

EIB Jaspers

CAPACITY BUILDING FOR SUSTAINABLE URBAN MOBILITY PLANS

URBAN NODES AND THE INTERFACE BETWEEN LOCAL AND STRATEGIC TRANSPORT

Stockholm, 5-6 May 2026

AT THE END OF THIS MODULE, YOU WILL...

- know what an urban node is and how it relates to the TEN-T network
- understand the interaction between strategic and local transport in urban nodes
- be able to point out the challenges that arise in planning in urban nodes
- get an idea of the possible synergies and opportunities
- go home with some inspiring examples in how to address challenges

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Learning Objectives:

By the end of this module, you will:

1. Understand the Concept of Urban Nodes:

1. Definition and significance of urban nodes.
2. Relationship between urban nodes and the Trans-European Transport Network (TEN-T).

2. Comprehend the Interaction Between Strategic and Local Transport:

1. Dynamics between long-distance transport and local mobility.
2. The impact of strategic transport planning on urban areas.

3. Identify Challenges in Planning Urban Nodes:

1. Common issues faced during the planning and integration of urban nodes.
2. Balancing growth, sustainability, and mobility.

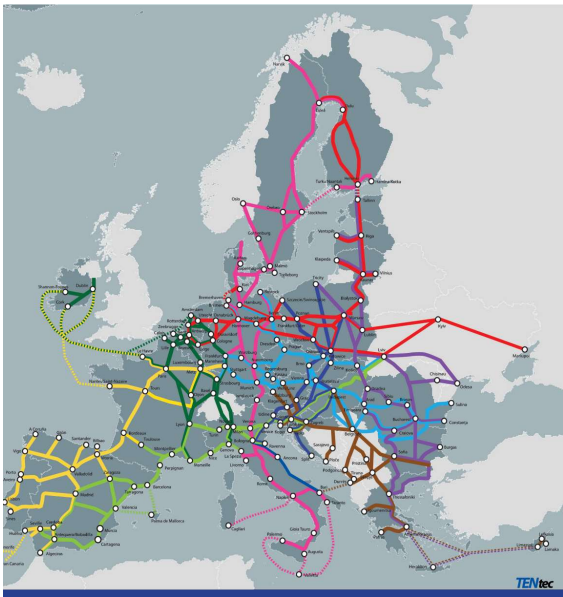
4. Recognize Synergies and Opportunities:

1. Potential benefits of well-planned urban nodes.
2. Opportunities for economic growth, environmental sustainability, and improved quality of life.

5. Explore Inspiring Examples:

1. Case studies and examples of successful urban node integration.
2. Innovative solutions to common planning challenges.

IMPORTANCE OF URBAN NODES IN THE TEN-T NETWORK



The European Transport Corridors

Urban nodes play a **pivotal role within the TEN-T framework**, as they serve as 'cross-roads' where different levels of transport networks converge in densely populated areas with high transport needs.

- The new TEN-T approach identifies **> 400 urban nodes** (compared to 88 in the past)
- **Good performance** at the level of urban **nodes is essential** to reach the TEN-T goals.
- **What does it mean to be an urban node in TEN-T?**
 - Initialize and conclude their SUMPs by year 2027
 - Collect and submit urban mobility data to the European Commission by 2027
 - Develop multimodal passenger hubs by 2030 to improve connectivity and address first and last-mile challenges
 - Have access to at least one multimodal freight terminal by 2040

Introduction to Urban Nodes in TEN-T

•Overview:

- Urban nodes are pivotal within the TEN-T framework.
- Act as 'cross-roads' where different transport networks, such as road, rail, air, and maritime, converge.
- Strategically located in densely populated areas with high transport demand and significant economic activity.

Functions of Urban Nodes

•Functions:

- Facilitate the integration of TEN-T with regional and local transport networks.
- Support the movement of people and goods, enhancing connectivity and economic integration.
- Serve as critical hubs for logistics and passenger transport, improving efficiency and reducing bottlenecks.

Expansion of Urban Nodes in TEN-T

•New Approach:

- The new TEN-T strategy has expanded the number of urban nodes from 88 to over 400.
- Reflects a broader and more inclusive approach to integrating transport

networks across Europe.

- Aim: to enhance coverage, connectivity, and resilience of the transport network.

Rationale for Expansion

•Reasons:

- Increased recognition of the role urban nodes play in supporting regional and local economies.
- Need for more comprehensive coverage to address transport needs in growing urban areas.
- Facilitate better integration of peripheral regions into the TEN-T network.

Importance of Good Performance at Urban Nodes

•Key Point:

- Efficient and well-managed urban nodes are essential to meet the goals of the TEN-T.
- Good performance ensures seamless connectivity, reduces congestion, and improves transport efficiency.
- Enhances the overall reliability and effectiveness of the TEN-T network.

Key Performance Indicators

•Indicators:

- Transport efficiency: Reduced travel times and delays.
- Connectivity: Improved access to regional, national, and international networks.
- Sustainability: Adoption of eco-friendly transport modes and practices.
- User satisfaction: Improved service quality for passengers and freight operators.

Responsibilities of Urban Nodes in TEN-T

•Definition:

- Urban nodes have specific criteria and responsibilities within the TEN-T framework.
- These include planning, data collection, infrastructure development, and operational efficiency.

SUMP Requirements by 2027

•SUMPs:

- Urban nodes must initialize and finalize their SUMPs by 2027.
- SUMPs provide strategic planning for sustainable and integrated urban mobility.
- Include measures for reducing congestion, promoting public transport, cycling, walking, and lowering emissions.

Data Submission Requirements by 2027

•Urban Mobility Data:

- Urban nodes must collect and submit comprehensive urban mobility data to the European Commission by 2027.
- Data collection is crucial for monitoring progress, policy formulation, and decision-making.

Types of Data Required**•Data Types:**

- Transport usage statistics: Passenger and freight volumes across different modes.
- Mobility patterns: Commuting habits, travel times, and congestion levels.
- Environmental impact: Emissions, energy consumption, and air quality.
- Infrastructure status: Condition and capacity of transport facilities.

Development of Multimodal Passenger Hubs by 2030**•Passenger Connectivity:**

- Urban nodes must develop multimodal passenger hubs by 2030.
- These hubs integrate various transport modes, such as buses, trains, trams, and bicycles, improving connectivity and addressing first and last-mile challenges.

Benefits of Multimodal Hubs**•Benefits:**

- Enhanced convenience and accessibility for passengers.
- Reduced travel times and improved reliability.
- Increased use of public transport and reduced dependency on private cars.
- Support for sustainable and eco-friendly transport options.

Access to Multimodal Freight Terminals by 2040**•Freight Transport:**

- Urban nodes must ensure access to at least one multimodal freight terminal by 2040.
- Multimodal terminals facilitate the efficient transfer of goods between different transport modes (e.g., rail, road, sea).

Benefits of Multimodal Freight Terminals**•Benefits:**

- Improved efficiency and cost-effectiveness of freight transport.
- Reduced congestion and environmental impact through optimized logistics.
- Enhanced connectivity and competitiveness of urban nodes within the global supply chain.
- Support for regional economic development and job creation.

EU: THE NEW TEN-T REGULATION

New EU Regulation 2024/1679 for the TEN-T Network development

<https://eur-lex.europa.eu/legal-content/>

Multimodal transport network: railway, inland waterways, ports, motorways, airports, freight intermodal terminals and **urban nodes**.

Objectives:

- **Art. 170 - 172**
- **Transport Decarbonisation** (European Green Deal)
- **More efficient and less congested Transport**
 - Multimodality and interoperability
 - Elimination of bottlenecks
 - Completion missing links
 - **Better integration urban nodes**
- **Resilience to Climate Change**

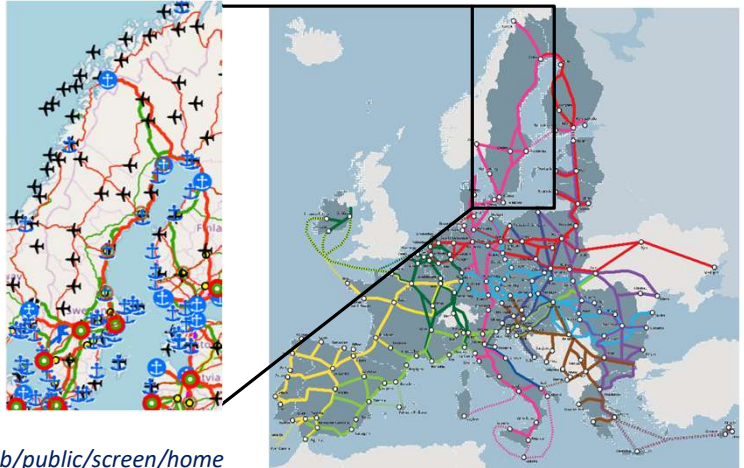
Requisites & priorities:

- 2030 – Core Network
- 2040 - Extended Core Network
- 2050 – Comprehensive Network

Mechanisms for governance, control and reporting.

Visors: TENTec (UE) <https://webgate.ec.europa.eu/tentec-maps/web/public/screen/home>

The European Transport Corridors



Capacity Building for Sustainable Urban Mobility Plans – Urban Nodes

4

Expansion of Urban Nodes in the TEN-T Regulation

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TEN-T URBAN NODES – ROLE AND REQUIREMENTS

Why are they important to the TEN-T Network ?

Urban nodes play a **pivotal role within the TEN-T framework**, as they serve as 'cross-roads' where different levels of transport networks converge in densely populated areas with high transport needs.

