VITAL NODES

Synthesis document for nodes 1-18 including grouping of solutions

Deliverable 2.4

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Table of contents

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 769458

Document Control Page

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Executive Summary

This deliverable 2.4 follows deliverable 2.3.

This deliverable contains the analysis of the appraisal results of the WP 3 and WP 4 workshops (Tier 1 and 2). The dead line of this deliverable leads to the fact that appraisal results have been based on the workshops which has been conducted up to the 8th of February 2019.

The results are grouped, particularly focussed on urban logistics and long-distance freight, to ensure node-specific relevance of solutions. Node-specifications are based on the fingerprint which has been made per node (together with the node representatives participating in the work sessions). Good practices have been gathered per node, as well as good practices and key notes have been discussed in the workshops. For the format of workshops see deliverable D3.2, for methodology see also deliverable D 2.1.

The assessed, validated and grouped solutions of WP 2 provide input for WP5 to define general and group-of-node level recommendations on efficient and sustainable solutions for improving integrating urban nodes with TEN-T corridors based on grouping of solutions and their impacts. As D2.2 (overview of solutions and their impact) has been finalized in M9 of the project, grouped solutions after M9 will be added in the toolbox (D3.5). This anchors the required and fluent input for WP5.

Note:

The minutes / results of the workshop in Venlo on the 8th of February, with urban nodes Antwerp, Bilbao, Cologne, Piraeus, Sofia, Tallinn and Venlo have not been validated by the stakeholders yet. Therefore, we do not attach these non-validated confidential minutes from the three break- out sessions in the Venlo session, separately. Due to the yet confidential status. The validation of these minutes with the participating stakeholders goes over the deadline period of this deliverable and will be available for the European Commission after validation of the minutes.

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1. Introduction

Vital Nodes has carried out and is still carrying out various workshops with urban node cities across Europe (the 1-18 urban nodes of tier 1 and tier 2) as part of work packages 2, 3 and 4, which are closely related to each other. In deliverable D3.3 the outcomes of the tier 1 workshops are discussed in the form of *recommendations* to the EC (NB: D3.1 was issued earlier and provided the preliminary outcomes for the first urban node Vienna). In deliverable D2.2 an overview of good practices and their (potential) impacts is given – which could be coined as a '*catalogue' of solutions and their impacts*. These practices are based upon desk research, elaboration and validation before – in and after workshops in the first 8+1 nodes (tier 1) as well as on Polis and Eurocities conferences / focus groups. The deliverable D2.3 has provided a synthesis: it grouped the solutions captured in the (desk) research phase regarding the tier 1 urban nodes. This grouping enabled to provide communalities between solutions, and to derive therefrom good practices and advice.

In order to understand D 2.4, it is required to understand D2.1, D 2.2 and D3.2 including the challenges / info graphics / finger prints containing information on the WP3 and WP4 workshops.

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2. Synthesis

The grouping criteria are based on the synthesis of communalities between:

- the **challenges** they tackle
- and the (potential) **impacts** of these solutions.

An important conclusion – which came out of the tier 1 workshops and which is an explicit result of the tier 2 workshops too - is that an urban node has a wide functional (urban) area when it comes to logistics.

i. Challenges

Between urban nodes, challenges might vary. In some cases, the environmental (e.g. air quality) norms are not met, meaning that there is a vast and urgent challenge. Where in other cases ambitions for the environmental performance (e.g. emission targets) are set meaning there is a local positive driver behind the challenge. A challenge might derive from an urgent issue, others from an ambition.

