after, and one year following the trial revealed promising behavioural changes since participants showed an increased willingness to use e-bikes for various trip purposes such as commuting after the trial. Additionally, after the trial, participants were offered purchase coupons with discounts (up to 500 CHF, corresponding at that time to about 450 Euros) to encourage continued e-bike use. Hence, as testified by dedicated ex-post analyses[12], the campaign demonstrated that hands-on experience with e-bikes can effectively disrupt car-use habits and promote more sustainable mobility patterns.

**PURCHASING THE BIKES**

Another important lever to foster the usage of (e-)bikes is providing economic incentives for their acquisition. This approach can also be implemented as a follow-up to trial campaigns (as in the case of Bike4Car). In general, it plays a pivotal role in many national and local programmes dedicated to encouraging sustainable mobility by lowering the financial barriers associated with purchasing bicycles and e-bikes. Economic incentives are designed to make these vehicles more accessible to a wider population, particularly as the upfront cost of e-bikes can be prohibitive for many, especially those in lower-income brackets.

[10] See also Kies jouw campagne! | Testkaravaan.

[11] https://thebikeproject.brussels/ and more specifically https://thebikeproject.brussels/coordinateur-trice-mobilite/#testdevelos.

[12] https://digitalcollection.zhaw.ch/items/fd2929bc-a7ab-4722-9745-0c1a0b7267ed and https://irf.fhnw.ch/server/api/core/bitstreams/50dbd34c-1f5d-4ce6-9828-3da0d2f367ba/content

The Netherlands' FIETSPLAN, for instance, is a long-standing initiative that enables employees to acquire bicycles, including e-bikes, through their employer with significant tax benefits (for both the employer and the employee). The cost of the bike is deducted from the employee's gross salary, making it a financially attractive option and encouraging cycling as a regular means of commuting.

Similarly, the United Kingdom's Cycle to Work Scheme allows employees of participating companies to save up to 42% on the cost of a new bicycle and related accessories. The scheme works through a salary sacrifice arrangement, meaning that employees do not pay anything upfront; instead, the cost of the bike and accessories is deducted from their gross salary over a 12-month period.

France's Forfait Mobilité Durable, introduced as part of broader sustainable mobility strategies, enables employers to provide employees with an annual tax-free allowance to cover expenses related to sustainable transport, including the use or purchase of bicycles and e-bikes. This measure encourages eco-friendly commuting habits and low-emission commuting more affordable.

In Italy, while previously (2020) a national incentive scheme was issued to cover up to 60% of the cost (though to cities with more than 50,000 inhabitants), currently different schemes are applied on a regional or local basis. These incentives are often time-limited and region-specific, requiring residents to apply through dedicated platforms. In particular, several regions offer incentives for the purchase of e-bikes, with contributions of up to 50% of the cost (maximum €500) for citizens within a determined range of income. Moreover, other specific provisions could be applied. For instance, in the case of Emilia-Romagna, additional bonuses (e.g. + €400 for scrapping a car) and priority for residents in specific areas are envisaged.

In general, these incentive programmes, carried out in different countries, share key features such as reducing upfront costs, and integrating with employer-led initiatives. Moreover, they can complement and follow-up initiatives such as experiential testing in promoting (e-)bike adoption. In fact, by lowering financial barriers, they reinforce behavioural changes initiated through practical trials and accelerate the transition toward sustainable urban mobility.

**DAILY COMMUTING**

Another effective approach to incentivise daily cycling for commuting is through mileage allowances, which provide employees with a direct financial reward based on the actual distance they cycle to work. This approach encourages regular bike commuting by directly linking the benefit to everyday behaviour rather than a one-time purchase.

For instance, in Belgium, the national initiative "Vélo au travail"[13] offers employees a tax-free reimbursement. The amount of the bicycle mileage allowance is determined by the relevant sector or funding authority and may include conditions such as maximum reimbursable kilometres per workday, minimum bicycle usage, or safety equipment requirements. In the absence of sector-specific agreements, the statutory minimum rate for 2025 is set at €0.29 per kilometre, with a daily cap of 40 kilometres. Nonetheless, employers may provide higher allowances within company policies or employment contracts. The allowance is generally exempt from income tax and social security contributions up to a limit of €0.36 per kilometre and an annual maximum of €3,610 for commuting trips by bicycle.