- The new TEN-T approach identifies **> 400 urban nodes** (compared to 88 in the past)
- **Good performance** at the level of urban **nodes is essential** to reach the TEN-T goals, e.g.:
 - Urban Nodes play a key role in sustainability / efficiency & accessibility
 - Central elements of the network to collect and distribute transport flows <-> potential bottlenecks ?

What are the main requirements for TEN-T Nodes ?

- **What does it mean** to be an urban node in TEN-T?
 - Initialize and adopt their SUMPs by year 2027
 - Collect and submit urban mobility data to the European Commission by 2027
 - Develop multimodal passenger hubs by 2030 to improve connectivity and address first and last-mile challenges
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Importance of Good Performance at Urban Nodes

•Key Point:

- Efficient and well-managed urban nodes are essential to meet the goals of the TEN-T.
- Good performance ensures seamless connectivity, reduces congestion, and

improves transport efficiency.

- Enhances the overall reliability and effectiveness of the TEN-T network.

Key Performance Indicators

•Indicators:

- Transport efficiency: Reduced travel times and delays.
- Connectivity: Improved access to regional, national, and international networks.
- Sustainability: Adoption of eco-friendly transport modes and practices.
- User satisfaction: Improved service quality for passengers and freight operators.

Responsibilities of Urban Nodes in TEN-T

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SUMP Requirements by 2027

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Data Submission Requirements by 2027

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Types of Data Required

•Data Types:

- Transport usage statistics: Passenger and freight volumes across different modes.
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Development of Multimodal Passenger Hubs by 2030

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Benefits of Multimodal Hubs

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Access to Multimodal Freight Terminals by 2040

•Freight Transport:

- Urban nodes must ensure access to at least one multimodal freight terminal by 2040.
- Multimodal terminals facilitate the efficient transfer of goods between different transport modes (e.g., rail, road, sea).

Benefits of Multimodal Freight Terminals

•Benefits:

- Improved efficiency and cost-effectiveness of freight transport.
- Reduced congestion and environmental impact through optimized logistics.
- Enhanced connectivity and competitiveness of urban nodes within the global supply chain.
- Support for regional economic development and job creation.

TEN-T NETWORK REQUIREMENTS

- **Train speeds:** By 2040, passenger rail lines in the core and extended core networks will need to support trains travelling at speeds of 160 km/h or higher.
- **European Rail Traffic Management System (ERTMS):** the single European signaling system will be deployed across the entire TEN-T network, improving rail safety and efficiency. National systems will be phased out.
- **Airport connectivity:** Major airports with more than 12 million passengers per year must be connected to long-distance rail, making rail a competitive alternative to domestic flights.
- **Freight terminals:** The number and capacity of transshipment terminals will be expanded to meet traffic demand. (including 740-metre-long trains, sustainable modes of transport and the upgrading of the combined transport sector in Europe).
- **Alternative fuels:** The TEN-T is the basis for the roll-out of recharging and refueling points for alternative fuels, such as hydrogen. It integrates the requirements of the Alternative Fuels Infrastructure Regulation for nodes and terminals.
- **Urban mobility:** All major cities along the TEN-T network will have to develop sustainable urban mobility plans (SUMP) to promote zero and low-emission mobility.

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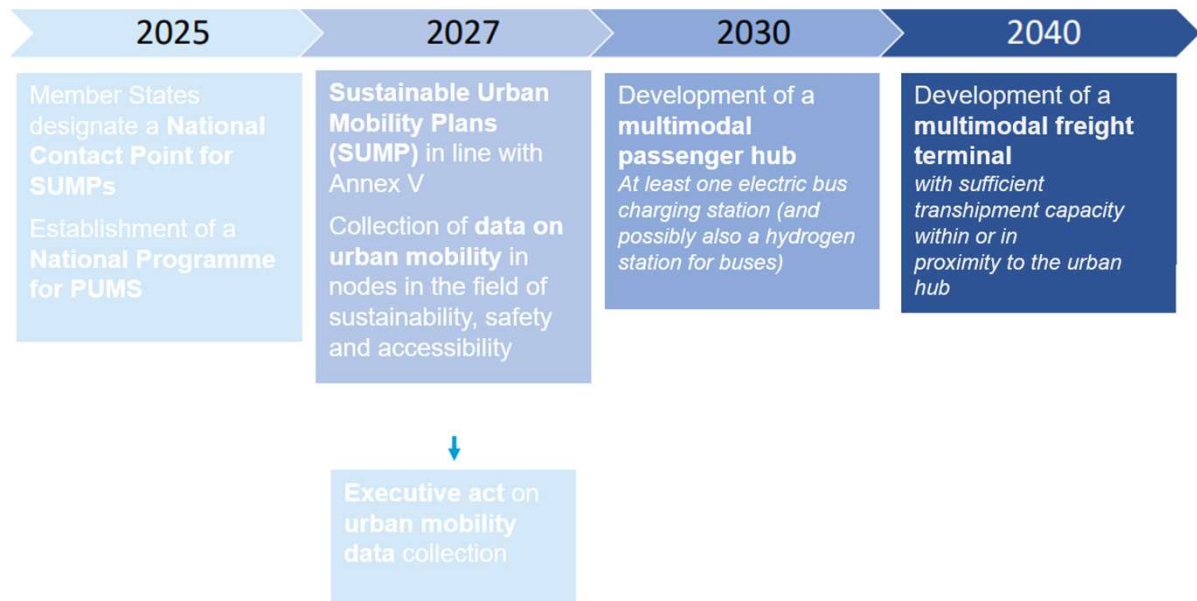
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THE ROLE OF MEMBER STATES AND METROPOLITAN CITIES

The timetable for urban nodes in the TEN-T network



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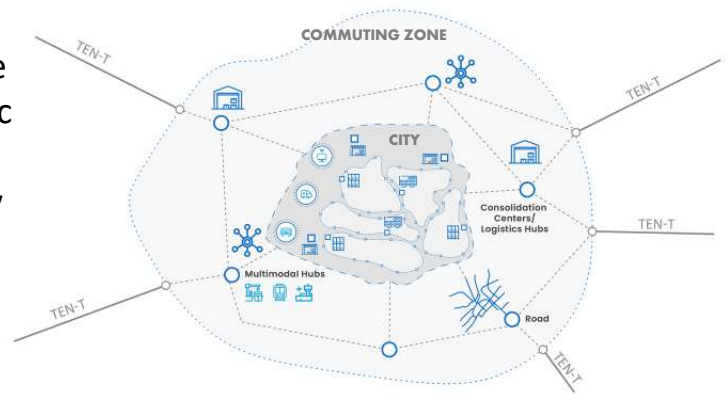
- Improved efficiency and cost-effectiveness of freight transport.
- Reduced congestion and environmental impact through optimized logistics.
- Enhanced connectivity and competitiveness of urban nodes within the global supply chain.
- Support for regional economic development and job creation.

DEFINITION: URBAN NODE

“Urban node” means an urban area where **elements of the transport infrastructure of the TEN-T network**, such as ports, including passenger terminals, airports, railway stations, bus terminals, logistics platforms and facilities, freight terminals, located in and around the **urban area**, are **connected with other elements of that infrastructure and with the infrastructure for regional and local traffic**

Definition of an urban node
in TEN-T (Article 3 of Regulation)

- An urban node is not a specific location, but a **functional city**



- Criteria TEN-T nodes:
 - 100,000 inhabitants or more, or
 - Main node of a NUTS 2 region in case no city above 100,000 inhabitants
- Not every urban area is an urban node (TEN-T definition)
 - Principles in this module for urban nodes apply to any urban area

Urban Node Definition

•Urban Node:

- An urban area where elements of the TEN-T (Trans-European Transport Network) infrastructure connect with regional and local traffic infrastructure.
- These elements include ports, passenger terminals, airports, railway stations, bus terminals, logistics platforms and facilities, and freight terminals located in and around the urban area.
- It is a functional urban area rather than a specific geographic location.

Criteria for TEN-T Urban Nodes

•Population Requirement:

- Must have 100,000 inhabitants or more.

•Regional Importance:

- Can also be the main node of a NUTS 2 region if there is no city with 100,000 inhabitants within that region.

•Exclusivity:

- Not every urban area qualifies as an urban node under the TEN-T definition.

Applicability of Principles

•General Application:

- Although the module focuses on urban nodes as defined by the TEN-T, the principles discussed apply to any urban area.

MORE THAN TRANSPORTATION ALONE



Multimodal hub (DUT Partnership)

- There is more to consider than just making sure transport is arranged well in the urban area
- All kinds of non-transportation related services **add value to a multimodal hub**
- Win-win-opportunities in integrating mobility and **spatial planning**.

Want to know more?

»»» MODULE 17

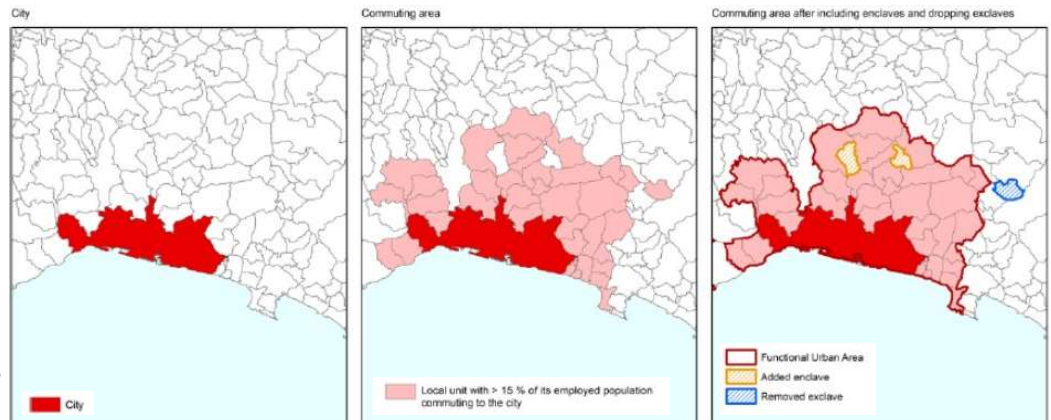
- Effective urban nodes require more than just well-arranged transport systems.
- Integration of non-transportation related services is crucial for adding value to multimodal hubs.
- Addressing comprehensive urban needs enhances the functionality and appeal of these hubs.