Similarities in challenges between urban nodes are distilled from analyses and based on the tier 1 and tier 2 workshops (see also D3.3, D2.2, D4.2 and the separately attached confidential yet not validated minutes of the working sessions with urban nodes on the 8th of February 2019). Challenges vary with the type of urban node:

- A cross-border node is confronted with additional difficulties related to institutional and governance aspects in comparison to a national (inland) node;
- A poly-centric node (e.g. linking more urban centres to one urban node) has additional difficulties related to governance and investment aspects in comparison to a centric node (e.g. linking one urban area to one node);
- A node which has implemented solutions with an inter-relation between scales and/or with the inter-relation between transport and spatial planning differs in impact from a node that has implemented standalone solutions (without an inter-relation between scales and / or without the inter-relation with spatial planning and transport);
- A node which has – from a logistics perspective - an inbound or local consumption function in relation to the corridor, has different challenges than a node which has an outbound / production/transit function. The latter has different impacts on for example value capturing.

The common challenges of urban nodes to which the solutions mapped in D2.2 are connected/related are as follows:

The definition of TEN-T corridors is narrow, function of urban nodes unclear
The narrow definition of TEN-T corridors does not fully reflect the importance and challenges of regional or local freight transport networks. The corridors only relate to long-distance transport services having diverting challenges than urbanized areas. Infrastructure provision is only a minor aspect of the solutions in urbanized areas. The management, optimization and curbing of flows is of great importance. The bottlenecks are seen in the cities, e.g. a congested ring road, while the solution might be found on the corridor (e.g. stimulating multi-modality) or vice versa.

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Data collection on urban aspects is a challenge
The collection of basic and advanced data on urbanized areas is a challenge. It is difficult to gain insight in the local service networks and intensity of transport of regional and urban logistics. When data is available, it is often only proxy data and comparability between urbanized regions is uncertain. The Daily Urban System (DUS) and Functional Urban Area (FUA) both do not reflect data on NUTS levels, among others because they do not match the exact same area.

Limited alignment of regulations
The local curbing of mobility and transport, e.g. via low emission zones or (differentiated) access restrictions, is not harmonized within Member States or across the EU. The coordination of constructions along the corridors, impacting the urban nodes, (e.g. maintenance) has to be optimized. E.g. there is a difference between Rhine and Danube. For the Rhine the Rhine Commission does much coordinative work, for the Danube this is lacking, which is limiting transportation via the river.

Robustness of the network (in urban nodes) depends on solutions elsewhere
There is a need for regional collaboration on urban node-specific issues related to freight transport. The regional aspect of challenges complicates the implementation of successful solutions. In addition, this also works the other way around. Improvements in the network at the corridor may cause extra traffic, which may result in new bottlenecks within urban nodes

Innovation in solutions and in implementing changes is a challenge
Implementing solutions or pilot projects proves to be difficult. This may benefit from triple helix (university – industry – government) collaborations. Piloting innovations in field labs/living labs (based on local drivers for development) is proven to be successful in many urban areas. Key is the involvement of private logistic agents.

Growing cities and scarcities of space
Almost all solutions are confronted with lack of (urban) space. The majority of urban areas see an increase in number of residents and economic activity. As a consequence, space is scarce, and is often used to accommodate demand for more housing first. Many urban areas redevelop former logistics areas into residential areas, further pressuring availability of urban space for logistics and mobility. While especially the implementation of larger solutions, e.g. Urban Consolidation Centers (UCCs), multi modal terminals or brownfield re-developments demand considerable amount of space. Implementing these solutions have to take scarcity of space into account as a complicating factor. However, planning and governance, e.g. the stimulation of multiple use of terrains and the reservation of areas within the city for logistic activities, can stimulate innovative approaches (see also D3.1).

Social acceptance and inclusion
The awareness raising (e.g. being an urban node and the impact and necessity of logistics activities) is of importance to create acceptance for the implementation of solutions. It is a challenge to convince local stakeholders (including citizens) to be open to logistic sites close to or in urbanized areas, especially when not having a direct link to urban logistic demand.

The effects of transport flows on vitality / liveability and social economic consequences is not only negative. The presence of dense and well-developed networks of freight transport offer opportunities too for enhancing vitality and social inclusion of deprived neighbourhoods. Distribution of freight locally is profiting of scale advantages, the activities themselves provide labour market demand and the building of sites too.