Similarly, in France, the "Indemnité Kilométrique Vélo" (IKV) is a tax-exempt mileage allowance paid by employers to employees who cycle all or part of their commute, covering both outbound and return trips[14].

[13] See also https://www.ucm.be/actualites/velo-au-travail-quelle-indemnite-pour-le-travailleur-en-2025#:~:text=%C3%80%20d%C3%A9faut%20d'une%20indemnit%C3%A9,kilom%C3%A8tres%20par%20jour%20de%20travail

[14] See also https://www.provelo.org/indemnite-kilometrique-velo-pour-les-employes/#:~:text=Il%20s'agit%20d'une,les%20trajets%20aller%20et%20retour

The allowance is set at €0.25 per kilometre (up to a maximum of €500 per year per employee in the private sector, and €200 in the public sector). Employers may choose to pay higher amounts, though recalling the maximum tax-exempt limit for employer reimbursements of €0.36 per kilometre.

From the employer's perspective, the IKV represents a voluntary expense but benefits from partial public funding support through social security exemptions and tax advantages. Specifically, the allowance is exempt from employer social security contributions up to the stated ceilings, reducing the overall cost burden for companies.

Overall, the IKV is part of France's broader Forfait Mobilités Durables policy, which supports sustainable commuting by providing financial incentives to both employees and employers to reduce car use and promote active mobility modes such as cycling.

In various Italian contexts, innovative kilometer-based reimbursement schemes to promote cycling have been introduced recently. In general, they are based on an app for registering the actual travelled km. This typology of tools is also applicable to gamification initiatives described in the next paragraph.

For instance, as regards to Emilia-Romagna, it is to highlight the "Bike to Work" initiative 2024-2026[15], which is a regional program designed to promote cycling as a primary mode of commuting for employees. The scheme offers a financial incentive of €0.20 per kilometre for home-to-work journeys by bicycle, up to a maximum of €50 per month per person, managed through a dedicated app that tracks distances. Municipalities with a population of over 30,000 residents are eligible to apply as primary beneficiaries, while smaller municipalities can participate by forming partnerships with larger ones. The programme is co-financed by the Emilia-Romagna Region and local governments, targeting employees of private companies, public bodies, and educational institutions that adopt mobility management agreements. Examples of eligible cities include Bologna, Modena, Parma, Ravenna, Ferrara, Rimini, and Forlì. In addition to incentives for the travelled km, the initiative supports other synergic measures (such as reduced bike-sharing costs, subsidized bicycle storage, and infrastructure upgrades like new bike lanes and parking facilities).

In Florence, instead, the "Pedala, Firenze ti premia" initiative[16] (active from June 3, 2024, to June 2, 2025) provides €0.20/km for commuters who switch from motorized vehicles to bikes for home-work or home-school routes, and €0.15/km for existing cyclists, with a €30 monthly maximum. Participants use a "Pin Bike" kit (a Bluetooth device and app) to track rides, and top performers earn additional bonuses of up to €100/month. The project, funded with €1.2 million, has already seen 677,000 km cycled in its first four months by over 2,300 active users.

The "MUVT in Bici" project in Bari offers €0.20/km for home-to-work trips and €0.04/km for other urban journeys, with a €25 monthly cap, supported by GPS tracking devices[17].

**GAMIFICATION & AWARDS**

In recent times, gamification has more and more emerged as an effective approach to encourage active and sustainable mobility. Hence, by integrating game-like elements into mobility initiatives, cities and organizations can stimulate individuals to adopt healthier and more environmentally friendly transportation habits.

They are usually based on ICT platforms that serve as effective motivational tools as well as for checking the actual results thus ensuring the fairness of the competitive approach implicit In the gamification. Moreover, at a more general level, related data can be useful for supporting more targeted and effective urban planning.

