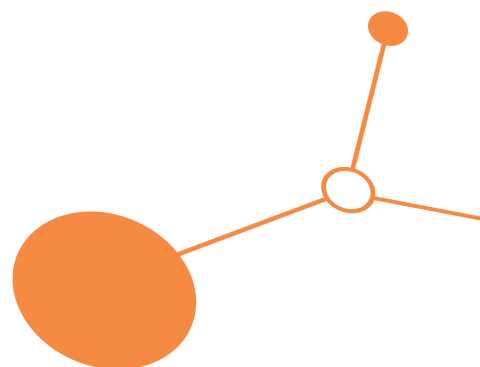
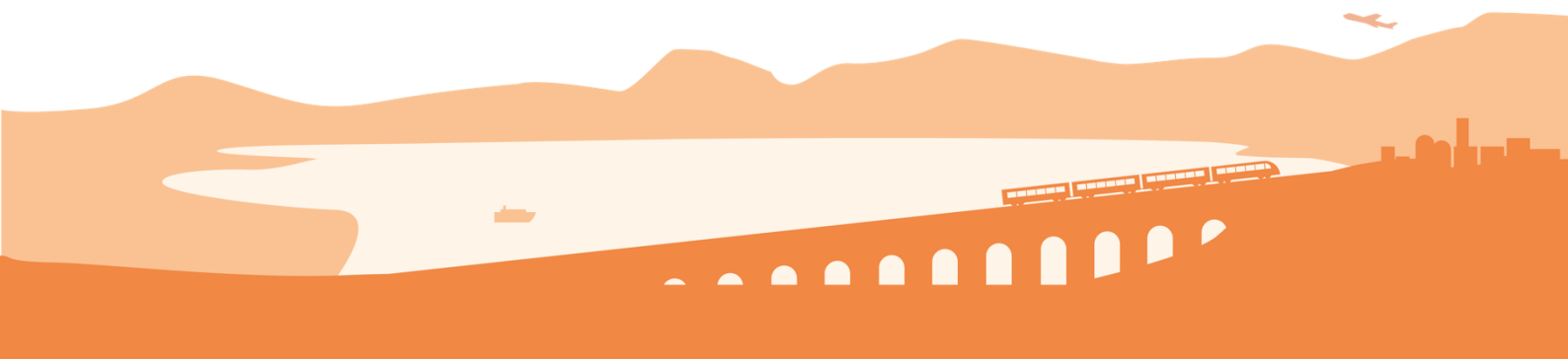


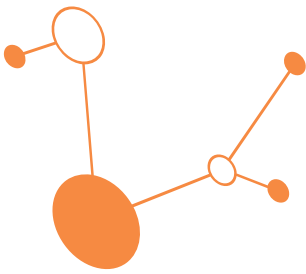
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Transnational strategy for integrated
transport and spatial planning for rural
and peripheral regions



Version 1
10/2025



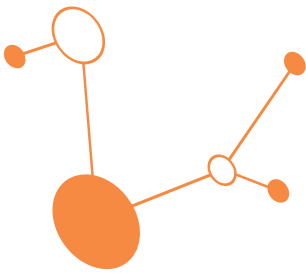


Introduction

Through contributions from participating territorial project partners and knowledge providers, NUTSHELL@CE developed this transnational strategy for integrated transport and spatial planning for rural and peripheral regions.

The core of this transnational strategy is twofold. On one hand, subdivided into five domains which are strongly interrelated to deliver integrated planning for transport and spatial development, we developed our common aims and actions to support policy delivery. This is based on inputs from stakeholders through interviews, which informs the background of the strategy, and on discussions during the NUTSHELL@CE transnational co-creation workshop held on 9th September 2025 in Nova Gorica, Slovenia. In this workshop we developed our common aims and list of actions. On the other hand, through the knowledge transfer activities to develop evidence about public transport service quality levels to inform policy development, we developed our common aims and actions to ensure availability of reliable, comprehensive and open data about public transport timetables and road network in digitized manners.

