

Validated recommendations for Tier 2 groups of urban nodes

Deliverable 4.2

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D4.2 Validated recommendations for Tier 2 groups of urban nodes

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Abbreviations

CEEC	Central European Countries
CEDR	Conference of European Directors of Roads
CEF	Connecting Europe Facility
ECO	Ecorys
EFSD	European Fund for Strategic Investments
EIM	European Rail and Infrastructure Managers
ERDF	European Regional Development Fund
EU	European Union
EUR	Euro
FUA	Functional Urban Area
O-D	Origin-Destination
OMG	Departement Omgeving Vlaanderen
PPP	Public Private Partnership
PO	Project Officer
RWS	Rijkswaterstaat
STRIA	Strategic Research and Innovation Agenda
SUMP	sustainable urban mobility plan
TEN-T	Trans-European Transport Network
TFK	Trafikverket
UMP	Urban Mobility Package
WP	Work Package



Executive Summary

Urban areas have become an integral part of the development of the TEN-T network, which is reflected in the concept of urban nodes. Annex II of the TEN-T Guidelines lists 88 urban nodes of the core TEN-T network, which were identified based on socio-economic criteria. These urban nodes ensure the connection between the different transport modes, as well as the connection between long-distance and regional, peri-urban and intra-urban freight transport and logistics. The Vital Nodes project contributes to more effective and sustainable integration of urban nodes into TEN-T corridors by innovative solutions for optimising accessibility, liveability and vitality, and to create equal emphasis of development on corridors and nodes.

One of the objectives of the Vital Nodes project is to deliver validated recommendations for a more effective and sustainable integration of the urban nodes into the TEN-T corridors. This deliverable (*D4.2 Validated recommendations for Tier 2 groups of urban nodes*) contributes to this objective by providing information on the validation of the preliminary recommendations, notably in future research and funding needs, which have been presented in Deliverables 5.1/5.3 *Preliminary Recommendations. Preliminary recommendations for future research needs, funding needs and CEF/TEN-T guidelines*. The ambition of the validation process is to test and to upscale the recommendations to all 88 urban nodes.

WP4 follows a stepwise explorative and user-driven approach to validate these recommendations (*Facilitate wide-scale deployment of innovative solutions covering all 88 nodes*), using a workshop model that was elaborated in a first advanced series of workshops with urban nodes (the 8+1 urban nodes of Tier 1 urban nodes – see D3.3). Following this approach, WP4 carried out workshops with a second group of nine urban nodes (Tier 2 urban nodes) represented by 50 urban nodes' stakeholders from across Europe.

The collected input from these Tier 2 workshops forms the source of information for the validation of the preliminary recommendations, i.e. the present document. Based on the interaction with the last and third group of urban nodes (Tier 3 urban nodes) a final validation round will be carried out in the next months leading to the final recommendations. Therefore, the validation is still ongoing, and the results presented here are intermediate.¹ The validation process with Tier 3 urban nodes will be carried out based on the enhanced knowledge on challenges and needs of urban nodes.

This deliverable is following the principle structure of the preliminary recommendations, i.e. regarding (1) future research and (2) funding needs and (3) CEF and TEN-T guidelines. We understand “validation” as a process to approve and deepen the preliminary recommendations. Thus, we enrich and refine the recommendations by adding complementary findings on a broader basis than in Tier 1 and with an escalating involvement of stakeholders, thereby making the recommendations increasingly concrete and broad.

¹ WP2, WP3 and WP4 are closely related, which also makes the deliverables D2.2, D2.3, D3.3 and this deliverable D4.2 strongly related. The preliminary recommendations are based on the above-mentioned WP deliverables, as well as on findings from key events, as included in WP6.



This deliverable presents intermediate results. So far, no obvious contradictions with the existing preliminary recommendations were found. However, additional and refining statements from urban nodes complement the Tier 1-based recommendations, such as “consider a more advanced criteria supported methodology for the distribution of funding”, or “include investments in sustainable urban mobility measures for highly functioning urban nodes/cities”. Some additional topics, such as “assess the impact of online commerce on traffic flows and spatial development on all levels”, or “develop scenarios for climate adaptation in the logistics sector” have been included, and will need further discussion and validation in the following months to further contribute to the final recommendations to the European Commission (via Tier 3 workshops). A final assessment of the validity of the recommendations will be made after consultation of the Tier 3 urban nodes.



1 Importance of urban nodes development for the TEN-T

Transport provides vital functions to the European Union and their cities, enabling economic growth and access to jobs and services. Urban nodes² are crucial for the effectiveness of the core network of the TEN-T (Trans-European Transport Network), as they are the origin and/or destination of most long-distance transport flows³. They host major multimodal transport hubs, and are crucial regarding the interfaces of long distance and last mile delivery. However, freight transport, spatial planning and urban mobility are still mainly conventional shaped worlds, which have not yet been integrated. With an increasing number of inhabitants in combination with ever-growing freight transport volumes, different problems arise in urban nodes, which call for an integrated and innovative approach.

Urban areas have become an integral part of the development of the TEN-T network, which is reflected in the concept of urban nodes. Annex II of the TEN-T Guidelines lists 88 urban nodes⁴, which were identified based on socio-economic criteria, and have played a key role in structuring the TEN-T core network. These urban nodes ensure the connection between the different transport modes, as well as the connection between long-distance and regional, peri-urban and intra-urban freight transport and logistics. With core network corridors acquiring importance as socio-economic environments too⁵, urban nodes play a key role as centres of socio-economic, spatial and technological development.

An effective integration of a node in the TEN-T core network corridors is complex. As each urban node has its own specific characteristics and issues, it would be too simplistic to assume that there is a one-size-fits-all solution. Different spatial scales, modalities, sectors and stakeholders are concerned, and all have to be taken into account when optimising the integration of solutions for accessibility and profitability of freight logistics on the one hand with vitality and liveability of urban areas becoming increasingly important on the other. As freight transport and urban logistics grow and innovate swiftly, and increasingly impact socio-economic development, as well as accessibility and spatial and environmental quality of urban regions, there is a need for deliberate, governmental involvement. In view of these developments, infrastructure planning, urban planning, and passenger and freight transport must become more integrated to effectively and sustainably incorporate urban nodes into TEN-T corridors⁶. To this end, actors within various fields, such as urban planners, infrastructure coordinators and operators, freight and logistic operators and financiers, need to collaborate early on in the planning

² Definition 'urban node', EU 1315/2013, Article 3

³ COM 2011/0650 final, COD 2011/0294

⁴ See: <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32013R1315> Annex II List of Nodes and the Core Comprehensive Networks.