[15] See also https: https://mobilita.regione.emilia-romagna.it/leggi-atti-bandi/bandi/biketowork2024-2026.

[16] See also https://www.comune.fi.it/dalle-redazioni/pedala-firenze-ti-premia#:~:text=Il%20progetto%20vuole%20promuovere%20il,giugno%2C%20Giornata%20mondiale%20della%20bicicletta.

[17] See also www.comune.bari.it/web/trasporti-e-viabilita/muvt-in-bici. It is temporarily suspended from 1 February 2025 in view of a new tender for the related ICT platform.

Furthermore, the success of gamification initiatives often depends on outreach efforts and the support of local authorities, which can help expand user communities and ensure legal compliance.

More specifically, it is worth mentioning different experiences carried out in various European contexts showcasing the following key elements:

- Mobile Applications and Tracking Platforms: Apps such as CICLOGREEN[18] and BELLAMOSSA[19] leverage gamification by tracking sustainable transport activities of the users (walking, cycling, or using public transit) and rewarding them with points, rankings, and tangible incentives like gifts, discounts, or local business vouchers. These platforms often include automatic detection of transport modes, challenges, and leaderboards to foster ongoing engagement and competition among users.
- Competitions and Awards: Initiatives like the Cycling Friendly Employer certification in the UK and the Walking Award Competitions in Austria use structured contests to incentivize active mobility. For example, the Austrian Walking Award[20], implemented in cities like Baden and Mödling, invited municipal employees to count their steps over a four-week period, with those reaching at least 60,000 steps eligible for prize draws. These campaigns are often complemented by educational actions, such as expert lectures on health benefits and mobility quizzes, to raise awareness and promote participation. Another relevant example is represented by "STADTRADELN"[21] a national German campaign promoting cycling for everyday trips over 21 days to reduce $CO_2$ emissions and improve urban life. Participants join teams (such as schools, companies, or friends) and log their cycling kilometres via an app or website. The campaign encourages sustainable mobility, health, and community spirit through friendly competition. Moreover, sponsors offer exclusive prizes such as custom cycling bags for top performers.

- Community Challenges and Real-World Rewards: The MUV (Mobility Urban Values) project[22], piloted in cities including Helsinki, exemplifies the integration of gamification with urban mobility planning. Residents use a mobile game to log sustainable trips, earn points, and participate in challenges. Points can be exchanged for real-world rewards -such as free admission to local amenities (e.g., saunas in Helsinki) - and cities compete in inter-city tournaments for sustainable mobility trophies. The project also collects anonymized mobility data to inform traffic planning and infrastructure development.

[18] See also: https://www.ciclogreen.com/

[19] See also: https://www.interregeurope.eu/good-practices/bella-mossa-a-gamification-process-to-promote-sustainable-mobility and https://www.cittametropolitana.bo.it/portale/Archivio_news/Bella_Mossa_chi_si_muove_bene_si_premia

[20] See also https://programme2014-20.interreg-central.eu/Content.Node/MOVECIT.html

[21] See also https://www.stadtradeln.de/en/home

[22] See also https://programme2014-20.interreg-central.eu/Content.Node/MOVECIT.html

## 4.3. Micro-incentives: how do they work

With particular reference to the provision of economic advantages fostering the usage of sustainable transport options, an obvious bottleneck can be represented by budgetary constraints, especially by the public administrations and authorities that are in charge of transport planning and management.

In order to tackle these criticalities, two possible innovative approaches can be pursued. The former is meant to maximise the efficacy and (positive) impact of the (limited) available resources by leveraging on appropriate targeting of (micro)incentives, the latter aims at involving other actors, whose collaboration could range from facilitating reaching out and involving specific basin of users (as typically made through mobility management in a given workplace, school or university) to the actual contribution with own resources.

### 4.3.1. An innovative approach maximising the effects when sources are limited

Microincentives (also referred to microsubsidies) are "tailor-made reward schemes, either monetary or in-kind, designed based on flexible and dynamic criteria to maximise the impact of subsidies in achieving financial and societal goals"[23]. They represent a flexible and adaptable approach to promote specific transport modes at particular times, days, routes, or for designated user categories.