Module 17 delves deeper into the above concepts.

URBAN NODES AND FUNCTIONAL URBAN AREAS

DG REGIO

- Urban nodes relate to the **functional urban area** of a city
- Functional Urban Area (FUA) is a densely inhabited **city** and a less densely populated **commuting zone** whose labour market is highly integrated with the city (OECD, 2012)
- Cities and functional urban areas (EUROSTAT)



- Identify an **urban centre**: a set of contiguous, high density (1,500 residents per km²) grid cells with a population of 50,000 in the contiguous cells.
- Identify a **city**: one or more local units that have at least 50% of their residents inside an urban centre.

- Identify a **commuting zone**: a set of contiguous local units that have at least 15% of their employed residents working in the city.

- A **functional urban area** is the combination of the city with its commuting zone.

Urban Nodes and Functional Urban Areas

•Urban Nodes:

- Urban nodes relate to the functional urban area of a city.
- They are critical points where TEN-T infrastructure integrates with regional and local traffic systems.

•Functional Urban Area (FUA):

- Defined by the OECD (2012) as a densely inhabited city and a less densely populated commuting zone.
- The labour market in the commuting zone is highly integrated with the city.

Characteristics of Functional Urban Areas (FUA)

•Densely Inhabited City:

- Core urban area with high population density.

•Commuting Zone:

- Surrounding areas with lower population density.
- High levels of commuting to the core city for employment, indicating strong labour market integration.

FUA per Country - Overview

•FUA in Different Countries:

- FUAs vary significantly by country in terms of size, population, and integration levels.

Identifying an Urban Centre

•Urban Centre:

- Defined as a set of contiguous, high-density grid cells.
- Density requirement: 1,500 residents per km².
- Population requirement: At least 50,000 residents in the contiguous cells.

Visualizing an Urban Centre

•Diagram:

- Show a map with grid cells highlighting high-density areas.
- Example of a contiguous area meeting the density and population criteria.

Identifying a City

•City:

- One or more local units that have at least 50% of their residents inside an urban centre.
- Emphasizes the connection between the urban centre and administrative boundaries.

Visualizing a City

•Diagram:

- Illustrate how local units overlap with the urban centre.
- Example showing local units with over 50% of residents in the urban centre.

Identifying a Commuting Zone

•Commuting Zone:

- Defined as a set of contiguous local units.
- Requirement: At least 15% of employed residents commute to work in the city.
- Highlights the integration of surrounding areas with the city's labour market.

Visualizing a Commuting Zone

•Diagram:

- Show a map highlighting local units forming the commuting zone.
- Example illustrating commuting patterns and connections to the city.

Combining Components into a Functional Urban Area

•FUA:

- Combination of the city and its commuting zone.
- Represents the broader area of economic and social integration.

Visualizing a Functional Urban Area

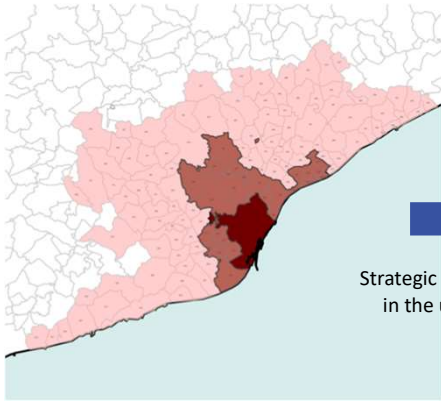
•Diagram:

- Comprehensive map showing the urban centre, city, and commuting zone.

- Example illustrating the full scope of an FUA.

AN EXAMPLE: URBAN NODE BARCELONA

URBAN NODE =
'functional urban area' of Barcelona



FUA Barcelona
(Instituto Nacional de Estadística)



Port



Sants railway station



Southern ringroad

Strategic infrastructure
in the urban node

El Prat airport



•An Example of an Urban Node: Barcelona

Introduction to Barcelona as an Urban Node

•Overview:

- Barcelona is a major urban node within the TEN-T network.
- It serves as a key connection point for various transport infrastructures, both regional and local.

Significance of Barcelona as an Urban Node

•Economic and Transport Hub:

- Barcelona's role in the TEN-T network as a major transport and logistics hub.
- Importance of ports, passenger terminals, airports, and other transport infrastructures.

•Urban Planning and Development:

- Strategic urban planning initiatives aimed at enhancing connectivity and sustainability.

THE ROLE OF MEMBER STATES AND METROPOLITAN CITIES

As it is stated in Article 41, roles for urban nodes are as following:

- Adoption of SUMP (Annex 5) – see below)
- Collection of data (new UMI indicators)
 - End Dec 2030 – development of multimodal passenger hubs
 - End Dec 2040 – development of multi-modal freight terminal

By **2027**, Member States will have to ensure **that each urban node has a SUMP** that is aimed at improving accessibility and mobility within the functional city and

- Includes measures to **integrate different modes of transport** and shift to sustainable mobility,
- promote **efficient zero- and low-emission mobility**, including urban logistics,
- reduce **air and noise pollution**, and
- assess **transport accessibility** for users.



Source: TRT

Funded by the European Union

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- Urban nodes must initialize and finalize their SUMPs by 2027.
- SUMPs provide strategic planning for sustainable and integrated urban mobility.
- Include measures for reducing congestion, promoting public transport, cycling, walking, and lowering emissions.

Data Submission Requirements by 2027

•Urban Mobility Data:

- Urban nodes must collect and submit comprehensive urban mobility data to the European Commission by 2027.
- Data collection is crucial for monitoring progress, policy formulation, and decision-making.

Types of Data Required

•Data Types:

- Transport usage statistics: Passenger and freight volumes across different modes.
- Mobility patterns: Commuting habits, travel times, and congestion levels.
- Environmental impact: Emissions, energy consumption, and air quality.
- Infrastructure status: Condition and capacity of transport facilities.

Development of Multimodal Passenger Hubs by 2030

•Passenger Connectivity:

- Urban nodes must develop multimodal passenger hubs by 2030.

- These hubs integrate various transport modes, such as buses, trains, trams, and bicycles, improving connectivity and addressing first and last-mile challenges.

Benefits of Multimodal Hubs

•Benefits:

- Enhanced convenience and accessibility for passengers.
- Reduced travel times and improved reliability.
- Increased use of public transport and reduced dependency on private cars.
- Support for sustainable and eco-friendly transport options.

Access to Multimodal Freight Terminals by 2040

•Freight Transport:

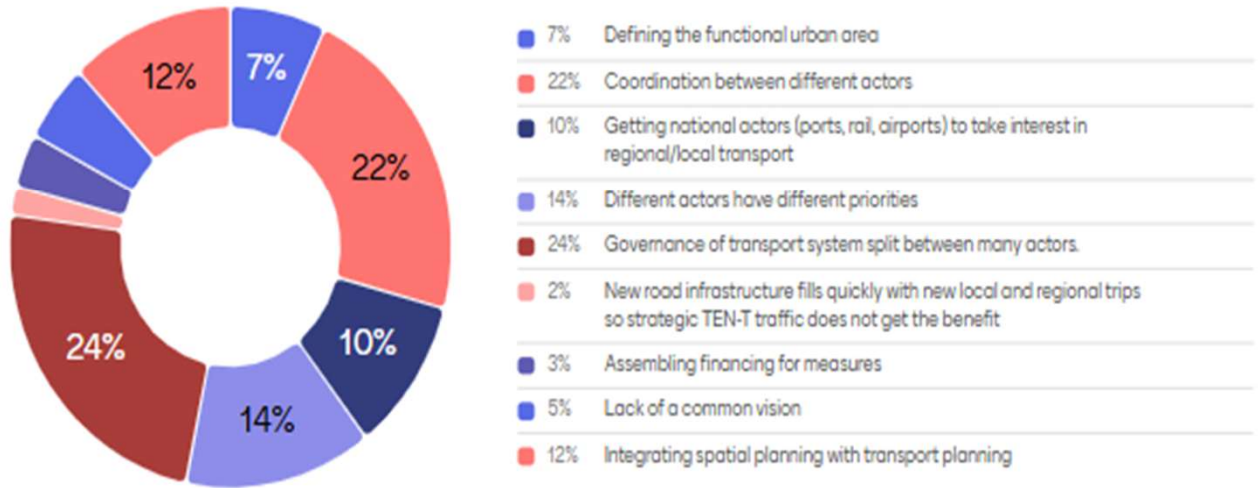
- Urban nodes must ensure access to at least one multimodal freight terminal by 2040.
- Multimodal terminals facilitate the efficient transfer of goods between different transport modes (e.g., rail, road, sea).

Benefits of Multimodal Freight Terminals

•Benefits:

- Improved efficiency and cost-effectiveness of freight transport.
- Reduced congestion and environmental impact through optimized logistics.
- Enhanced connectivity and competitiveness of urban nodes within the global supply chain.
- Support for regional economic development and job creation.