⁵ See, e.g.: DG Internal policies (2013), TEN-T Large Projects – investments and costs, Policy Department B, Structural and Cohesion Policies, Brussels. [http://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/495838/IPOL-TRAN_ET\(2013\)495838_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/495838/IPOL-TRAN_ET(2013)495838_EN.pdf); Dijkstra, L. (ed.) (2014), Sixth Report on economic, social and territorial cohesion, European Commission, Brussels. http://ec.europa.eu/regional_policy/sources/docoffic/official/reports/cohesion6/6cr_en.pdf; and See Balázs, P., L.J Brinkhorst, P. Cox, M. Grosch, K. Peijs, C. Trautmann, P. Wojciechowski (2016), TEN-T Corridors: Forerunners of a forward-looking European Transport System, Issue papers of European coordinators, 12 May 2016, Brussels.

⁶ See: Arts, J., T. Hanekamp & A. Dijkstra (2014), "Integrating land-use and transport infrastructure planning: towards adaptive and sustainable transport infrastructure", *Proceedings 5th TRA Conference 14-17 April 2014 Paris*, IFSTARR, Paris.



and decision-making process. This allows for a more integrated perspective at investments in mobility, infrastructure, passenger transport and freight logistics from (inter)national (corridor), regional and local perspectives.

This means that there is need for a combination of TEN-T related goals and the objectives of sustainable urban mobility plans (SUMP)⁷, as promoted by the Commission in the 2013 Urban Mobility Package (UMP)⁸. Within this framework, these goals open the perspective for forward-looking practices and integrated approaches, which both enhance transport solutions and stimulate synergies with other urban functions⁹. Regarding the complexity of the challenges there is no ‘silver bullet’. A focus on innovative technical solutions and methods will not be enough. There is need for an integrated approach that connects the world of infrastructure, mobility, freight, and logistics with the world of urban and spatial development. An approach in which there is attention for soft innovations, addressing the multiplicity of the challenges by integrating different spatial scales, sectors, modalities, stakeholders and multi-level governance. This need for integration is acknowledged by key stakeholders such as National and Regional Infrastructure Authorities¹⁰, DG MOVE¹¹, as well as the Coordinators of the TEN-T corridors, who stress the importance of integrated strategies, platforms for exchanging experiences and a multi-level governance approach.

Besides the above-mentioned challenges, the urban nodes cope with a variety of challenges (see also Deliverables 2.3 and 3.3), such as: Increasing congestion and costs,¹² intensifying climate change impact,¹³ growing health impact related to poor air quality,¹⁴ higher number of road accidents,¹⁵ as well as inefficient use of space¹⁶.

⁷ See: <http://www.eltis.org/mobility-plans/sump-concept>

⁸ See: https://ec.europa.eu/transport/sites/transport/files/themes/urban/urban_mobility/doc/apum_state_of_play.pdf, and https://ec.europa.eu/transport/sites/transport/files/themes/urban/urban_mobility/doc/2009_urban_mobility_leaflet_en.pdf

⁹ See Balázs, P., L.J Brinkhorst, P. Cox, M. Grosch, K. Peijs, C. Trautmann, P. Wojciechowski (2016), TEN-T Corridors: Forerunners of a forward-looking European Transport System, Issue papers of European coordinators, 12 May 2016, Brussels

¹⁰ Covering the relevant modes of transport.

¹¹ See presentations of S. Phillips (SG CEDR), L. Erixon DG Trafiverket - SE), J.H. Dronkers (DG Rijkswaterstaat, NL) and D. Rosca (DG MOVE) given at the EU Conference on “Networking for Urban Vitality, An integrated approach on Infrastructure and Spatial Planning”, EU Symposium – organized as part of the Netherlands’ EU-Presidency – 23 June 2016, Amsterdam – www.nuvit.eu

¹² COM (2011) 144 final, 13 Increase of 50% of costs by congestion in 2050

¹³ See: https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1509035065.pdf

¹⁴ COM (2011) 144 final, 30 Urban transport is responsible for 25% of CO2 emissions.

¹⁵ COM (2011) 144 final, 30 69% of all road accidents occur in cities.

¹⁶ See: https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1509035065.pdf



2 Aim and outreach of Vital Nodes

The Vital Nodes project contributes to more effective and sustainable integration of urban nodes into TEN-T corridors¹⁷ by innovative solutions for optimising accessibility, liveability and vitality, and to create equal emphasis on corridors and nodes.

Against the above-mentioned challenges, objectives of the Vital Nodes project have been defined, which are two-fold:

1. To deliver validated recommendations for a more effective and sustainable integration of all 88 urban nodes into the TEN-T corridors, focusing on freight logistics;
2. To establish a long-lasting European expert network, based on existing (inter)national and regional networks for safeguarding long-term continuity in knowledge and implementation.

In relation to the first objective, the Vital Nodes project will contribute with evidence-based recommendations for the further implementation and deployment of innovative approaches. These recommendations address a more (cost-) efficient and sustainable integration of long-distance and last-mile freight delivery and logistics in urban areas, also considering passenger transport flows. Vital Nodes will collect best practices, experiences and opportunities, as well as deploying novel combinations of existing technologies and services.

The goal of WP4 (*Facilitate wide-scale deployment of innovative solutions covering all 88 nodes*) is to reach out to all urban nodes and to initiate a bottom-up and a discussion process among urban nodes representatives. This dialogue aims to push sustainable freight transport planning in urban nodes higher up on the agenda by acknowledging the multiple challenges and the specific and complex environment. There is a need for trade and international goods transport in Europe, but European policy also pursues ambitious climate goals¹⁸, and considers healthy and liveable cities important¹⁹. Freight transport flow is predicted to increase on every level of the TEN-T – on the local, regional, national and corridor scale. At the same time, freight is a highly competitive environment and public policy has difficulties of addressing this area effectively. Therefore, it is urgent to better integrate urban nodes into planning for sustainable freight transport and to raise awareness about the prominent role of urban nodes on all levels – as well as encouraging urban node stakeholders to become more proactive.

WP4 reaches out to planners in urban nodes, infrastructure coordinators and operators, freight and logistics operators, or funding specialists in mobility, infrastructure, passenger transport, freight and logistics to discuss local challenges, projects, ideas and specifically the needs in the urban nodes. In dedicated workshops WP4 has the task to initiate discussions and to facilitate networking among all urban nodes of the TEN-T following a stepwise-approach.

¹⁷ Since 2013, the European Union's trans-European transport network policy disposes of core network corridors – an instrument that combines the benefits of a coherent infrastructure development across national borders and transport modes, of a future-oriented transport policy and of a strong governance structure with each other

¹⁸ Commission communication on a policy framework for climate and energy from 2020 to 2030 - COM(2014) 0015

¹⁹ European Commission (2013): Together towards competitive and resource-efficient urban mobility / Urban Mobility Package.