Unlike traditional subsidies, microincentives are:

- "not purely financial but can offer alternative motivations beyond monetary subsidies";
- "envisioned to be highly granular, allowing for near-individualised incentives, and can be adapted to users' particular needs and desires."

A clear example of this can be outlined with reference to the case of public transport when comparing the possible effect of a generalised lowering of fares in contrast to a more targeted incentive aimed at stimulating those who are likely to shift from car usage to public transport. Nonetheless, this general concept, essentially of pivoting on specific incentives likely to sort out relevant effects and unlock desirable behavioural changes, can be applied also in broader terms.

On the other hand, in practice, things can become more complex and the implementation approach should imply a process to be carried out pragmatically by looking at different aspects, also taking into account:

- Simplicity: for example, simplicity is to be valued as a key element in the design of the fare structure or a broader set of incentives;
- Fairness: also recalling that mobility is a sensitive issue from a social standpoint, equity considerations are key and need to be duly taken into account considering different viewpoints.

### 4.3.2. Hinting at possible schemes (e.g. business partnerships)

The incentives are generally established and managed by public bodies or authorities, ranging from the national to the local level. Nonetheless, a growing deal is paid to business partnerships, which can play a pivotal role in designing, financing, and delivering incentive-based programmes (esp. microincentives) that encourage behavioural change and reduce car dependency.

In fact, private companies, in particular those with large workforces, are increasingly co-financing these incentives, either as part of their corporate mobility management plans or as a means to enhance their ESG (Environmental, Social, Governance) certifications and rating. These firms may offer employees subsidized

[23] See Miquel Nadal, Josep Laborda, and Pietro Podestà, Microincentives for Sustainable Mobility in Europe (Barcelona: FACTUAL Consulting, 2024), supported by EIT Urban Mobility et al., https://fairtiq.com/hubfs/Microincentives-Study.pdf.

transit passes, bonuses for active commuting, or even direct financial rewards for reducing single-occupancy car trips. This option can be effectively pursued especially if merging private and public funding.

In some cases, tax incentives and regulatory benefits can stimulate the involvement of private actors. In practice, companies that invest in employee mobility programs can be benefitted (and, therefore, stimulated) through tax deductions or credits.

## 4.4. Widening the picture

As described in the previous paragraphs, in order to foster active and more sustainable mobility, different themes can be addressed and various tools can be identified and leveraged. Moreover, looking at the wider perspective of sustainable transport it is important to consider the synergic aspect of promoting the usage of public transport.

PT (fares)

In this regard, different examples are provided starting from generalised favourable fares and tickets. In particular, this encompasses initiatives carried out at the national level providing discounted (or even free) tickets.

An option is to reduce drastically public transport fares, or even implement a full-fledged free public transport policy. For instance, this approach has been tested in Luxembourg, where a free ticket has been introduced starting from the year 2020. A slightly different situation is represented in the case of highly convenient travel passes (allowing the use of public transport across an entire country or region), as in the case of the “Deutschlandticket”, which currently (2025) has a cost of 58€. A similar approach is present in the Austrian “Klimaticket” with a duration of one year and a cost equal to about €3 per day.

However, in general, the effectiveness of these policies has been questioned and they depend largely on the possibility for the public administration of bearing the related financial burden as well as on the initial national/local context and the accompanying measures put in place.

Moreover, different Countries are looking at and implementing commuting allowance programmes (e.g. Belgium, France and The Netherlands), where governments and businesses aim to incentivise sustainable transport (including PT) through corporate mobility schemes. This includes solutions such as the Job Ticket, for employees (as testified in different cases, including the GreenPATH pilot areas of Berlin, Vienna and Ravenna) and “semester ticket” for students (as in the case of Berlin and Vienna).