Select the two most important challenges to you to working across an urban node



Mentimeter exercise (MCQ).

Question: Select the two most important challenges to you to working across an urban node:

- Defining the functional urban area
- Coordination between different actors
- Getting national actors (ports, rail, airports) to take interest in regional/local transport
- Different actors have different priorities
- Governance of transport system split between many actors.
- New road infrastructure fills quickly with new local and regional trips so strategic TEN-T traffic does not get the benefit
- Assembling financing for measures
- Lack of a common vision
- Integrating spatial planning with transport planning

FUNCTIONALITY OF TRANSPORT INFRASTRUCTURE

Strategic



Local



Who uses which layer of transport infrastructure?

Introduction to Transport Infrastructure Layers

•Overview:

- Transport infrastructure is composed of different layers that serve various strategic and local purposes.
- Understanding who uses each layer helps in planning and optimizing the transport network.

Strategic Transport Infrastructure

•Strategic Layer:

- Includes major transport networks like highways, national railways, airports, and seaports.
- Designed to facilitate long-distance travel and the movement of goods across regions and countries.

Users of Strategic Transport Infrastructure

•User Segments:

- **Long-Distance Travelers:** Individuals traveling between cities, regions, or countries, often for business, tourism, or other purposes.
- **Freight and Logistics Companies:** Transporting goods across large distances, ensuring supply chain efficiency.
- **Public Transport Operators:** Operating intercity and international bus and rail services.

Examples of Strategic Transport Infrastructure

•Examples:

- Highways such as the Trans-European Transport Network (TEN-T) corridors.
- Major railway lines connecting key cities and regions.
- International airports and major seaports.

Local Transport Infrastructure

•Local Layer:

- Comprises local roads, public transit systems (buses, trams, local trains), bicycle lanes, and pedestrian pathways.
- Designed to facilitate daily commutes, short-distance travel, and local distribution of goods.

Users of Local Transport Infrastructure

•User Segments:

- **Commuters:** Individuals traveling within a city or metropolitan area for work, school, or daily activities.
- **Local Businesses:** Distributing goods and services within the local area.
- **Residents:** Using transport for shopping, leisure, and other personal activities.
- **Public Transport Users:** Relying on buses, trams, and local trains for their daily commute.

Examples of Local Transport Infrastructure

•Examples:

- City bus networks and tram systems.
- Local road networks and neighborhood streets.
- Bicycle lanes and pedestrian pathways.

Integration Between Strategic and Local Layers

•Integration:

- Effective transport systems require seamless integration between strategic and local layers.
- Multimodal hubs, park-and-ride facilities, and well-designed transit stations facilitate this integration.

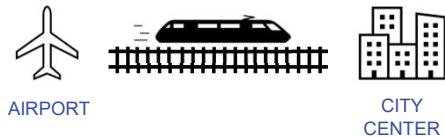
Benefits of Layer Integration

•Benefits:

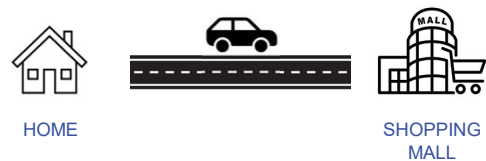
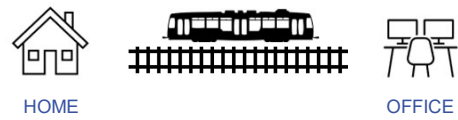
- Improved connectivity and reduced travel times.
- Enhanced convenience for users transitioning between long-distance and local travel.
- Increased efficiency in freight and passenger transport.

STRATEGIC VERSUS LOCAL VALUE TRIPS: EXAMPLES

Strategic value
(high value of time)



Local value
(low value of time)



How to align the type of infrastructure to the type of trip?

Introduction to Trip Types and Infrastructure

•Overview:

- Transport infrastructure must cater to different trip types: strategic and local.
- Strategic trips have a high value of time, requiring efficient, long-distance transport.
- Local trips have a lower value of time, focusing on short-distance, everyday travel.

Strategic Value Trips

•Definition:

- Strategic trips involve high value of time.
- Examples: business travel, long-distance commuting, freight transport.

•Characteristics:

- Require fast, reliable, and direct transport options.
- Infrastructure: highways, express trains, airports, major seaports.

Local Value Trips

•Definition:

- Local trips involve a lower value of time.
- Examples: daily commutes, local shopping trips, school runs.

•**Characteristics:**

- Require convenient, accessible, and frequent transport options.
- Infrastructure: local roads, buses, trams, bike lanes, pedestrian pathways.

Examples of Strategic Value Trips

•**High-Value Time Trips:**

- **Business Travel:** Using airports and high-speed rail for quick, long-distance travel.
- **Freight Transport:** Utilizing major highways and seaports for efficient goods movement.
- **Long-Distance Commuting:** Commuter trains and express buses connecting cities and regions.

Examples of Local Value Trips

•**Low-Value Time Trips:**

- **Daily Commutes:** Local buses, trams, and cycling for short-distance travel.
- **Local Shopping Trips:** Accessible road networks, pedestrian zones, and parking facilities.
- **School Runs:** Safe pedestrian pathways, local bus routes, and cycling lanes.

Aligning Infrastructure to Trip Types

•**Strategic Infrastructure:**

- Design for speed, capacity, and connectivity.
- Examples: Highways, high-speed rail networks, airports, and seaports.

•**Local Infrastructure:**

- Design for accessibility, convenience, and frequency.
- Examples: Local roads, public transport networks, bike lanes, and pedestrian areas.

Strategies for Effective Alignment

•**Planning and Policy:**

- Develop comprehensive transport plans that integrate strategic and local needs.
- Prioritize investment based on trip types and infrastructure requirements.

•**Technology and Innovation:**

- Implement smart transport solutions for real-time management and efficiency.
- Use data analytics to optimize transport networks and enhance user experience.

COMPETING FOR THE SAME NETWORK CAPACITY

- Trips with **strategic value** and trips with **local value** are competing for capacity of the same network
- **Passenger transport and freight transport** often share infrastructures resulting in challenges concerning capacity



Introduction to Network Capacity Competition

•Overview:

- Both strategic value trips and local value trips compete for the same transport network capacity.
- Passenger and freight transport often share infrastructures, leading to capacity challenges.

Shared Infrastructure Challenges

•Shared Infrastructure:

- Commonly used by both passenger and freight transport.
- Examples: highways, railways, and ports.

•Challenges:

- Capacity constraints leading to congestion and delays.
- Conflicts between high-speed passenger services and slower freight movements.
- Maintenance and infrastructure wear due to mixed usage.

Examples of Capacity Challenges

•Highways:

- Congestion during peak hours due to commuter traffic and freight transport.
- Balancing the needs of long-distance freight trucks and local passenger vehicles.

•**Railways:**

- Limited track availability leading to scheduling conflicts between passenger and freight trains.
- Prioritizing high-speed passenger services can delay freight deliveries.

•**Ports and Airports:**

- Competing demands for space and resources from cargo operations and passenger services.
- Managing peak times for both freight shipments and passenger flights.

Strategies to Address Capacity Challenges

•**Infrastructure Expansion:**

- Investing in additional lanes, tracks, and facilities to increase capacity.
- Developing dedicated freight corridors to separate passenger and cargo transport.

•**Operational Improvements:**

- Implementing advanced traffic management systems to optimize flow.
- Scheduling strategies to balance peak times and reduce conflicts.

•**Technology and Innovation:**

- Utilizing smart technologies for real-time monitoring and dynamic adjustments.
- Implementing automated systems for better resource allocation and efficiency.

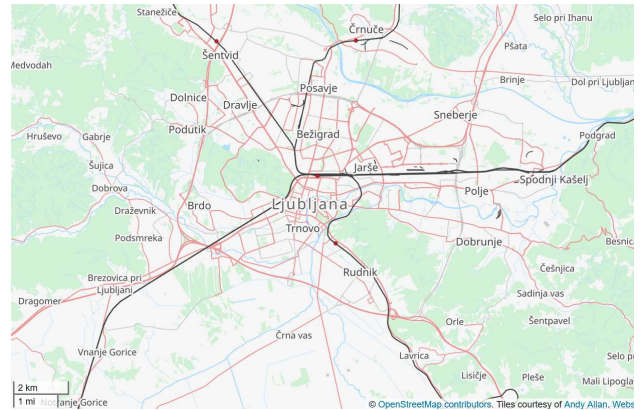
Module 15 delves deeper into the above concepts.

CASE STUDY: LJUBLJANA

- Introduce challenges by using the case study of Ljubljana
 - Need for improving local rail passenger transport (local/regional function)
 - All rail capacity through the node is used by freight (strategic function)

- Planning in urban nodes is not easy:

- Ljubljana serves as a critical node for freight transport, connecting various regional and international routes.
- The heavy use of rail capacity for freight transport creates a conflict with the need for efficient local passenger services.
- Balancing the needs of different transport functions requires careful planning and coordination.



•Overview:

- Ljubljana, the capital of Slovenia, faces significant challenges in balancing local and strategic transport functions.
- The case study of Ljubljana highlights the complexities of planning in urban nodes where both passenger and freight transport compete for the same rail capacity.

Challenges in Ljubljana

•Local Rail Passenger Transport:

- There is a pressing need to improve local rail passenger transport.
- Local rail services are crucial for daily commutes, reducing road congestion, and promoting sustainable mobility.

•Rail Capacity Usage:

- Currently, the rail capacity through Ljubljana is heavily utilized by freight transport.
- This prioritization of freight (strategic function) over passenger services creates significant challenges for local commuters.