The WP4 exchange process is (1) foremost used to receive qualified feedback on challenges and needs and to provide the European Commission with feedback on TEN-T and CEF-guidelines as well as funding and innovation needs. (2) Outreach activities are also used to contribute to the creation of a bottom-up network of practitioners and experts on the topic of sustainable freight planning on the local, regional, national and TEN-T scale. Another target (3) is to improve knowledge and evidence by collecting data and information from urban nodes on challenges and visions, ideas, strategies and solutions and their impact. Thus, WP4 is also supposed to contribute to the WP3 Vital Nodes toolbox²⁰.

3 Validation concept and structure of this deliverable

This deliverable contributes to the first of the two above-mentioned Vital Nodes objectives by supporting the development of recommendations addressed to the European Commission on how to stimulate the sustainable integration of urban nodes in TEN-T and how to increase the effectiveness of the core network of the TEN-T.

The deliverable presented here is an interim result of Work Package (WP) 4 (*Facilitate wide-scale deployment of innovative solutions covering all 88 nodes*) and provides important input for WP 5 (*Validated recommendations on integrating nodes and corridors, on funding needs and instruments, and on future research needs*), which aims to provide validated recommendations on integrating nodes and corridors, on funding needs and instruments, and on future research needs. In D5.1²¹, preliminary recommendations were presented which are the objective of the validation process.

However, the validation process carried out so far cannot (yet) determine the validity of the preliminary recommendations. Rather, we understand validation as a process to approve and deepen the preliminary recommendations, to improve the knowledge base on urban nodes by including additional aspects in the findings on a broader basis and with the increasing involvement of stakeholders. These, in turn, should serve to derive additional and more concrete recommendations. At this point, however, no claim can be made to completeness or representativeness, as the process of validation is still ongoing and is intended to be finalised by the consultation of Tier 3 urban nodes stakeholders in the next step. Therefore, validation results are still intermediate.

Another aspect is that even though WP4 workshops have tried to involve a wide range of stakeholders (see appendix, Participants of meetings with Tier 2 urban nodes), a description of the specific situation

²⁰ D3.5 (Final VitalNodes Toolbox, based upon experiences gained with Tiers 1, 2 and 3) (based on D3.4 (Preliminary VitalNodes Toolbox, based upon experiences gained with the pilot case Vienna)) will add appraised good practices from Tier 2 and Tier 3 as well as the validated finger prints from Tier 2. This validation has not yet carried out.

²¹ Further description of the recommendations is given in D5.1, which integrates the deliverables D5.1 and D5.3 as these two deliverables are closely related. Recommendations for the new CEF and TEN-T guidelines (deliverable D5.3) are closely connected with recommendations on funding and future research needs (deliverable D5.1) and vice versa.



and needs of an urban node inevitably remains selective as performance and planning of an urban node is influenced by a great variety of stakeholders, of whom only a sub-set could get involved.

A further methodological caveat should be raised about the context of tier 2 interaction in WP4: While in-depth communication with Tier 1 urban nodes was organized in intensive specialized workshops, WP4 has planned to involve a much higher number of stakeholders, contributions of tier 2 urban nodes, therefore, are provided in a different format. Additionally, the group of Tier 2 urban nodes is more diverse in experience and awareness than Tier 1 urban nodes, which were selected on the basis of both high expertise and awareness. Some tier 2 nodes also have fewer resources and planning capacities available than most tier 1 nodes.

In all workshops, we followed an explorative and user-driven bottom-up approach using the preliminary recommendations as an orientation for the feedback and dialogue process with Tier 2 urban nodes. The guiding question was which challenges are perceived by the urban nodes and which needs are identified by them for further nodal development.

The structure of this deliverable is as follows: We present the Vital Nodes transferability concept (*D4.1 Vital Nodes transferability, outreach and node-integration strategy. Knowledge exchange concept, operational cooperation and integration plans*) and our rationale for adopting it during the course of our work in WP4. The background for this adaptation and its implementation is explained. Then intermediate validation results are presented on the basis of the structure of the preliminary recommendations, which are (1) future research needs, (2) future funding needs and (3) the further development of CEF and TEN-T guidelines.

The presentation of results closely follows the feedback received from urban nodes representatives. We have summarised the workshop discussions about challenges, strategies and solutions, as well as needs without providing any judgement, e.g. on relevance, representativeness or feasibility. In order to illustrate the points made, we have provided (anonymised) quotes from stakeholders.²² After each section a summary is presented that highlights any obvious discrepancies with the existing preliminary recommendations, adds complementary aspects,²³ and indicates specific topics for future discussion in WP4 workshops. The final assessment of the validity of the recommendations will be made after consultation of Tier 3 urban nodes, as planned.

²² In italic

²³ At that time, this was feasible for future reasearch needs and needs to be finalised for the other two building blocks in the next validation round.



4 The validation processes

In this section, the first phase of the outreach process with Tier 2 urban nodes is described. Vital Nodes developed a transferability concept (*D4.1 Vital Nodes transferability, outreach and node-integration strategy*). Based on first interaction with Tier 2 urban nodes and lessons learnt, the concept has been adapted to improve effectiveness of the outreach and to increase the involvement of Tier 2 urban nodes representatives. The background for this adaptation and its implementation has been reported in relevant progress report, but is presented here, as this represents an additional result that needs to be considered in Tier 3 urban nodes involvement.

4.1 Transferability concept

Vital Nodes follows a gradual outreach approach (see Figure 1). The project's stepwise deployment began with a pilot case in Vienna, which has served as test bed. Then, the procedure was further tested and fine-tuned through its application on eight advanced urban nodes (Tier 1²⁴). After the experiences with individual urban nodes in Tier 1 (1+8 urban nodes), the application should be extended to a total of 18 urban nodes (Tier 2) and finally to cover all 88 Urban Nodes of the Core Network (Tier 3).