### 4.4.1. Towards Maas & and a “holistic” approach

In any case, the effectiveness of solutions meant to provide an appealing and competitive alternative to car dependency strongly relies on synergically joining and integrating the different sustainable modes of transport while providing users with (ICT) tools for seamless intermodal connectivity. Only in this way, a smooth execution of multi-leg journeys can cope with the need to cater for varying trip lengths and destinations as well as user categories.

Nowadays, this is leading to a more holistic approach not only in the planning processes (as in the case of SUMPs) but also in pioneering Mobility-as-a-Service (MaaS) implementations currently under development and testing in different contexts. In this regard, fostering active mobility is more and more interwoven with broader systemic efforts to advance sustainable mobility ecosystems.

# 5. The role of communication and engagement: promotional campaigns for a sustainable mobility management in FUAs

Managing sustainable mobility effectively is not only a matter of infrastructure and technology; it also crucially depends on how ideas, initiatives and behaviours are communicated and promoted to the public. Clear, engaging and strategic communication is a key driver for achieving behavioural change, particularly in the complex environments of Functional Urban Areas (FUAs) where daily mobility patterns are deeply ingrained and shifting habits can be challenging.

## 5.1. Approaches for effectively communicating and engaging: general methodological guidelines

Designing successful communication campaigns to promote sustainable commuting in FUAs requires a structured and user-centric approach. Several key principles can be highlighted:

First, it is essential to **clearly define the target audience and your objectives**. Understanding who the campaign is addressing—commuters, students, or employees, and what you would like them to do - enables tailored messaging that speaks directly to their motivations, barriers, and aspirations.

Second, the promotional campaigns should exploit the **power of visuals**. Scientific studies have shown that our brains respond far more strongly to vivid, social stories than to abstract statistics. Using high-quality images, short engaging videos, and consistent branding (through logos, slogans, and colour schemes) dramatically increases the chances of grabbing and holding attention. A consistent visual identity will strengthen your brand value and make your product recognizable and competitive along with all the other existing initiatives.

Moreover, **personalized storytelling** plays a crucial role. Sharing testimonials or real-life success stories fosters trust and emotional connection, making the message more relatable and authentic. Every communication effort should also include a **clear and simple Call-to-Action (CTA)**, such as "Join the Challenge," "Download the App," or "Get Your Discount!".

**Tailored messaging** to your target audience showing what is the problem tackled, targeting the potential motivations of the user (health, safety, savings) and what is the outcome rather than the process will ensure you reach the audience effectively.

Third, an **omni-channel approach** is vital: combining digital media (social media platforms, mobile apps, websites) with traditional tools (such as posters, local press coverage, and community events) ensures maximum reach. Social media boosting (e.g., on Facebook or LinkedIn) remains a cost-effective way to amplify visibility, especially when compared to traditional media.

Finally, **language and tone** must be friendly, simple, and adapted to the local context. Communicating in the local language and avoiding overly technical jargon enhances accessibility and inclusiveness.

Integrating **incentives**—whether economic, symbolic, or experiential—into communication strategies further boosts engagement, making the desired behaviour change not just a rational choice, but an attractive and rewarding one.

## 5.2. Best practices/showcasing examples of promotional campaigns for a sustainable mobility management in FUA

As previously outlined, promotional campaigns for sustainable mobility can be broadly categorized into two complementary incentive approaches. The first relies on **economic advantage**, which directly lowers the financial cost of shifting to sustainable transport options. The second centres **on raising awareness** and engagement, often through gamification, which stimulates intrinsic motivation, community spirit, and personal satisfaction.

For the purpose of this study, we highlight two successful European examples that exemplify each of these approaches: the **Deutschlandticket campaign in Germany** and the **Ciclogreen app initiative in Spain**. Both campaigns achieved wide participation and behavioural change but did so through distinct communication strategies aligned with their respective incentive models.

### 5.2.1. The Deutschlandticket Campaign – Clear, Accessible, Economically Appealing

The *Deutschlandticket*, launched nationally in Germany, aimed to make public transport both economically attractive and easy to access. From a communication standpoint, the campaign stood out for its **consistency and clarity**.