This strategy consists of aims and actions. While the strategy of the five domains - (1) public transport services, (2) local land use regulation, (3) regional economy, (4) spatial balance within regions and (5) role of active mobility - is addressed mainly to local and regional governments, the strategy for data and information availability and formats is mainly addressed to national governments.



Strategy

Domain 1 - Public transport services

Background

Many existing public transport (PT) services are consistently characterized by inadequacy in covering peripheral and rural needs, primarily focusing on established, often centralized, demand patterns. A major commonality is the low frequency of services outside of major urban corridors, with many rural areas receiving only a few connections per day, thus often rendering PT noncompetitive with private cars. This is frequently compounded by operational and economic challenges; services in sparsely populated areas are often deemed unprofitable due to low demand, leading to high operating costs and limitations in offering competitive services. This, in turn, discourages use and decreases the demand for PT, thus enabling a vicious circle.

Across regions, timetables suffer from chronic misalignment with diverse user needs. Services are typically organized around student transport and school hours, neglecting the needs of workers (especially shift workers), the elderly, and tourists, leading to limited availability during off-peak hours, evenings, and weekends. A second significant common issue is the fragmentation and lack of harmonization between different transport modes and operators. For instance, bus and rail timetables are often uncoordinated, leading to unstable schedules, delays, and inconvenient transfers. Infrastructure also presents barriers, including outdated railway lines (Slovenia, Crawinkel), insufficient priority for buses in traffic (Rzeszów), and a general lack of crucial intermodal infrastructure like integrated Park & Ride systems or mobility hubs.

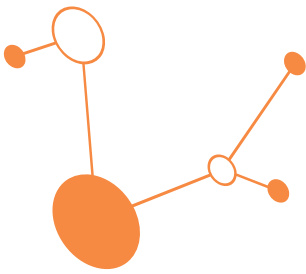
Aims

The aims within the domain of public transport services are to enhance accessibility, reliability, and integration of public transport systems across regions to reduce car dependency and CO₂ emissions.

Actions

This domain's actions comprise:

- Developing and synchronising multimodal timetables across networks among different modes such as bus, rail, and DRT.
- Introducing flexible, demand-responsive services for low-density and rural areas.
- Improving user experience through digital tools (e.g. real-time data, virtual timetables, information access via QR codes).
- Strengthening coordination of cross-border services (e.g. Graz-Maribor corridor).



Domain 2 - Local land use regulation

Background

The central challenge in local land use regulation across the functional areas is the lack of effective coordination between spatial and transport planning. This often results in patterns of development that reinforce car dependency rather than promoting sustainable mobility.

A shared trend, particularly visible in the Rzeszów Functional Area (ROF) and noted as a concern in the Savio River Valley (UVS), is suburbanization and dispersed settlement patterns. When new residential or industrial areas are created, they frequently lack harmonized public transport connections or sufficient frequencies, forcing residents to rely on private vehicles.

In urban centres, such as Rzeszów, development patterns show a divide: some areas (like the northern ROF) are more compact and better served by rail, while others (like the southern ROF) exhibit more dispersed growth.

Aims

Local land-use regulations' aims are to foster compact, transit-oriented, and mixed-use spatial developments, in order to support sustainable mobility and liveable communities.

Actions

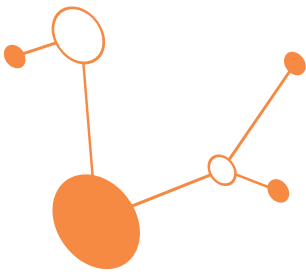
The actions in this domain consist of:

- Encouraging densification and redevelopment around transport hubs.
- Integrating mobility planning into local zoning and land use regulations.
- Reallocating urban space from private car use to public spaces accessible for all and green areas.
- Promoting inclusive design that ensures accessibility for all user groups, therein especially emphasising user groups that are marginalized today.