Impact on Local Rail Services

•Consequences:

- Limited frequency and availability of local passenger trains.
- Increased travel times and inconvenience for daily commuters.

- Reduced attractiveness of rail as a sustainable transport option, leading to higher reliance on cars.

Strategic Function of Freight Transport

•Importance of Freight:

- Ljubljana serves as a critical node for freight transport, connecting various regional and international routes.
- Efficient freight transport is essential for economic activities, trade, and supply chain management.

•Conflict:

- The heavy use of rail capacity for freight transport creates a conflict with the need for efficient local passenger services.

Planning Challenges in Urban Nodes

•Complexities:

- Balancing the needs of different transport functions requires careful planning and coordination.
- Urban nodes like Ljubljana must address competing demands while optimizing available infrastructure.

•Stakeholder Involvement:

- Effective planning involves multiple stakeholders, including local governments, transport operators, businesses, and the community.
- The national government is leading a regional SUMP process; however, this is arguably less influential than the national rail and roads agencies who to an extent continue to pursue their own agendas of prioritising freight on rail, and expanding motorway capacity without thinking about how to manage probable induced traffic and land use impacts.

CHALLENGES “IT’S WHERE EVERYTHING COMES TOGETHER”

Different layers of users compete for the same capacity

- If not effectively managed, capacity not effectively used.
- Trips with a local value add to congestion on a TEN-T (strategic) network if not well planned.
- Because of congestion, strategic value trips start using the network meant for local traffic.

Complex planning of the node

- **Multimodal transfers:** all transport modes are intertwined. You can not separate them and it’s complex to make it all fit together and make transfers smooth.
- Especially challenging - seamless transfers **for freight transportation.**
 - How do you arrange the last mile well?



Cut-through traffic with strategic value
in Beveren, Belgium
(HLN)

Want to know more?

»»» **MODULE 15**

Introduction to Urban Node Challenges

•Overview:

- Urban nodes face significant challenges due to the convergence of various transport modes and user types.
- Effective management is crucial to ensure capacity is utilized efficiently and congestion is minimized.

Competing for Capacity

•Different Layers of Users:

- Local trips, long-distance travel, and freight transport all compete for the same network capacity.
- If not managed effectively, this competition leads to inefficient use of available capacity.

Impact of Poor Planning

•Local Value Trips:

- Local trips can add to congestion on strategic networks like the TEN-T if not well-planned.
- This leads to inefficiencies and delays for both local and long-distance travelers.

•Strategic Value Trips:

- Due to congestion, long-distance and freight trips may divert to networks

intended for local traffic, exacerbating congestion further.

Complex Planning of the Node

•Multimodal Transfers:

- Urban nodes are complex because they involve the integration of multiple transport modes: road, rail, air, and sea.
- Ensuring smooth and efficient transfers between these modes is a significant challenge.
- Particular attention is needed for freight transportation to ensure seamless transfers and minimize delays.

Multimodal Transfer Challenges

•Complex Integration:

- All transport modes are intertwined, making it difficult to separate them without causing disruptions.
- Planning must account for the seamless movement of passengers and goods across different modes.

Last Mile Logistics

•Arranging the Last Mile:

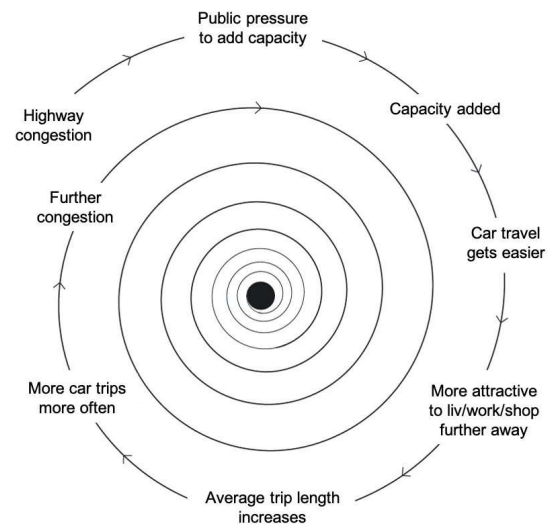
- Ensuring efficient last-mile connectivity is crucial, especially for freight transport.
- The last mile involves moving goods from a transport hub to their final destination, which can be complex and costly.

Module 15 delves deeper into the above concepts.

MORE CAPACITY IS NOT ALWAYS THE ANSWER...

- Investments in new capacity to reduce congestion on the TEN-T network (strategic function) may induce more local value trips and may not therefore solve congestion. (See [Garcia-Lopez et al \(2022\)](#)).

The black hole of highway investment



Bron: D.A. Plane, "Urban transportation: policy alternatives". In: Hanson & Giuliano (red.), The Geography of Urban Transportation (tweede editie), Guilford Press (1995), p. 439.

•Key Message:

- Increasing capacity alone is not a sustainable solution for congestion on the TEN-T network.
- Investments in new capacity can lead to unintended consequences, such as inducing more local value trips, which do not resolve congestion but can exacerbate it.

The Paradox of Capacity Expansion

•Induced Demand:

- When capacity is increased, it often leads to more people using the infrastructure, negating the benefits of the expansion.
- Example: Adding lanes to highways may temporarily reduce congestion but ultimately attract more local traffic, returning congestion levels to their original state.

The Black Hole of Highway Investment

•Concept:

- Continuous investment in highway expansion can be seen as a 'black hole' where resources are consumed without solving the underlying problem.
- Instead of reducing congestion, it can create a cycle of dependence on car travel, leading to more road use and further congestion.

CHALLENGES “IT’S WHERE EVERYTHING COMES TOGETHER”

Governance and financing

- **Don’t define boundaries administratively** instead through ecosystem of actors with common interests and (could/should) cooperate
 - Who is responsible and what is the decision-making process?
 - Often slow and difficult
- **Differentiated priorities** hinder the creation of a common vision
- **Change of political leaders** may cause delays or cancellation of plans
- Because of the complicated governance question, it proves difficult to lock sustainable **funding and financing**
 - How to provide value for taxpayers’ money
 - What are financing options and how do you secure them?



All stakeholders signing the Roadmap 2030 SUMP for the Antwerp region (Antwerps persbureau)

The plan is widely supported and emphasizes the need for intensive cooperation between all parties involved to better manage traffic flows in the Antwerp Transportation Region.

Introduction to Governance and Financing

•Overview:

- Governance and financing are critical aspects of managing urban nodes.
- Effective collaboration among various stakeholders is essential to address these challenges.

Defining Boundaries and Ecosystem of Actors

•Non-Administrative Boundaries:

- Boundaries are not strictly administrative but defined by the ecosystem of actors with shared interests.
- Actors include local governments, transport operators, businesses, and community groups.

•Collaboration:

- Cooperation among these actors is crucial for successful governance and financing.

Governance: Who is Responsible?

•Decision-Making Process:

- Often slow and complex due to the involvement of multiple stakeholders.
- Establishing clear roles and responsibilities is essential for effective governance.

•Challenges:

- Differentiated priorities among stakeholders hinder the creation of a common vision.
- Changes in political leadership can cause delays or cancellations of plans.

Governance Challenges

•Common Vision:

- Differentiated priorities make it difficult to align on a shared vision for urban node development.

•Political Instability:

- Frequent changes in political leadership can disrupt long-term planning and implementation.

Financing Challenges

•Sustainable Funding:

- Securing sustainable funding is challenging due to complex governance structures.
- Difficulty in locking down financing hampers the implementation of long-term projects.

Providing Value for Taxpayers' Money

•Efficiency and Transparency:

- Ensuring efficient use of funds and transparency in spending builds public trust.
- Value for taxpayers' money can be demonstrated through cost-effective and impactful projects.

Financing Options

•Traditional Financing:

- Public funding through government budgets and grants.
- Infrastructure bonds and loans.

•Innovative Financing:

- Public-Private Partnerships (PPPs): Collaboration between public entities and private investors.
- Value Capture Financing: Leveraging the increase in property values due to infrastructure improvements.
- Green Bonds: Funding projects with environmental benefits.

Securing Sustainable Funding

•Strategies:

- Diversify funding sources to reduce reliance on any single stream.
- Engage stakeholders early to build consensus and secure commitments.
- Develop robust business cases to attract investment and justify spending.

•Best Practices:

- Establish clear governance frameworks to provide stability and confidence to

investors.

- Use phased funding approaches to ensure continuous financial support throughout project stages.
- Promote transparency and accountability to maintain public and investor trust.

WHAT WOULD YOU DO ABOUT ONE OF THE MOST IMPORTANT CHALLENGES JUST DESCRIBED?

Group Exercise

- Discuss in groups for 10 minutes.
- All groups will get the instruction sheet.
- Be prepared to report back for 1-2 minutes per group.

What do you think are possible solutions to the challenge of **Local trips, long-distance travel, and freight transport competing for the same network capacity?**

YOU NEED SUMP FOR YOUR FUNCTIONAL CITY

- Reference to **Article 42** of the Regulation – Additional Priorities for Urban Nodes:
 - Focus on key priorities:
 - First/last mile connections between and to access points to TEN-T
 - Seamless connections between TEN-T and regional/local transport (passenger & freight)
 - Adoption of measures to deploy ICT tools and ITS
- Importance of **Annex 5** in terms of Urban Node Obligations to prepare SUMPS:
 - **Goals & Objectives** - Central goal of accessibility of FUA and better performance of TEN-T network
 - **Vision & Implementation Plan** – Long term strategy and integrated approach with spatial planning
 - **Participatory Approach** - co-ordinating different levels of government/agencies
 - **Monitoring & Performance Indicators** (*referring to draft/emerging UMI indicators*)
 - **Integration of Different Modes** – Seamless, sustainable and zero-emission
 - **Effective Functioning of TEN-T** - Impact of urban transport on TEN-T network (congestion, safety issues and bottlenecks)

•Overview:

- Strategic infrastructure elements of an urban node often extend beyond city boundaries.
- Effective planning requires a broader perspective that includes surrounding areas.