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Improvement of knowledge exchange
The sharing of good practices and open discussion on common issues can be improved. The challenges of urbanized areas are quite alike. The solutions, tested or implemented, differ quite a lot. A regular exchange of urban nodes on the TEN-T network, e.g. in a setting where comparable cities meet, could lead to efficiency and creativity in finding and implementing solutions.

Attention needed for logistics-oriented development
Cities and regional governments need to pay more attention to logistics in spatial development(s) too. Some developed and implemented freight transport measures. Many implement mobility measures, only indirectly influencing freight transport. Stimulating explicit attention for freight and logistics in SUMPs and other local policies is vital. Especially when developing residential areas or brownfields.

Challenge of funding more integrated solutions
Funding by a single party of more integrated solutions (either public or private) proves to be limited. There are possibilities for multi-donor funding and a combination of smaller projects in one investment. The increased complexity makes probability of failures larger.

ii. Grouping of Solutions

The solutions, described in D2.2 and which will be added in the toolbox (D3.5), have very different origins and scope. Some are very local, some regional. Some are tested on a very small scale, other lead to large infrastructure developments. Some are implemented, others are in the development phase. The clustering of solutions on common aspects will allow to come up with good practices and lessons learned.

Considering the complexity of the challenges there is no silver bullet. A focus on innovative technical solutions/methods will not be enough. As already indicated in the Vital Nodes proposal and which will be further elaborated in D3.5, there is need for an integrated approach that connects the world of infrastructure, mobility, freight, logistics with the world of urban and spatial development. This has been confirmed in the tier 1 and tier 2 workshops (see D3.3 and D4.2). An approach, in which there is attention for soft innovations addressing the multiplicity of the challenges by integrating not only different spatial scales but also different sectors, modalities, stakeholders and multi-level governance. The challenges in integrating freight logistics of urban nodes into network corridors have a multi-dimensional character. Not only network issues of the (freight logistic) transport and mobility system needs to be considered, but also spatial issues related to urban vitality (socio-economic development, spatial and environmental quality and liveability), as well as issues of short-term and long-term development, value creation and capturing issues, multi-level governance and institutional issues, and issues related to implementation have to be addressed.

In D3.4 a first preliminary version (‘mark 1’), outlining the Vital Nodes ‘toolbox-under-construction’ has been discussed, which is based on the experiences gained with Networking for Urban Vitality (NUVit) and enriched with the first experiences gained Vital Nodes urban node workshops. Six dimensions have been distinguished:

- Network dimension, regarding infrastructures and terminals, multi-modal optimization, various spatial scales, and which explicitly regards freight logistics;
- Spatial dimension, regarding spatial concepts, synergy on accessibility;
- Time dimension, regarding time linkages between short-term and long-term, strategy development;