- It relied on **mass media exposure** — TV, newspapers, public billboards — to ensure nationwide awareness.
- A **unified visual identity** was maintained throughout: a simple logo, straightforward messaging, and recognizable design elements made the campaign immediately identifiable.
- Online platforms played a key role in the user journey: websites offered streamlined subscription options and extensive FAQs to resolve doubts quickly.
- Social media content emphasized **cost savings and convenience**, often using comparisons to car travel and monthly fuel expenses.

### 5.2.2. The Ciclogreen App – Gamification, Storytelling, and Community

In contrast, *Ciclogreen* used **gamification** to promote sustainable commuting by rewarding users for walking, cycling, and using public transport. Rather than emphasizing cost, it focused on **personal progress, achievement, and community engagement**.

- The campaign was driven by **engaging social media content**, built around interactive challenges and competitions.
- **Visual storytelling** played a central role: users tracked their activity through progress bars, earned badges, and competed on leaderboards — reinforcing a sense of accomplishment and healthy competition.
- Crucially, the app involved **local employers and municipal authorities** as co-promoters, leveraging workplace networks and institutional trust to expand its reach.

## 5.3. Lessons for Successful Communication and Engagements in FUAs

Examining these two contrasting yet successful campaigns — the *Deutschlandticket* and the *Ciclogreen* app — reveals essential lessons for shaping effective promotional strategies for sustainable mobility within Functional Urban Areas.

The *Deutschlandticket* illustrates the power of clarity, simplicity, and broad accessibility when promoting economic incentives. A crucial takeaway is the importance of communicating tangible value. The campaign emphasized cost savings in a straightforward manner, ensuring that the benefit to the user was instantly understood. Communication relied on a unified visual identity, pairing a clean, recognisable logo with short, impactful messages. This consistency helped build national awareness and trust. Furthermore, the campaign's digital infrastructure was well-prepared to support the offer: online subscription platforms were intuitive, and FAQs addressed common concerns, removing barriers to adoption. Traditional and digital media complemented each other, creating a saturated but coherent media environment.

From this, it becomes clear that when implementing economic incentive schemes in FUAs, communication must underscore the **practicality and immediacy of the benefit**. Cost comparisons — especially between car use and sustainable alternatives — are a persuasive tool. Moreover, strategic visibility in physical locations like public transport hubs, combined with online outreach, maximizes campaign penetration. Institutional collaboration, particularly with municipalities and large employers, further strengthens trust and facilitates scale.

In contrast, the *Ciclogreen* app offers a different but equally compelling approach rooted in **gamification and user engagement**. Rather than appealing to financial rationality, it leverages emotional drivers: achievement, social belonging, and personal well-being. The campaign did not rely on mass media, but rather on dynamic, digital storytelling. Progress bars, badges, and leaderboards made sustainable travel visible, measurable, and rewarding. This visual language of success helped reinforce habits through positive feedback loops.

A significant insight here is that promoting sustainable mobility as an enjoyable, goal-oriented activity — not just a moral or ecological choice — enhances user participation and retention. Challenges and competitions brought a playful energy to mobility behaviour, transforming it from routine into something shareable and socially recognised. Importantly, *Ciclogreen* also illustrates the value of decentralised support networks: involving employers and municipalities as co-promoters increased legitimacy and expanded the platform's reach into everyday contexts like the workplace or local community.

From this perspective, awareness-raising campaigns in FUAs benefit greatly when they do more than inform — they must **invite participation and create meaning**. Success depends on ease of onboarding, intuitive design, and a sense of belonging to a shared mission. Visibility here is not just about being seen, but about being experienced: users must feel part of a positive, rewarding transformation.

Ultimately, what these two case studies reveal is that **no single approach fits all contexts**. Where cost is the primary barrier to sustainable mobility, lowering that threshold must be accompanied by clear, practical communication. Where habits and culture are the obstacles, emotional engagement and social recognition may be more powerful levers for change. But in both cases, the foundations of a successful campaign remain the same: **coherent messaging, accessible platforms, and active engagement of stakeholders** — not just as audiences, but as co-creators of the sustainable urban future.