Looking Beyond City Borders

•Key Message:

- As a TEN-T node city, it's essential to consider infrastructure and mobility needs beyond local boundaries.
- This includes collaborating with suburban and rural areas to create a cohesive transport strategy.

Importance of Including the FUA

•FUA:

- A should encompass the entire FUA, not just the city.
- This approach leads to more comprehensive and effective solutions for all areas within the urban node's influence.

Benefits of an FUA SUMP

•Comprehensive Solutions:

- Address the mobility needs of urban, suburban, and rural areas collectively.
- Improve connectivity and accessibility across the entire region.

•**Synergies and Efficiency:**

- Enhanced coordination leads to better use of resources and infrastructure.
- Reduces duplication of efforts and optimizes transport services.

Intermodal Passenger Hubs

•**Role of Intermodal Hubs:**

- Serve as physical links between the city and its hinterland.
- Facilitate seamless transfers between different modes of transport, such as buses, trains, and bicycles.

•**Benefits:**

- Improve connectivity and accessibility for residents of suburban and rural areas.
- Enhance the efficiency of the transport network by reducing travel times and congestion.

Example Antwerp:

In 2017, the Antwerp Transport Region was founded, addressing mobility challenges on a broader geographical scale (covering 32 surrounding municipalities) and involving all relevant stakeholders such as the Port and various public transport operators. They all agreed to join forces to accomplish a shared vision on mobility for the whole region. This was one of the first European urban nodes that made a SUMP. This vision was translated into a regional policy and action plan for mobility ('Roadmap 2030').

In the entire Antwerp region, various organisations are already setting up various initiatives that implement the Routeplan 2030:

- **Oosterweel connection:** closing of the Ringroad around Antwerp and extra option to cross the Schelde river. Good example of finding synergy as well. The Ring will partially disappear underground, and in some parts the road will 'disappear' by covering or lowering parts of the Ring. This will allow road traffic to drive underground, creating extra space for parks, playgrounds, cycle paths and more. In places where no coverings are currently planned, green verges will be constructed that will reduce noise and hide the Ring from view. Being implemented.
- **Haventracé:** New road that provides northern alternative around the city of Antwerp that should direct through traffic and port-related traffic around the city as much as possible. Ongoing, research phase
- **Hoppinpunten** (not limited to Antwerp region, but whole Flanders): Developing a network of mobility hubs (interregional, regional, local and neighbourhood hubs). A Hoppin point is a mobility hub where various mobility options come together. You can easily transfer from train, tram, (flex) bus, taxi and shared bicycle, scooter or car to another means of transport. Hoppinpunten are being implemented, ongoing
- **Electrical bike sharing:** Rollout of electric shared bicycles in the region at Park and Rides and train stations, etc. It is the first time that an electric shared bicycle system is rolled out on such a large scale in Flanders (starting with 1650 bicycles). The shared bicycles are an addition to organised public transport. Implemented, ongoing

- **Slim naar Antwerpen:** communication and information for users, support for employers and cooperation with mobility providers. Ongoing.

DEFINE GOVERNANCE FRAMEWORK

- Steps to develop a governance framework
 - **Assessment:** Evaluate the current state and needs of the urban node.
 - **Design:** Create a tailored framework that addresses specific challenges and goals.
 - **Implementation:** Establish the authority and processes for effective governance.
 - Example - Vervoerregio Amsterdam (public transport authority Amsterdam region)
 - **Monitoring and Evaluation:** Continuously assess performance and make necessary adjustments.
- Encourage collaboration through inclusive leadership
 - Horizontal: between adjacent territories
 - Vertical: local – regional – national
 - Inter-sectoral: transport – environment – energy – urban planning - etc



Introduction to Governance Frameworks

•Overview:

- Governance frameworks for urban nodes vary based on the size, maturity, and characteristics of each node.
- The most advanced option is to establish a new authority dedicated to managing transport and mobility.

Establishing a New Authority

•Example: Vervoerregio Amsterdam:

- A transport authority for the Amsterdam region.
- Manages and coordinates transport across 14 municipalities, including Schiphol Airport.

•Benefits:

- Centralized decision-making and coordination.
- Enhanced ability to implement comprehensive transport strategies.

Key Abilities for Effective Mobility Governance

•Impact on Political Decision-Making:

- Ability to influence and shape political decisions to support mobility goals.

•Expertise and Skills:

- Proficiency in designing policies and accessing relevant data.

•**Constructive Stakeholder Relations:**

- Building and maintaining positive relationships with various stakeholders.

Stimulating Collaboration Through Inclusive Leadership

•**Inclusive Leadership:**

- Promotes collaboration across different sectors and levels of governance.

•**Types of Collaboration:**

- **Horizontal:** Cooperation between adjacent territories.
- **Vertical:** Integration across local, regional, and national levels.
- **Inter-sectoral:** Coordination between transport, environment, energy, urban planning, and other sectors.

Example: Vervoerregio Amsterdam

•**Partnership Structure:**

- Includes 14 municipalities in the Amsterdam region.
- Promotes cooperation among municipalities and represents their joint interests.

•**Roles and Responsibilities:**

- Acts as the transport authority for urban and regional public transportation.
- Subsidizes and supervises projects to build and improve infrastructure.

Governance Framework Components

•**Framework Components:**

- Establish clear roles and responsibilities for all involved entities.
- Ensure transparent and accountable decision-making processes.
- Promote active participation from all stakeholders.

Developing a Governance Framework

•**Steps to Develop:**

- **Assessment:** Evaluate the current state and needs of the urban node.
- **Design:** Create a tailored framework that addresses specific challenges and goals.
- **Implementation:** Establish the authority and processes for effective governance.
- **Monitoring and Evaluation:** Continuously assess performance and make necessary adjustments.

Overcoming Challenges

•**Common Challenges:**

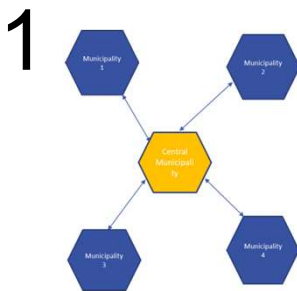
- Differing priorities among stakeholders.
- Political changes impacting continuity.
- Securing sustainable funding.

•**Solutions:**

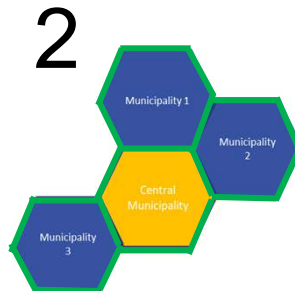
- Foster a common vision through inclusive dialogue.
- Establish robust and adaptable governance structures.
- Diversify funding sources and ensure transparent financial management.

WORKING WITH YOUR NEIGHBOURS – Different situations

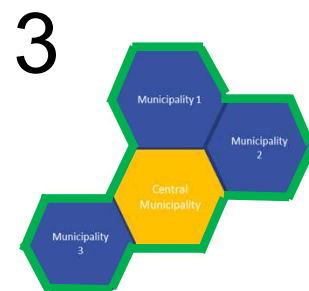
Small city (<50K inhabitants) as a core city with smaller satellite communities at a distance less than 1-hour commuting



Small city (<50K inhabitants) as part of an urban agglomeration yet no Metropolitan Authority



Small city (<50K inhabitants) as part of an urban agglomeration (having boundaries between them) and with different authorities responsible for transport infrastructure and operation (road networks, PT etc)



Cooperation among a small city (<50,000 inhabitants) acting as a core city and its smaller satellite communities within a one-hour commuting distance is crucial for addressing regional mobility challenges effectively. One example of such cooperation is seen in the city of Lund, Sweden, and its surrounding satellite communities like Staffanstorp and Svedala. Lund, with a population of around 90,000, serves as a regional hub with smaller towns and villages situated within a short commuting distance. To improve mobility and connectivity across the region, Lund collaborates closely with these satellite communities to develop integrated transportation networks, shared mobility initiatives, and coordinated land use planning strategies. This collaboration involves joint decision-making processes, resource sharing, and coordination of infrastructure projects to ensure seamless travel experiences for residents and visitors commuting between the core city and its surrounding areas.

A small city (<50,000 inhabitants) is part of an urban agglomeration without a Metropolitan Authority, cooperation during SUMP implementation becomes essential to address shared mobility challenges and ensure coordinated planning efforts across jurisdictional boundaries. One example of such cooperation can be observed in the urban agglomeration comprising cities like Rüsselsheim, Kelsterbach, and Raunheim in Frankfurt's Rhine-Main region. Despite the absence of a centralized Metropolitan Authority, these cities collaborate closely through inter-municipal partnerships and regional planning associations to develop joint mobility strategies and infrastructure projects. Cooperation involves sharing data and expertise, coordinating public transport services, implementing cycling and pedestrian infrastructure, and aligning land use planning initiatives to promote sustainable urban mobility across the agglomeration. By working together, these cities aim to enhance connectivity, reduce congestion, and

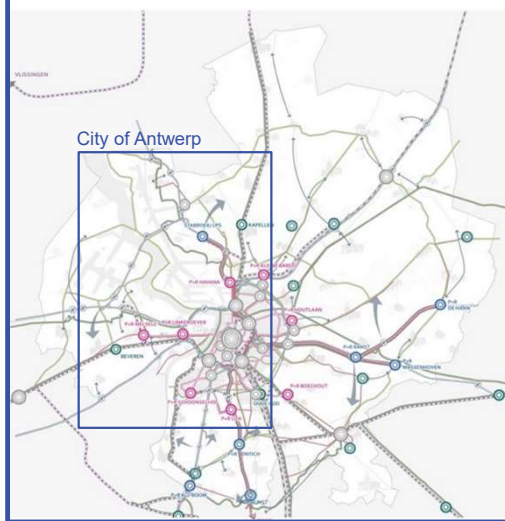
improve the overall quality of life for residents within the urban agglomeration.