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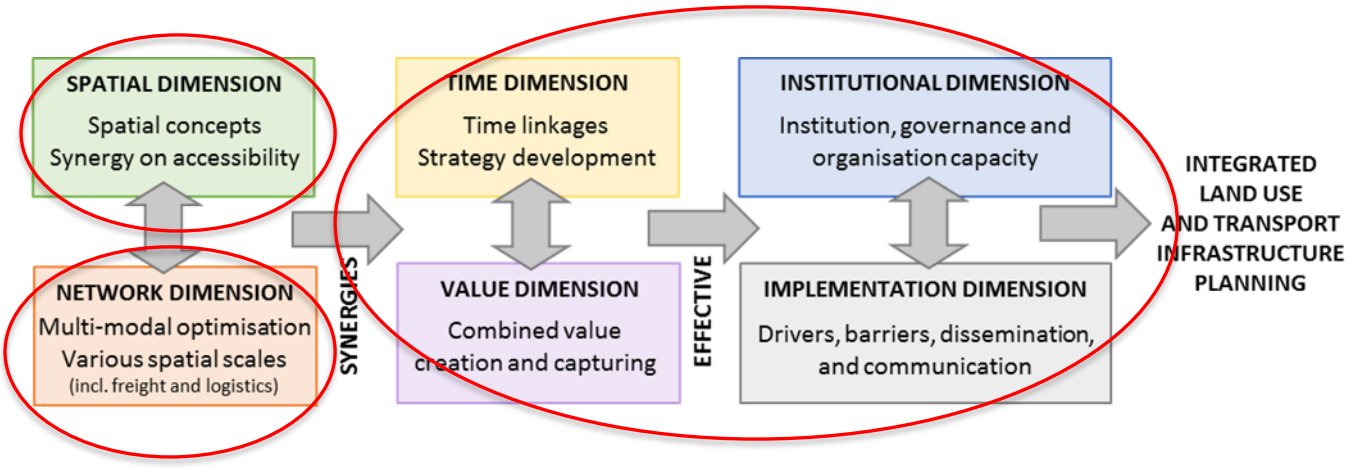
- Value dimension, regarding value creation, assessment and capturing of (combined) development;
- Institutional dimension, regarding institutional arrangements, (multi-level) governance, organizational capacity;
- Implementation dimension, regarding drivers, barriers, dissemination and communication.

Figure 2. Linkages between various dimensions (see also D3.4).



The experiences gained suggest that the various dimensions are related in a logical way (see Figure above and D3.4). The spatial and network dimensions regard the linkages between transport infrastructure, mobility and land-use. Resulting in potential synergies that needs to be considered at which the time and value dimensions are relevant. Finally, this requires an adequate institutional and implementation approach to become effective integrative planning. Therefore, transport infrastructure can be carefully coordinated with spatial developments resulting in tailor-made solutions to the local situation, enhanced vitality of regions and well-functioning (inter)national transport corridors and networks.

For the grouping of solutions, the results of the tier 1 and tier 2 workshops (see D2.2, D3.3, D4.2 and the attached confidential minutes) suggest that it is useful to elaborate more on the network dimension, while the time, value and implementation dimensions prove to be closely related to the institutional / governance dimension. Regarding the network dimension a further categorization of solutions is proposed that relates principles as described in the FLUXNET study[1], which is closely related to Vital nodes (see also the Vital Nodes proposal).

- As part of the FLUXNET study some 25 good practices have been identified with a broad range of effects on modalities. The following dimensions are suggested to optimize the multi-modal functioning of the spatial infrastructure network and system (terminals, infrastructure and modalities); *Optimize a terminal* stands for improving the internal organization of a

[1] More information might be found at the CEDR website *www.cedr.eu*

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terminal. Existing terminals are re-organized in order to increase the efficiency to better serve multiple modes.

- *Add a terminal* stands for (re-) locating a terminal at a multi modal location in order to improve multi-modality and to improve the network performance.
- *Optimize* (the use of existing, sustainable) infrastructural *systems* means that the use of existing traffic infrastructure (rail, water, road, pipeline) is being optimized by physical or organisational measures.
- *Add infrastructure* stands for realizing a new physical, sustainable transport infrastructure (waterway, railway, pipeline) that complements the existing infrastructure network in order to facilitate a modal shift.
- *Optimize a mode* stands for optimizing the use of an existing vehicle on existing infrastructure with the aim to create an alternative for conventional truck transport on the local / regional / corridor road network
- *Add a mode* stands for adding a new vehicle type to existing infrastructure with the aim to create an alternative for conventional truck transport on the local / regional / corridor road network.