Domain 3 - Regional economy

Background

The regional economies face challenges rooted in poor transport connectivity, particularly concerning attracting and retaining population and workforce. In low-density areas such as UVS and Osoblaha, the concentration of essential services (healthcare, secondary schools) and employers in more distant cities requires residents to undertake long journeys, strengthening the role of PT as an essential service. Lack of reliable PT acts as a structural barrier to development and labour market competitiveness, as employers in the UVS, for example, report difficulties in attracting and retaining workers who are excluded from jobs due to insufficient public transport or lack of driving licenses. Conversely, employees face economic challenges due to the necessity of owning a car to drive to work.



Travel behaviour is highly centralized, with major urban centres (Rzeszów, Cesena) and key industrial/economic zones (like the Pratt & Whitney Rzeszów industrial complex) acting as strong poles of attraction for daily commuting.

Despite these issues, regions identify tourism as a significant economic opportunity, especially cycle tourism (UVS, Nova Gorica, and Osoblaha), for which PT could represent an important contributor. However, this potential remains underutilized because tourism mobility relies heavily on private cars.

Aims

This aim is to strengthen regional economies through sustainable mobility networks that support commuting, tourism, and business accessibility.

Actions

The aim will be implemented by the following actions:

- Improving transport links between rural areas, industrial zones, and urban centres.
- Developing mobility infrastructure that supports local tourism (e.g. bike service hubs, parking, info panels).
- Encouraging cooperation with employers to align mobility options with workforce needs.
- Stimulating innovation and green technology sectors (e.g. solar-powered hubs, e-mobility).

Domain 4 - Spatial balance within regions

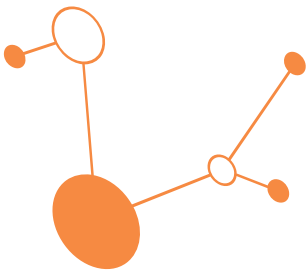
Background

A defining circumstance across the analysed regions is the inherent spatial imbalance and inequality in access between urban cores and surrounding rural/peripheral territories. While urban areas may be relatively well-served, the peripheral regions struggle with inadequate feeder services and connectivity, leading to increased social inequality in mobility.

A critical difference observed in multiple regions is the complexity introduced by administrative or geographical borders. The mobility needs of communities often transcend internal administrative boundaries (e.g. UVS bordering Tuscany) or national borders (e.g. Bratislava/Austria, Nova Gorica/Italy). In these border areas, accessing convenient services means referring to locations in a different administrative area, a process often hindered by disparities in transport services, differing regulations, and a lack of schedule coordination.

Aims

Promoting territorial cohesion by ensuring equitable access to mobility and services across urban, peri-urban, and rural territories.



Actions

The fourth domain's actions will comprise:

- Providing reliable public transport and active mobility options in remote or low-density areas.
- Integrating regional mobility strategies across administrative boundaries.
- Supporting shared mobility solutions (e.g. carpooling, shared parking, community bikes).
- Evaluating and monitoring accessibility and “quality of life” indicators to guide spatial planning.

Domain 5 - Role of active mobility

Background

Active mobility (walking and cycling) is widely recognized as essential for sustainable mobility goals, particularly in solving the first and last-mile connections to public transport. However, the current situation highlights significant infrastructural deficiencies and a lack of integrated planning.

A major common barrier is the underdeveloped and often unsafe infrastructure for pedestrians and cyclists. Many roads are shared with heavy motorized traffic, and continuous, safe cycling routes linking residential, urban, and industrial areas are frequently missing. In the Nova Gorica region, for instance, there are “no categorized cycle paths” in Brda, and infrastructure remains inadequate.

Crucially, active mobility is often treated as a stand-alone policy rather than being fully integrated with public transport. Users face difficulties combining cycling/walking with PT because of the lack of secure bike storage at stops and the scarcity of services allowing the transport of bicycles on buses, especially during leisure times or weekends.

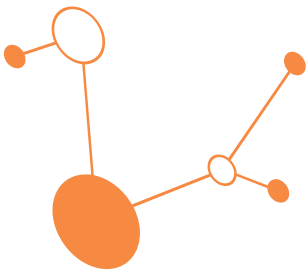
Aims

The final domain's aims are to increase the share of walking and cycling by building safe, connected, and appealing infrastructure networks.