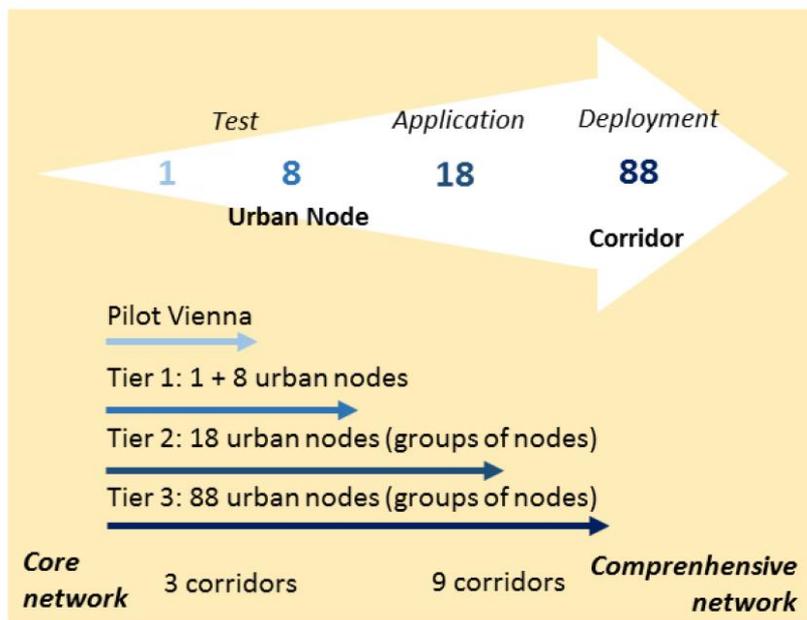


Figure 1: Vital Nodes' Stepwise deployment approach

On that basis nine urban nodes were selected for Tier 2. This list of nine nodes has been approved by the Project Officer (PO)²⁵.

²⁴ Vienna, Rotterdam, Gothenburg, Budapest, Hamburg, Genoa, Turku, Strasbourg, Mannheim.

²⁵ Copenhagen, Antwerp, Tallinn, Bratislava, Valencia, Sofia, Gdansk/Gdynia, Piraeus, Duisburg/Venlo

The aim in the selection of Tier 2 was to ensure sufficient variation of urban nodes in terms of context conditions and, therefore, challenges and needs. Besides a geographical coverage and the representativeness of urban nodes located in cohesion countries, also urban nodes profile variables have determined the selection.²⁶ To this end WP2 formulated pre-defined criteria which reflect the relevance of the solutions for specific types of nodes.²⁷ These criteria were applied to Tier 1 nodes and were also proposed for Tier 2 nodes. This typology was supposed to help identify and cluster challenges and potential solutions as well to group urban nodes for workshops.

The seven criteria are:

1. Cross border function: Is it a cross border node, is it multi-modal or uni-modal.
2. Sea port: Sea port node and gateway or a regional hub.
3. Inland function: The node is inland, small or big (threshold is 1 million inhabitants or more).
4. Relation of the node (logistics FUA) and the Corridor: inbound focused on local consumption versus outbound focused on production and transit of goods.
5. The node is located in a developed or in a cohesion region.
6. The node is centric or poly-centric.
7. The node serves multiple or only one urban area.

The operational concept for Tier 2 foresaw to carry out three workshops consisting of two to three urban nodes. This was planned to be preceded by a grouping process of clustering the selected urban nodes according to the seven criteria above. In addition, the specific interests of the urban nodes in the grouping needed to be considered. For the purposes of interest analysis and pre-grouping, bilateral dialogues with the selected urban nodes were established and a webinar and an online survey were conducted. Practical considerations had to be evaluated regarding the time resources and availability of the stakeholders. The original planning also stipulated that all Tier 2 workshops should take place in one of the selected urban nodes and thus assume the role of hosts.

A variety of obstacles arose in the engagement process of Tier 2 urban nodes. This has eventually led to an adjusted approach (see **Fout! Verwijzingsbron niet gevonden.**). Despite an intensive communication with node representatives, the interest in the planned engagement activities and the grouping process was unsatisfactory: (1) Three of the twelve selected urban nodes were not responsive, despite repeated contact attempts, two urban nodes declined immediately.²⁸ (2) The attempt of grouping nodes according to the seven criteria as a means of identifying workshop topics was seen critically by the contacted nodes representatives, and (3) interest in hosting larger workshops was generally low, despite the support and financial contributions from Vital Nodes. This has led to severe delays in timing, unsatisfactory recruitment of nodes representatives and hosts - despite high efforts in WP4.

Based on our discussion with nodes representatives, we have identified several obstacles that made it difficult to follow through our initial engagement concept. However, these points also indicate structural issues that need to be borne in mind in future engagement and networking activities of urban nodes in Europe:

²⁶ On request of the PO also two nodes (Venlo and Duisburg) of the comprehensive network have been taken up in the list. Due to the strong regional relation the two nodal nodes could be seen as one test case.

²⁷ See for more details on the urban node typology D2.3 Synthesis document for nodes 1 + 8 including grouping of solutions.

²⁸ It was agreed with the consortium to start contacting two urban nodes from the reserve list. Both urban nodes were not-responsive.



(1) Urban nodes represent a very high diversity in awareness of TEN-T. This is much higher in tier 2 nodes than in tier 1 and will be even higher in tier 3. Our main contact persons are working in urban planning or transport planning departments, who (exceptionally) may have a high level of awareness about the role of their node as one of the 88 TEN-T nodes, and, consequently, very different awareness of the potential added value of getting engaged in the Vital Nodes project. For those (few) highly experienced nodes, the added value of Vital Nodes is limited, because they have more specialised and advanced means of networking already available. The majority of contacted urban nodes representatives, however, has a rather limited awareness of the strategic need of EU-level engagement. Both, high and low level of awareness lead to reluctance, or difficult to fulfil expectations towards an engagement in Vital Nodes.

(2) The institutional readiness in many nodes must be considered as weak, making it difficult to identify the key stakeholders, get consolidated responses on key questions, or good practice solutions. In most of the nodes there are explicit and clear responsibilities for nodal development. This then contributes to problem of authorization within a hierarchical administration structure. In some governance systems, the 'urban node' concept is also considered more as a national than a local issue.

(3) Freight transport poses a specific difficulty, as there is a often low level of (regulatory) competence – despite a widely felt high problem pressure. Freight transport and logistics are seen as problematic areas of public policy making by many urban node representatives that we were in contact with. The concept of integrating planning for freight transport and urban and passenger mobility is not prevalent even though it is considered an important planning topic.

4.1 Adjusted outreach concept

In consideration of those reasons, and in order to fulfil Vital Nodes' project obligations of reaching out to nine tier 2 urban nodes within a very limited time period, we developed a more flexible approach for recruiting node representatives, for the workshop approach and workshop topic selection. In brief, we agreed that WP4 applies flexibility towards more mixed meeting formats (more in line with urban node expectations and local needs) and to set aside the pre-defined grouping process on the basis of the seven analytical criteria. On this basis we organised tier 2 urban nodes' outreach activities as bilateral workshops, as well as group workshops 'by-invitation-only'. Workshop topics were chosen on the basis of the specific feedback we received from intensive bilateral exchanges with urban nodes representatives, in order to focus on topics that are perceived to be relevant for a wide range of stakeholders. We also more strongly considered the integration of the passenger transport perspective whenever applicable, even if our focus remains on freight transport and logistics.