In addition to these categories related to the network dimension, also categories are distinguished related to:

- *Spatial development and planning.* The spatial dimension relates to linking the local and regional, (inter)national transport services in the most optimal way. It regards spatial developments as housing, facilities, business estates, green areas etc, their distribution across a city and region, redeveloping old areas and neighbourhoods (brownfields) as well as (master) planning at local and regional scale. Here small measures at local scale may help to solve bottlenecks at the Daily Urban System and the corridor level ('smart acupuncture').
- *Governance and institutional arrangements* This comprises governance approaches and organizational frameworks at all institutional levels and entails also issues of institutional embedding, governance models as well as issues of the cultural setting, resulting in solutions for inter-governmental cooperation (public-public partnerships), market involvement (public-private partnerships), stakeholder engagement (users, citizens, interest groups), the governance of organizational networks, and smart mixes of these. Governance and institutional arrangements also relate closely to (collaboration) in funding, value capturing, time, implementation etc. (see D3.4).

As a result, a grouping of 8 solutions is proposed:

- *Optimize a terminal*
- *Optimize* (the use of existing, sustainable) infrastructural *systems*
- *Add infrastructure*
- *Optimize a mode*
- *Add a mode*
- *Spatial development and planning*
- *Governance and institutional arrangements*

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This methodology is elaborated in the Tier 2 workshops. This didn't lead to a required enrichment of the methodology.

For insights in the impact of good practices see D 2.2 and D3.5.

iii. Towards a Typology for urban Nodes

Vital Nodes has formulated pre-defined criteria which reflect the relevance of the solutions for specific types of nodes. We have applied these criteria – as a typology – on the Tier 1 nodes and Tier 2 nodes.

The conclusion of the application with the nodes in the Venlo session on the 8th of February, confirms the criteria for the typology. This typology helped to identify and to cluster challenges and potential solutions in dialogue with urban nodes more effectively and efficiently.

The criteria are:

- **Cross border function**
  Yes / No. If it is a cross border node, is it multi-modal (M) or uni-modal (U)?
- **Sea port:**
  Yes / No. If it is a sea port node is it a gateway)(G) or a regional hub (R)?
- **Inland function**
  Yes / No. If the node is inland, is it a small (S) or big (B) node (threshold is 1 million inhabitants or more)?
- **Relation of the node (logistics FUA) and the Corridor**
  U = Urban: inbound focused on local consumption versus
  T = Transit: outbound focused on production and transit of goods
- **Is the node located in a developed (D) or in a cohesion (C) region?**
- **Is the node centric (C) or poly-centric (Pc)?**
  Does the note serve multiple or only one urban area?

The application of the criteria on the Tier 1 nodes is shown in the table below.

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Table 1. Criteria applied on the Tier 1 nodes

	Cross – border: multi or unimodal	Sea: Gateway / regional hub	inland: size: small / big (1 mln or more)	Relation of the node (logistics FUA) and the Corridor (U: inbound / consumption versus T: outbound / production and transit)	Developed / cohesion region	Centric versus poly centric
Vienna	M		B	U	D	C
Rotterdam		G		T	D	Pc
Gothenburg		R		T	D	C
Hamburg		G		u/t	D	C
Budapest			B	U	C	C
Genova		R		T	D	C
Turku		R		T	D	C
Strasbourg	M		S	t/u	D	C
Mannheim			S	T	D	Pc

Note: Empty cell = not applicable

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The application of the criteria on the Tier 2 nodes is shown in the table below.

Table 2. Criteria applied on the Tier 2 nodes

	Cross – border: multi or unimodal	Sea: Gateway / regional hub	inland: size: small / big (1 mln or more)	Relation of the node (logistics FUA) and the Corridor (U: inbound / consumption versus T: outbound / production and transit)	Developed / cohesion region	Centric versus poly centric
Piraeus		G		T	C	C
Sofia			B	U	C	C
Tallinn	Um	R		U	C	C
Antwerp		G		T	D	Pc
Duisburg / Venlo	Mm		S	T	D	Pc
Cologne			B	T	D	Pc
Bilbao	Mm	R	B	T	D	Pc
Ljubljana	Mm		S	U	C	C

Note: Empty cell = not applicable

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