In cases where a small city (<50,000 inhabitants) is part of an urban agglomeration with different authorities responsible for transport infrastructure and operations, cooperation during SUMP implementation is vital for addressing mobility challenges effectively and services across the region, including road networks and public transportation, the Greater Manchester Combined Authority (GMCA) serves as a collaborative platform for joint decisions ensuring seamless connectivity across the region. An example of such cooperation can be observed in the Greater Manchester urban agglomeration in the United Kingdom. With multiple local authorities overseeing transport infrastructure planning and coordination of mobility initiatives. Through the GMCA, local authorities work together to develop and implement integrated transport strategies, such as the Bee Network initiative focused on enhancing walking and cycling infrastructure. Additionally, initiatives like the Greater Manchester Transport Fund pool resources and funding to support strategic transport projects aimed at improving connectivity, reducing congestion, and promoting sustainable mobility options across the urban agglomeration. By fostering cooperation among diverse stakeholders, Greater Manchester demonstrates how collaborative governance structures can facilitate effective SUMP implementation in urban agglomerations with decentralized transport authorities.

YOU NEED SUMP FOR YOUR FUNCTIONAL CITY

- Not all strategic infrastructure of an urban node **located within the boundaries of a city**
- TEN-T node cities need to **look beyond your borders**
- FUA needs to be covered by SUMP.
- FUA SUMP give more comprehensive solutions - **benefit both urban, sub-urban and rural areas**
 - intermodal passenger hubs can create physical link between the city and the hinterland of the node.

SUMP Antwerp Region, Roadmap 2030 (2024)



Examples of current projects in Roadmap 2030:

Oosterweel: completion of Antwerp ringroad, and better integration of ring with urban environment (being constructed)

Haventracé: new road as an alternative for through traffic and port-related traffic, around the city (not implemented yet)

Electric bike sharing system for the entire region, as an addition to the public transport

•Overview:

- Strategic infrastructure elements of an urban node often extend beyond city boundaries.
- Effective planning requires a broader perspective that includes surrounding areas.

Looking Beyond City Borders

•Key Message:

- As a TEN-T node city, it's essential to consider infrastructure and mobility needs beyond local boundaries.
- This includes collaborating with suburban and rural areas to create a cohesive transport strategy.

Importance of Including the FUA

•FUA:

- A should encompass the entire FUA, not just the city.
- This approach leads to more comprehensive and effective solutions for all areas within the urban node's influence.

Benefits of an FUA SUMP

•Comprehensive Solutions:

- Address the mobility needs of urban, suburban, and rural areas collectively.
- Improve connectivity and accessibility across the entire region.

•Synergies and Efficiency:

- Enhanced coordination leads to better use of resources and infrastructure.
- Reduces duplication of efforts and optimizes transport services.

Intermodal Passenger Hubs

•Role of Intermodal Hubs:

- Serve as physical links between the city and its hinterland.
- Facilitate seamless transfers between different modes of transport, such as buses, trains, and bicycles.

•Benefits:

- Improve connectivity and accessibility for residents of suburban and rural areas.
- Enhance the efficiency of the transport network by reducing travel times and congestion.

Example Antwerp:

In 2017, the Antwerp Transport Region was founded, addressing mobility challenges on a broader geographical scale (covering 32 surrounding municipalities) and involving all relevant stakeholders such as the Port and various public transport operators. They all agreed to join forces to accomplish a shared vision on mobility for the whole region. This was one of the first European urban nodes that made a SUMP. This vision was translated into a regional policy and action plan for mobility ('Roadmap 2030').

In the entire Antwerp region, various organisations are already setting up various initiatives that implement the Routeplan 2030:

- **Oosterweel connection:** closing of the Ringroad around Antwerp and extra option to cross the Schelde river. Good example of finding synergy as well. The Ring will partially disappear underground, and in some parts the road will 'disappear' by covering or lowering parts of the Ring. This will allow road traffic to drive underground, creating extra space for parks, playgrounds, cycle paths and more. In places where no coverings are currently planned, green verges will be constructed that will reduce noise and hide the Ring from view. Being implemented.
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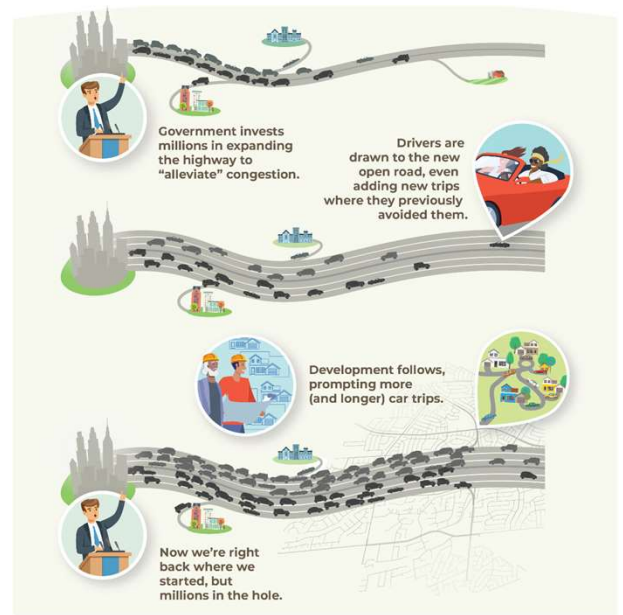
SPATIAL PLANNING AS A TOOL

- Phenomenon of **induced traffic** resulting from expanded capacity can lead to congestion – impact on strategic functions
- Minimize induced traffic from new infrastructure by careful spatial planning
- Plan so that **local traffic doesn't get in the way of strategic traffic** or the other way around

See also **MODULE 17**

Example:

Highways agency (UK) or roads authority (Ireland) introduced policies to prevent development near to new national roads that could impact strategic functionality.



Induced traffic explained (Transportation for America)

Introduction to Spatial Planning

•Overview:

- Spatial planning is crucial in managing the typical pattern of induced traffic that results from expanding infrastructure capacity.
- Effective planning can minimize the negative impacts on strategic infrastructure functions.

The Challenge of Induced Traffic

•Induced Traffic:

- When capacity is expanded, it often leads to increased local traffic.
- This can impact the functionality of infrastructure designed for strategic purposes, such as long-distance and freight travel.

Minimizing Induced Traffic Through Spatial Planning

•Careful Planning:

- Strategic planning can help ensure that local traffic does not interfere with strategic traffic, and vice versa.
- This involves designing infrastructure and land use in a way that segregates different types of traffic or optimizes their integration.
- In addition, experience in Netherlands has shown that controlling sprawl around new high-speed road interchanges limits induced traffic and ensures that capacity enhancements on the road are more likely to be used by strategic traffic.

Planning Strategies

•Key Strategies:

- Zoning regulations that prevent inappropriate development near strategic infrastructure.
- Designing road networks that provide clear, efficient routes for both local and strategic traffic.
- Implementing policies to control access and manage traffic flow effectively.

Example Policies

•Case Study: UK and Ireland:

- Highways Agency (UK) and Roads Authority (Ireland) have introduced policies to prevent inappropriate development near new national roads.
- These policies aim to preserve the strategic functionality of these roads and avoid congestion from local traffic.

Benefits of Spatial Planning

•Functionality:

- Maintains the efficiency and reliability of strategic infrastructure.

•Safety:

- Reduces the risk of accidents by minimizing traffic conflicts.

•Sustainability:

- Promotes sustainable land use and transport planning by considering long-term impacts.

Implementing Spatial Planning

•Steps to Implementation:

- **Assessment:** Evaluate current and future traffic patterns and land use.
- **Policy Development:** Create policies that support strategic infrastructure goals.
- **Coordination:** Work with local and regional authorities to ensure policies are integrated into broader planning efforts.
- **Monitoring and Adjustment:** Continuously monitor the impact of policies and adjust as necessary.

Overcoming Challenges

•Common Challenges:

- Resistance from local developers and communities.
- Balancing short-term economic gains with long-term strategic goals.
- Ensuring coordination among various stakeholders.

•Solutions:

- Engage stakeholders early in the planning process.
- Educate the public and developers about the long-term benefits of spatial planning.

- Establish clear governance structures to facilitate coordination.