Based on this adapted concept, the required nine urban nodes were successfully integrated into the outreach process. Although there are deviations from the originally pursued list of urban nodes, all nodes involved contributed intensively to the dialogue. So far, one large workshop (in Venlo at the beginning of February) and three workshops each in the urban nodes (Sofia, Duisburg, Ljubljana) have been carried out very successfully. The different steps of the validation process including the workshops is presented



in Table 4.1. Overall, 50 urban nodes representatives have been involved personally in the face-face outreach process²⁹.

Table 4.1 Activities of the validation process

Action	Involved parties	Period
Drafting of the transferability concept (D4.1)	Rupprecht Consult & WP2, WP3 & WP5 Vital Nodes experts	M6-7
Webinar for Tier 2 urban nodes	Urban Nodes: Antwerp, Venlo, Duisburg, Sofia, Bilbao; WP5, WP3 & WP2 Vital Nodes experts	M11
Bilateral contacts with Tier 2 urban nodes representatives	Tier 2 urban nodes, Rupprecht Consult	M8-M14
Online survey with Tier 2 urban nodes about challenges and solutions and preferred grouping	Tier 2 urban nodes, Rupprecht Consult	M12-M13
Discussion on status of outreach concept at GA	Vital Nodes consortium	M13
Project meeting in Utrecht about adjustment of outreach concept	Rupprecht Consult & WP2, WP3 & WP5 Vital Nodes experts	M14
Workshop with Tier 2 urban node Sofia	Rupprecht Consult; Sofia urban nodes representatives	M15
Workshop with Tier 2 node Duisburg	Rupprecht Consult, Duisburg node representatives	M16
Workshop with seven Tier 2 urban nodes in Venlo	Urban Nodes: Antwerp, Venlo, Cologne, Sofia, Piraeus, Bilbao, Tallin; WP4, WP3, WP2 & WP1 Vital Nodes experts	M16
Workshop with Tier 2 urban node Ljubljana	Rupprecht Consult, Eurovienna, Ljubljana node representatives	M16

In all workshops, we have followed an explorative and user-driven approach. We used the preliminary recommendations as a general structure and orientation for the investigation to identify the principle needs for further node development. At all events Vital Nodes was presented as well as the intermediate results of the project analyses. This concerns in particular the results from the Tier 1 workshops as well as the compilation and evaluation of the solutions in the Tier 1 urban nodes. The aim was to set the basis for a long-term interest in the 'urban node' approach and TEN-T generally, to understand concerns/needs and to a trigger creative exchange process among stakeholders. Urban nodes stakeholders were always encouraged to present their own strategies and solutions. This successfully created a good basis for discussions about needs for a more efficient nodal development. To facilitate discussions, urban

²⁹ We would like to thank the participating representatives of the nine nodes Antwerp, Bilbao, Cologne, Duisburg, Ljubljana, Piraeus, Tallin, Sofia and Venlo for their active participation in our events and their willingness to engage in dialogue and discussions, as well as for the valuable hints, which should help to improve the knowledge base and the integration of the urban nodes in the TEN-T. Participants lists of all meetings are presented in the appendix.



nodes fingerprints that had been prepared for the nodes in the Venlo workshop were used throughout the discussion process.³⁰

In the workshops we have tried to create a structured and open, trustful working atmosphere, which has allowed everyone to speak freely and openly on their local conditions, especially their challenges. All meetings with the urban nodes' representatives took place in a highly concentrated and motivated atmosphere, which is also due to the very good preparation and contribution of all involved consortium partners. All discussions and dialogues of the workshops were thoroughly documented. These results have been categorized and thematically clustered. Within these clusters, stated challenges and needs of urban nodes are highlighted and tentative consequences for action have been formulated – and are reported in this document.

In the following chapters the results of the validation process carried out in the outreach process are presented. In the beginning of each chapter the preliminary recommendations are shown in an overview table to give a summary about the different aspects formulated for each building block. Afterwards, the results of the validation process are described, differentiated into different topics and formulated needs based on workshop documentations. After each building block, a short summary provides an assessment of contradictions and additions to the present recommendations. We also identify topics that should be particularly focused on in the future and whether additional recommendations might have to be included. This analytical process will be further elaborated in the validation round with Tier 3 urban nodes. The last chapter focusses on lessons learnt from Tier 2 engagement for the involvement of Tier 3 urban nodes, which will be carried out in the next few months and result in D4.3 (Validated Recommendations for Tier 3 groups of urban nodes) by the end of June 2019.

³⁰ The concept of the fingerprint is fully described in D2.1 Appraisal methodology and guidelines on its application for workshops (as integrated part of the methodology).



5 Intermediate validation of future research needs

Urban areas are key elements of the TEN-T network and must respond to growing mobility needs and increasing freight transport by implementing new logistic concepts, ensuring transport modes’ seamless interconnection and accommodate spatial-economic growth and urban expansion (housing, working, recreation, facilities). Efficient freight delivery across the nodes into the last-mile is crucial for urban vitality (regarding social, economic and environmental quality of life). Urban areas must also tackle social and environmental issues, such as urban/peri-urban congestion, poor air quality, noise exposure, and road safety. All of this is key to ensuring a more sustainable development of Europe's urban areas and, at the same time, ensure that urban areas properly support the implementation and intelligent use of the European transport network³¹.

To support the sustainable development of urban nodes as part of the TEN-T network, it has been identified that more intensive and dedicated research is needed. The following table presents nine Vital Nodes preliminary recommendations on future research derived from interaction with a first and advanced groups of urban nodes complemented by the assessment of other experts and stakeholders.³²

Table 5.1 Preliminary recommended future research needs

Preliminary recommended future research needs	Context and background
1. Determine the potential and benefits of integrated solutions	The aim is to improve cross-sectoral and cross-disciplinary cooperation between urban planning, infrastructure, mobility and environment. Therefore, further research should focus on a broad range of topics, which includes finance, environmental impact, mobility, economic, liveability and timing issues of integrated projects, which consists of soft measures, and urban (infrastructure) projects.
2. Design of optimal datasets for traffic flows (passenger and freight).	For decision making about multimodal traffic flows, related measures and corresponding funding it is crucial to come to a common understanding and description of an urban node and to structure data and information collection and to be able to compare the different urban nodes among each other.
3. Innovative potential of urban nodes in first and last mile delivery.	It is important to reduce freight transport movements and its negative impacts. Therefore, it is necessary to develop test cases and living labs based on local drivers for development to investigate the effects of different innovations. The use of triple helix collaboration (Knowledge Institutes-Government-Private

³¹ See: Arts, J., T. Hanekamp, R. Linssen & J. Snippe (2016), “Benchmarking Integrated Infrastructure Planning Across Europe – Moving Forward to Vital Infrastructure Networks and Urban Regions”, *Transportation Research Procedia*, Vol.14 (2016), pp. 303-312.