Actions

The role of active mobility will be operationalized as follows:

- Developing cycling hubs with secure parking, charging, and repair facilities.
- Creating comfortable, shaded, and accessible pedestrian and cycling routes.
- Connecting active mobility to public transport nodes for first/last-mile travel.
- Encouraging behavioural change through awareness and design interventions, such as “pictograms” and wayfinding.



Data and information availability and formats

Background

Decision-making, informed by scientifically sound evidence is important for robustness, comprehensiveness and inclusiveness in the delivery of any policy. Policies on public transport are not an exception; in today's context, public transport is an important tool to ensure physical access of people both in cities and rural areas to facilities, amenities, services and opportunities, such as healthcare, education, jobs, shopping, entertainment, leisure, socializing, and so on, as well as to wider networks such as TEN-T.

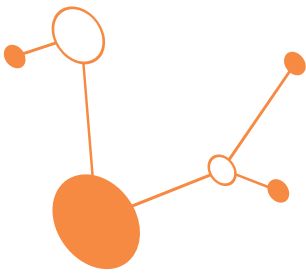
Unlike many other domains, it is not practicable to replicate a real public transport system to deliver evidence for policymaking. As a reliable alternative, a model-based approach needs to be used. As an instrument to develop evidence, Public Transport Service Quality Classifications (PTSQC) has been developed in Switzerland and Austria. NUTSHELL@CE demonstrated that this methodology is technically transferable to Central European countries, but to make this truly available as evidence to support policymaking for robust, comprehensive and inclusive policy delivery, many Central European countries still have some important points to address around the data availability and quality.

As for the availability of timetable data, some good examples exist such as the DELFI-Timetable in Germany and MVO Austria, but NUTSHELL@CE demonstrates that, even if digitized timetable data exists, the data are often owned and stored in a very fragmented manner. Data is sometimes only available on request, divided into different datasets by region and operator, or only partially entered. Some countries have comprehensive timetable data, but some key information to build evidence is missing, such as the location of stops in case of JDF data in the Czech Republic. Some countries or regions do not have such data at all.

As for the availability of road network data, NUTSHELL@CE had to rely on open-source data from OpenStreetMap. The quality of such open-source data varies from one region to another. Official road network data, as it exists for example in Austria, is not available in most of the other countries.

Aims

It is important to acknowledge that the timetable data is not only for passenger information, but also for building evidence to inform policymaking for public transport. Up-to-date, reliable and comprehensive public transport timetable data should be made available openly and free-of-charge in standardized formats. While NeTEx (Network Timetable Exchange) is developed as a European format, data availability in GTFS (General Transit Feed Specification), which is an international de-facto standard, is of the same importance in the context of evidence building.



Actions

Delivery of reliable data is beyond the scope of municipal governments, while public transport runs beyond municipal and regional borders. In light of these characteristics, the following actions are recommended for national governments, and where relevant for regional governments.

- If not yet available, the national government should assign the public transport authority a role to collect, maintain and archive up-to-date digital timetables, including geolocation information of stops, from all operators in each country.
- As for public transport, NeTEx and GTFS data should be made convertible to each other in an easy-to-use tool.
- GTFS and NeTEx data should be entered complete and consistent to the data standard.
- The national government should ensure an integration platform of all public transport timetable data.
- If not yet available, the national government should ensure that an integrated road network database (national road graphs) is made available in an integrated manner, with reliable and up-to-date data from primary sources i.e. the owners of the roads.
- Governments should collect and provide georeferenced POI and business information as well as certain land cover features in a coherent and integrated manner.
- All this data should be made publicly accessible free of charge, ideally through download from a website in a standard open data format and made accessible via APIs (application programming interfaces).
- To provide high standards for data quality and integrity across all regions, governments should consider imposing data integrity principles not only for databases provided by the government but also for private online database, including but not limited to open-source ones such as the OSM or even private ones such as Google Map. These non-governmental entities almost have a monopoly in the domain of free spatial data.