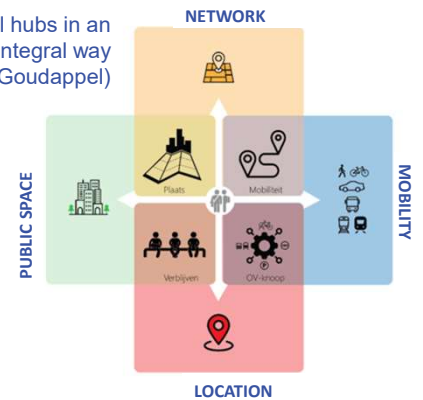
CREATE SYNERGY

- As much as possible **look for opportunities** and synergy with stakeholders.
 - how can we help each other reach our goals?
- Finding synergies between strategic and local value trips, between freight and passenger travel, **reduces costs for everyone involved.**
- **Integrate multimodal hubs** into urban environment.
 - Look at the hub from two levels: network level and location level
 - Add two perspectives when designing the hub: mobility and public space

Rotterdam railway station (Goudappel)



Designing multimodal hubs in an integral way (Goudappel)



Total reconstruction of Rotterdam Railway Station (2014)

- handle the increasing traffic of trains such as the high-speed train (strategic) between Amsterdam, Brussels and Paris, and to accommodate the RandstadRail (local).
- seamless transfers between modes was one of the key design challenges – more platforms added to cope.
- develop a central urban area where people like to stay and in which a 'local' mix of local and 'global' companies and institutions.

Look at the multimodal hub from 2 scale levels:

- The network level: in what way is the hub a link in a regional and national context?
- The location level: how does the hub function in its location?

In addition, there are two perspectives:

- Mobility: a multimodal hub arises from a cross-linking of various mobility flows. Examine which movements the multimodal hub facilitates.
- Space: the hub is part of the public space. Examine what role the node plays in the environment and what influence it has on it.

The scale levels and perspectives together form the context for four themes in the development of a multimodal hub:

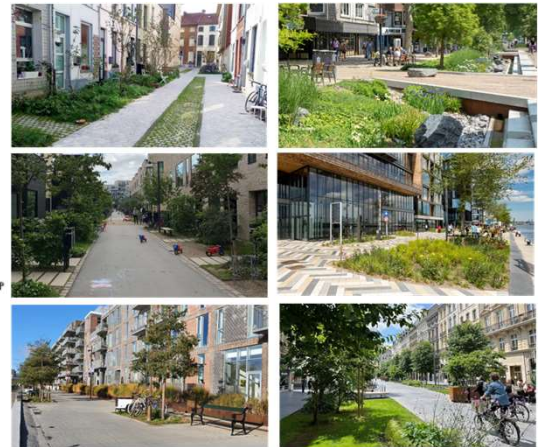
- Place: what role does the hub play in the urban context?
- Mobility: what is the accessibility of the hub?
- Hub: does the hub functionally answer the needs of the traveler?
- Experience: how is the hub experienced by the user?
- These issues are also covered in Module 17 on spatial planning.

- In Rotterdam more platforms were added to the station but access was also improved to the metro and a new higher capacity tram stop was built immediately adjacent to the station as shown in the photo

INTERMODAL HUBS AS DRIVERS OF SUSTAINABLE URBAN GROWTH

How can hub planning stimulate urban regeneration and attract investment in green infrastructure?

- Promoting public transport
- Encouraging active transport
- Integration of smart technologies
- Urban centre of interest businesses, services



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- **Slim naar Antwerpen:** communication and information for users, support for employers and cooperation with mobility providers. Ongoing.

PRICING AS A TOOL

Gothenburg congestion tax scheme

Time of day	Tax
00:00 – 05:59	0 SEK
06:00 – 06:29	9 SEK
06:30 – 06:59	16 SEK
07:00 – 07:59	22 SEK
08:00 – 08:29	16 SEK
08:30 – 14:59	9 SEK
15:00 – 15:29	16 SEK
15:30 – 16:59	22 SEK
17:00 – 17:59	16 SEK
18:00 – 18:29	9 SEK
18:30 – 23:59	0 SEK

- Pricing – tool to ensure **function of the network coincides with the usage of the network**.
- Many variations : time based, distance based, single point toll, dynamic, ...
- Not limited to road pricing

Some examples:

- Congestion tax during fixed hours for vehicles driving into and out of central **Gothenburg, SE**.
- Congestion tax on highway that is time and distance based in **Toronto, Canada**.
- Passengers get a discount when traveling by train outside peak hours **Netherlands**.



Toronto congestion tax zones

•Overview:

- Pricing mechanisms can be used to align the function of the transport network with its usage.
- Various pricing strategies help manage demand, reduce congestion, and optimize the use of infrastructure.

Variations of Pricing Strategies

•Types of Pricing:

- **Time-Based:** Charges vary depending on the time of day.
- **Distance-Based:** Charges are based on the distance traveled.
- **Single Point Toll:** A fixed charge at a specific point.
- **Dynamic Pricing:** Prices change based on real-time demand and traffic conditions.

Beyond Road Pricing

•Other Applications:

- Pricing strategies are not limited to road networks.
- They can be applied to public transport, parking, and other transport-related services.

Example 1: Gothenburg Congestion Tax

•Gothenburg, Sweden:

- A congestion tax is charged during fixed hours for vehicles entering and

exiting the central area.

- Aims to reduce traffic congestion and improve air quality in the city center.

Example 2: Toronto Highway Pricing

•Toronto, Canada:

- A congestion tax on highways that is both time and distance-based.
- Charges vary depending on the time of day and the distance traveled on the highway.
- Helps manage peak hour traffic and encourages off-peak travel.

Example 3: Netherlands Train Discounts

•Netherlands:

- Passengers receive discounts for traveling by train outside of peak hours.
- Encourages the use of public transport during less busy times, reducing peak-hour congestion.

Benefits of Pricing Strategies

•Demand Management:

- Helps distribute travel demand more evenly throughout the day.

•Revenue Generation:

- Generates funds that can be reinvested into transport infrastructure and services.

•Environmental Benefits:

- Reduces emissions by decreasing congestion and promoting the use of public transport.

Implementing Pricing Strategies

•Steps to Implementation:

- **Assessment:** Evaluate current traffic patterns and identify congestion points.
- **Design:** Develop a pricing model that suits the specific needs of the area.
- **Technology:** Implement the necessary technology for monitoring and collecting charges.
- **Public Communication:** Inform the public about the benefits and details of the pricing scheme.
- **Monitoring and Adjustment:** Continuously monitor the impact and adjust pricing as necessary.

Overcoming Challenges

•Public Acceptance:

- Engage with the public early and often to explain the benefits and address concerns.

•Equity Concerns:

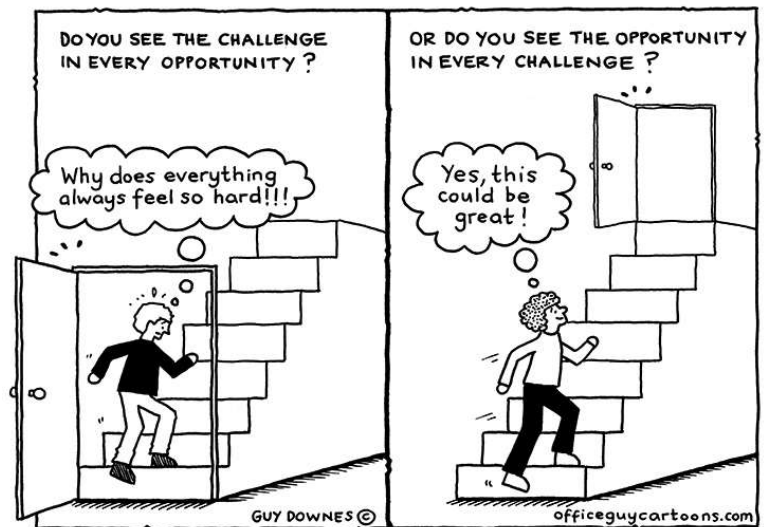
- Ensure that pricing schemes do not disproportionately impact low-income individuals.

•**Compliance and Enforcement:**

- Implement robust systems for monitoring compliance and enforcing penalties for violations.

OUR FINAL MESSAGES TO YOU

- **Provide infrastructure** to enable the strategic transport network to permeate and transit the urban area
- Implement policies to **match the function** and usage of networks
- Start setting up a **governance framework**, it asks for a lot of effort, but it will pay off in the long term.
- Planning urban nodes is complex and comes with many **challenges, but also many opportunities**:
 - Reach local goals by seeking synergy with goals on a high scale level



Infrastructure for Strategic Transport Networks

•Key Message:

- Ensure that infrastructure supports the strategic transport network to permeate and transit urban areas effectively.

•Action Points:

- Develop and maintain robust transport infrastructure to facilitate seamless connections.
- Focus on integrating various transport modes for efficient movement of people and goods.

Matching Function and Usage of Networks

•Key Message:

- Implement policies that align the function of transport networks with their actual usage.

•Action Points:

- Use pricing strategies, zoning laws, and traffic management techniques to optimize network usage.
- Regularly assess and adjust policies to respond to changing travel patterns and demands.

Establishing a Governance Framework

•Key Message:

- Setting up a governance framework requires significant effort but yields long-term benefits.

•**Action Points:**

- Define clear roles and responsibilities for all stakeholders involved.
- Promote collaboration and coordination across different levels of government and sectors.
- Establish transparent decision-making processes and ensure accountability.

Complexity and Opportunities in Planning Urban Nodes

•**Key Message:**

- Planning urban nodes is complex and challenging, but it also presents numerous opportunities.

•**Action Points:**

- Embrace the complexity by seeking innovative solutions and leveraging best practices.
- Engage stakeholders from the beginning to build consensus and ensure successful implementation.

Achieving Local and Higher-Level Goals

•**Key Message:**

- Reach local goals by finding synergies with goals at a higher scale level.

•**Action Points:**

- Align local transport and urban planning objectives with regional and national strategies.
- Use integrated planning approaches to address both local and broader-scale challenges.
- Foster partnerships that support shared goals and facilitate resource sharing.