³² E.g. Vital Nodes consortium, Advisory Board, Experts, TEN-T coordinators, European Investment Bank (EIB).



	Parties) needs to be stimulated to maximise the results of innovation.
4. Explore new forms and innovative types of governance	There is a need to explore which form of governance could support an integrated approach, which contribute and accelerate the integration of the urban nodes on the TEN-T network.
5. Interrelation between infrastructure, multimodal mobility management and spatial planning	Research is needed on how to shape inter- and multimodal hubs in and around urban nodes and how to implement the multimodal hubs in such a way that it has a positive impact on environment (air, noise), liveability and congestion and that the effects are also visible outside the boundaries of the urban nodes on the TEN-T network.
6. Resilience of the multimodal urban network.	It is not only the location, scale and design of the hub, but also the transport volumes from and to a hub which is important. Further research is necessary what forms of mobility should be considered to increase interlinkages between the various networks of different modalities so that the resilience of the overall urban network will enhance.
7. Position and linkages between different urban nodes on the TEN-T network.	Cross-border collaborations have many economic benefits for both cities / urban nodes, but because of differences in legislation, permits, etc., the economic possibilities are often not fully utilised and can be strengthened. Further research is needed to determine in which areas cross-border cooperation between urban nodes is most needed, which economic potentials this can have, and which barriers must be removed.
8. Functioning of the TEN-T network and the role the hubs play in relation with the New Silk Road.	At this moment there is partly not enough rail capacity in and around urban areas. Planning at local and national level is necessary towards the creation of new inland ports to handle new freight flows. The New Silk Road developments and potential impacts needs to be linked to the local/regional topics, such as the vulnerability of the railway network.
9. Include an Area of Work for Urban Infrastructure in Strategic Transport and Research and Innovation Agenda (STRIA)	The (STRIA) points 'Infrastructure' as one of the seven priority areas. <i>Urban</i> infrastructure (which also considers spatial planning and governance) is missing and should be added.

5.1 Need for better integration and cooperation

All tier 2 workshop participants agree that there is an explicit necessity to explore models and methods for cross-sectoral and multilevel approaches to transit and freight planning on the regional and corridor scale. **This supports recommendation 1 - Determine the potential and benefits of integrated solutions.** However, the question how the private sector can be involved in cross-sectoral solutions on different scales on the TEN-T is of additional interest, and was raised by all node representatives.



“We should explore models and methods for multilevel metropolitan approaches to transit / freight planning. How can the private sector be addressed, what are cooperation models for integrated projects? What are win-win conditions of private companies in the freight sector?”³³

The conditions for participation of private companies in integrated solutions in the freight sector should be explored, but also in the passenger transport sector, e.g. for synergies between passenger and freight transport. A careful analysis of risks, benefits, barriers to transnational or cross-border implementation of such projects is considered relevant.

Furthermore, investigation of integrated solutions and their estimated impacts should be extended to sustainable shipping on node and corridor level.

As well, there is a need to develop preconditions and methodologies for data-based planning, especially for multimodal hub development, including the relevant datasets and requirements for stakeholder coordination. This adds more aspects to **recommendation 1**, but also to **recommendation 5 - explore the Interrelation between infrastructure, multimodal mobility management and spatial planning**, and was raised by the urban nodes from the cohesion countries.

5.2 Need for data and data-sharing

There are several suggestions from Tier-2 urban nodes which **facilitate recommendation 2 - design of optimal datasets for traffic flows**. Thus, there is a high need to determine optimal datasets for traffic flows in both passenger and freight transport.

“We need data for policy-making about origin and destination, traffic distribution, loading in order to come to a better data-based planning of infrastructure.”

However, there is an important additional recommendation coming from the urban nodes with core infrastructure on the complementary network: To establish indicators which help determine whether a node is highly functioning in terms of traffic flows or nodal functions on the TEN-T or not, to be able to attribute funding accordingly.

“TEN-T as a concept seems to be as pencil-drawn corridors with respect to passenger transport rather than freight transport. Look at the corridor from a freight perspective at all levels.”

It is considered one research need to analyse which segments on the corridors are actually affected by which cargo streams.

“Analyze the effects of potential and actual shifts of supply-chains on the TEN-T, follow the freight!”

Furthermore, it is suggested by a majority of consulted nodes to design suitable data sets that are relevant for data-based policy-making, spatial infrastructure and traffic planning on several levels, as well as quality control of freight-transport. As well, participants from cohesion countries suggested to establish datasets for modelling of freight in SUMP and planning intermodal terminals. Further usages would be to analyse the possible impact of goods on supply chains or routes in terms of disaster control,

³³ The quotes presented in this section originate from the 50 consulted stakeholders. In line with project methodology, and as agreed at every stakeholder meeting, they are anonymized in this public document.

safety or environment protection, also for traffic management measures (suggest "safe routes" in routing tools and apps).

Another aim would be to analyse the effects of shifts in supply chains on the TEN-T. To achieve this, it is necessary to track traffic flows and goods on the local, metropolitan, national and TEN-T level. Relevant datasets would enable planners to look at the corridor from a freight perspective on all levels, and to analyse which segments on the corridors are actually affected by which cargo streams. This recommendation came from a large majority of consulted urban nodes stakeholders.

An important requirement for the establishment of optimal datasets is data-sharing. However, since many logistic operators are private companies, the private sector still needs to be convinced to share commercial data. All urban nodes representatives agreed that cooperation models are needed that create trust by reaching win-win situations and offer a relevant basis for data-sharing.

5.3 Need for innovations in first and last mile delivery

All participants of Tier2 workshops agree on the **innovative potential of urban nodes in first and last mile delivery**, and thus, **support recommendation 3**. Nodes representatives - both advanced and inexperienced - in the application of artificial intelligence (AI) solutions - refine this recommendation by suggesting nodal labs examining the different effects of AI solutions for last-mile delivery and self-driving technology in urban nodes, also to determine legal preconditions for transferability to other Member States. Another living lab suggestion is to explore and test public-private cooperation models and support schemes for sharing e.g. capacity, energy supply or to generally address sustainable urban logistics and safety issues. The last suggestion comes from all participants of the Venlo workshop.

5.4 Need for new types of governance

It is suggested by all consulted urban nodes to explore and develop bottom-up governance models for the TEN-T corridors and for the metropolitan areas of urban nodes, thereby **supporting recommendation 4 - explore new forms and innovative types of governance**. There is an explicit need for strategies to advance multiregional and multilevel cooperation and policy approaches in polycentric systems. As well, there should be a set of common policies and objectives for Functional Urban Areas (FUAs). Especially participants from cohesion countries ask for ways to better integrate policy and sectoral goals into comprehensive project proposals.