# 6. Conclusions

The analysis conducted distilled a range of elements useful to define the reference framework for future activities connected to the uptake and upscale of solutions, including the development of local action plans, and will contribute to the development of the common GreenPATH Functional Urban Areas integrated planning strategy, providing guidance for coordinating, planning and implementing Mobility Management innovative actions in CE FUAs.

A cross cutting factor for innovation – particularly central and decisive for the implementation of a tech-oriented vision of mobility management policies and actions - is represented by the introduction of more

flexible work options, in particular smart/remote work, able to generate significant changes in commuting patterns.

With regard to **bike friendly smart city and measures promoting active travel**, key innovation factors for the ACTIVille scenario encompass social and environmental aspects such as environmental awareness campaign and eco-conscious attitude towards active and in general sustainable mobility options, as well as infrastructural elements including the construction of bike lanes and innovative mixt use roads, but also efficient and vulnerable-user oriented traffic management systems, and intermodal nodes (park&ride, bike&ride, etc.).

Furthermore, it is important to note that also legal aspects, from traffic calming to curb management and emission restrictions, and applications for smart travel planning, have a role in building active mobility-oriented urban environments.

Main takeaways from the analysed good practices are the following:

- Public policies as trigger, for bike friendly mobility actions by companies
- Engage and reward citizens embracing active mobility
- Create standards, certify bike-friendly companies
- Consolidate biking as commuting mode
- Co-design solutions with vulnerable groups
- Integrate mobility management planning with infrastructural and multimodal services-oriented measures.
- Plan land use and re-use according to active mobility and bike friendly principles

Concerning the **Transit hubs and measures enhancing public transport and shared mobility**, key innovation factors for the TRANSITopolis scenario encompass economic (zero emission and modern fleets, service frequency, discounts/incentives), social and environmental aspects (eco-conscious attitude towards active/sustainable mobility options, environmental awareness campaigns, friendly and more competitive public transit) as well as infrastructural elements (efficient and vulnerable-user oriented traffic management systems, intermodal nodes).

Moreover, legal aspects related to the reduction of emissions and to restrictions to private mobility, and elements of digitalisation such as travel planners and monitoring systems are relevant to the picture.

Main takeaways from the analysed good practices are the following:

- Create framework conditions and incentives for the development of sustainable mobility-based and car-free neighbourhoods
- Integrate flexible and inclusive services in public transport networks
- Build attractive alternatives for commuters, improving the quality of life of employees
- Integrate public transport and shared services, engaging citizens in co-design of sustainable options
- Promote intermodality and rational choices, limit private mobility for those who don't have viable alternatives
- Include in mobility management different aspects of daily life, including child care

Looking at **tech based solutions tailored to commuter categories**, key innovation factors for the TECHcommuteCity scenario encompass social and environmental aspects (eco-conscious attitude towards active/sustainable mobility options, environmental awareness campaigns) and obviously technological aspects (travel planning, innovative shared digitalised options in particular.

Together with that, legal aspects led by factors enabling the expansion of shared mobility operational areas, and furthermore curb side management, traffic calming, and legislation favouring zero emission vehicles are relevant elements for the implementation.

Additional infrastructural elements of the scenario are represented by the development of transit hubs (connected and hi-tech), and smart linear infrastructure.

Main takeaways from the analysed good practices are the following:

- A MaaS "community" approach can support the elaboration of integrated measures for commuters, providing a common framework for data analysis and development of solutions
- An inter-company dimension can be valuable for the development of viable mobility plans addressing common needs
- Physical and virtual spaces and adaptive policy frameworks are fundamental for testing innovations, commuters can experiment different solutions
- The integration between public transport and flexible/shared mobility services is a pre-requirement to foster sustainable innovations affecting behavioural change

The main results of the analysis will contribute to the evaluation of the potential of the GreenPATH solutions to the delivery of recommendations for policymakers on how to maximise the impact of mobility management measures in FUAs through the GreenPATH Strategy.

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