“Stimulate the elaboration of governance models to bring stakeholders on the regional level together, such as public Transport, companies, government layers.”

5.5 Need for better cross-border strategies and operation

Especially the representatives from urban nodes with cross-border function and with inland-ports **maintain recommendation 7 – position and linkages between different urban nodes on the TEN-T**. There is huge potential in increasing and facilitating cross-border infrastructure operations, which are perceived too costly and complicated at present. It is suggested to examine the obstacles and potential of synergies between freight and passenger transport. As well as, the legal and infrastructural preconditions for cross-border cooperation e.g. for green energy supply for all freight modes, including shipping, should be explored and developed.



5.6 Need to create a resilient multimodal network

The consulted urban nodes representatives agreed that there is a need to design methodologies to develop vulnerability scenarios in relation to the impact of a range of external factors on traffic flows, urban development and safety. However, we also need these scenarios on the regional and TEN-T level, not only on the urban level. These external factors are online commerce, transport of dangerous goods and climate change. This adds new aspects to **recommendation 6 – resilience of the multimodal urban network**.

“The resilience of nodal infrastructure against floods, earthquakes and dangerous goods is an issue in many nodes. It is necessary to have data on goods so that routes can be adapted in case of bottlenecks.”

As well, some urban nodes suggest observing and analyse Chinese investments and the development of the New Silk Road, which is currently seen as major threat for the planned network and corridor development as well as for FUA which are directly affected by transport and logistics flows. There is a need for more facts and analysis to assess impacts on the infrastructural and economic development as well as related opportunities. This adds a new item to **recommendation 8 - functioning of the TEN-T network and the role the hubs play in relation with the New Silk Road**.

5.7 Summary of the intermediate validation process for future research needs

Preliminary recommendations for future research needs have been consolidated, specified and enriched by integrating the perspective of the Tier 2 urban nodes. Additional aspects have also been mentioned for further elaboration, which are the following:

Assess the impact of online commerce on traffic flows and spatial development on all levels

The urban nodes workshop participants in Venlo agreed that there is a need to analyse the impact of online commerce on urban and regional development, urban mobility, space consumption, congestion, traffic, goods flow and local economy on every level of the TEN-T. They stated that it is important to develop scenarios and guidelines for planners on all levels of the corridor.

“Online commerce by Amazon, Alibaba etc. will increase, they build delivery centres and road transport is massively affected, congestion will increase in cities, and it is important to assess its impact and prepare for it.”

Develop scenarios for climate adaptation in the logistics sector

As well, it is seen as important to develop scenarios for climate adaptation in the freight sector, including shipping, and to develop strategies for sustainable logistics. This was mainly brought up by an inland port node in a polycentric region which is not only affected by general climate change risks such as heat or heavy rainfalls, but also by decreasing water lines on the Rhine.

Analysis of infrastructural needs for energy transition in freight on the TEN-T



An internodal analysis of infrastructure needs for a coordinated sustainable and regenerative energy supply in the freight (waterway, railway and road) sector is required, with particular consideration of cross-border regions.

“We need more support for transnational green logistics on the Rhine: e.g. cargo load structures are influenced by propulsion technologies and need to be coordinated among the nodes. We also need help from the EU to coordinate the Rhine corridor and to assist with the planning.”

6 Intermediate validation of future funding needs

Vital Nodes sees investment needs to improve the sustainable integration of urban nodes at local, national and TEN-T level. Maximising the potential of funding stream (Connecting Europe Facility, European Structural and Investment Funds, European Fund for Strategic Investment) and private co-funding) should ensure urban nodes are able to meet current and future challenges providing innovative, smart, efficient and sustainable transport. Following an integrated approach of projects and governance for urban node development these projects will cover a variety of different topics, for example, improvement of the air quality, economic growth and increasing liveability, which benefits a group of stakeholders. To increase this integrated approach, financing from different European funds would be beneficial.

The following table presents the three preliminary Vital Nodes recommendations on future funding needs derived from interaction with a first and advanced groups of urban nodes complemented by the assessment of other experts and stakeholders.

Table 6.1 Future funding needs

Preliminary recommended future funding needs	Context and background
1. Complexity and liveability issues of urban nodes in TEN-T project development.	There is a constant risk that investments create new bottlenecks, environmental and social issues. Funding should be set apart for mitigating measures or even alternative investments, that might give the same results as the planned TEN-T investment.
2. Integrated governance as key element for successful urban nodes.	European funding should set an incentive for cooperation at metropolitan scale (regional SUMP) as the focus should be on the functional transport and economic relations between urban centres and the surrounding urban territories (Functional Urban Area (FUA)).
3. Better integration of different types of EU funding, including CEF grants.	20% of CEF-funding should be reserved for investments in infrastructure, mobility, spatial and environmental measures enhancing the integration of urban nodes on the TEN-T network;



	<p>investments that focus on the peri-urban networks (where long-distance inter-urban and short-distance intra-urban mobility meet), on intra-urban networks in economic core areas (strengthen agglomeration effects, conform 'borrowed size') and on coordination with spatial development in order to strengthen the socio-economic benefits (creation of multiplier effects) of EU funding investments that enhance integrated spatial and multimodal transport development and that increase coherent development of innovation, sustainability and liveability.</p>
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6.1 Need to improve sustainability of logistic hubs

The workshop discussions show that Tier-2 representatives agree with **recommendation 1 - Complexity and liveability issues of urban nodes in TEN-T project development**. It is stressed by representatives of urban nodes that there is a range of secondary effects coming from freight traffic that highly functioning nodes suffer from. The emergence of logistic hubs has led to additional traffic, and often, the freight flows cross urban centres and residential neighbourhoods, lead to bottlenecks and high emission of air pollutants or noise. As well, interfacial capacities between long-distance and/or local redistribution in the nodes are often not sufficient.

Logistic hubs are important for the nodes, but they also bring major disadvantages, such as surface consumption compared to a relatively low quantity of jobs. High-functioning nodes do not have enough resources to make up for these disadvantages, especially on the health and urban mobility side. Urban nodes that are connected to ports are particularly affected, because the emergence of logistic hubs has led to additional traffic.

“All transport modes cross the city, and all freight goes through the city. There is a big need for infrastructure measures to address bottlenecks, especially in view of increasing freight volumes.”

“Freight trucks enter the city-centre, there are bottlenecks of 4 km on the way to the port.”

“The two last miles between the highway and the port are the real problem because freight transport crosses the city and residential areas. Here, we have a high stress level. As well, the connection to the supra-regional network is problematic.”

Additional funding for these high-functioning nodes should aim at facilitating sustainable urban mobility.

“We need additional funding sustainable urban mobility measures for logistic hubs. Until now, we compete for funding with cities that are not logistic hubs, but we are suffering from the structural disadvantages of being a logistic hub.”

6.2 Need for investment in railway development

As well, prioritised investment in soft measures in high-functioning nodes is seen as necessary, such as institutional capacity-building for sustainable mobility and logistics planning on the urban and metropolitan level. It is suggested to further investigate giving priority to railway development, especially in the cohesion countries, and to also support the development of highspeed train connections which are still missing in Eastern Europe (CEEC). This is adding another factor to **recommendation 1 - Complexity and liveability issues of urban nodes in TEN-T project development.**

The current state of railway infrastructure in CEEC slows down freight transport on the corridors and in the nodes and will continue to do so without making it a priority. There is a great need for new railway infrastructure, including reconstruction and redevelopment. Railway competes with highway construction, which is often preferred due to lower initial costs and lobbying, whereas the societal benefits of railway infrastructure (lower emissions, health, urban sprawl...) is ignored.

Old, not maintained, infrastructure, insufficient service and software, missing real-time data and communication problems with national levels also delay the development of modern intermodal railway hubs. This creates bottlenecks in the nodes, which is rather concerning in view of expected increasing freight volumes in the near future.

“Railway is not reliable for freight.”

“The bad shape of the railway system is hindering the TEN-T development in the node and on the corridor.”

Separation of freight and passenger in rail transport is considered urgent to take the pressure from the road, also to make railway an attractive alternative for commuters. It is also suggested to invest in soft measures on existing railway infrastructure, such as the improvement and revitalisation of railway station surroundings and services to increase the attractiveness and to establish economic (sub-)centres.

6.3 Need for coherent approaches to get access to funding

The promotion of integrated governance on the metropolitan / FUA level is welcomed by all Tier 2 workshop participants. There is a great need for horizontal and vertical institutional and cross-sector governance to develop e.g. national strategies for freight, or to develop and implement intermodal terminals. Such an approach would help to develop and implement large infrastructure projects. Therefore, it is suggested to make an integrated and coherent approach for developing and implementing big infrastructure projects a requirement for funding. This maintains **recommendation 2 - Integrated governance as key element for successful urban nodes.**

“Not only funding is missing, but also a coherent approach of developing and implement big infrastructure projects. There is a great need for institutional and cross-sector / cross-level



governance cooperation to develop and implement mobility projects. Stakeholder coordination and cooperation is a major problem.”

“There is a great need for a national strategy on intermodal logistics that links the right logistics to the hubs. As well, we are working without It would be helpful if EU could make a coherent approach of developing and implementing big infrastructure projects a requirement.”

In addition to that, it is more appropriate to think along the supply and logistic chains and in regional connections when developing projects and less focussing on transport infrastructure/flows. For example, an inland port node stresses that cargo load on the Rhine are influenced by propulsion technologies, and there should be information-exchange between nodes about infrastructure needs and project coordination on segments of corridors and / or on the whole TEN-T corridors.

6.4 Need for incentives to strengthen public-private cooperation

Another additional point for **recommendation 2 - Integrated governance as key element for successful urban nodes** is to set incentives not only for public-public integrated governance, but to include incentives for public-private and private-private cooperation schemes on the regional ("transit regions") and node level. This point represents a major conclusion from the Venlo workshop and is supported by all participants. Since the freight sector is dominated by private interests, it is important to develop policy goals on the local and FUA level that create win-win situations for the public and private sector, whereas contributing to the general public interest.

“Freight means private sector.”

“The recommendation is to talk to the private stakeholders, they have so much knowledge, this is crucial to understand the supply chains on every level and how they work.”

This would mean that the public sector initiates, moderates and supports coalitions of private stakeholders in order to solve capacity problems, e.g. with innovative logistic concepts for capacity sharing, or to provide innovative solutions for access to clean energy for freight. Here, the public sector can provide financial incentives, data and administrative help or infrastructure, and use the knowledge of logistic operators and private companies to understand supply chains on every level.

“Let us support cooperation between the public and the private sector, they can develop innovative logistic concepts for capacity sharing, for example to make the delivery in the city-centre more sustainable.”

“The idea behind this is to let the market find solutions for capacity problems.”

The public sector should also be encouraged to include private stakeholders into new or existing SUMP processes on the level of the regions/urban node/FUA. Such cooperation schemes would also contribute to build trust with the private sector - an important condition for the provision and sharing of data.



6.5 Need for more targeted and comprehensive funding

It is confirmed by Tier 2 node representatives that a better integration and compatibility of different types of EU funding (such as, e.g., ERDF, EFSI, EIB-schemes, CEF) should be undertaken, to facilitate bundling of all resources for an investment priority in TEN-T relevant nodal infrastructure. **This supports recommendation 3 - better integration of different types of EU funding, including CEF grants.**

However, there are several additional suggestions for further elaboration and consideration. Nodes and cities with a **high function** for the TEN-T need prioritised structural funds and CEF resources (where they are not competing with cities outside the TEN-T) to make up for the secondary effects that go along with being a highly functioning logistic hub, especially on the health and mobility side.

“It is important to identify urban nodes functionality for the network, here the function of an urban area is most important, not of the daily urban system. This is a different approach to the 88 urban nodes, which is much too theoretical and static.”

It is thus suggested by urban nodes with inland ports and ports or nodes that are closely connected to ports to **consider a more advanced criteria supported methodology for the distribution of funding**, following the actual function of a node (core and comprehensive) on the TEN-T. It is further suggested to **include investments in sustainable urban mobility measures for highly functioning urban nodes/cities** into the recommendations. Highly functioning logistic hubs are economically important, but they also bring major disadvantages, such as a high consumption of space, high emissions of air pollutants and noise compared to a relatively low amount of jobs per surface unit. These structural locational disadvantages need to be considered and balanced in order to make these nodes liveable and vital.

“We see it as problematic that there is no special funding (ERDF) for logistic hubs. We suffer from a lot of additional truck traffic due to our position as a major logistic hub, but there is no special funding line for cities like us. We have to compete with any other cities for ERDF funding, even though we carry the secondary effects of the freight economy.”

It is suggested to include **revolving funds for private investors** to tackle renewable energy provision to shipping companies or to the freight sector. Also, especially in CEEC, private companies have not sufficient resources to invest in low-emission fleets.

It is also recommended to **simplify** the current funding application procedures and to make low-threshold and easy understandable information on funding opportunities available to the nodes by one urban node.

There is the need to invest in infrastructure to **increase resilience of the nodal structure against climate change, natural disasters and catastrophes**. This can include the construction of bypasses in the network, of rail-freight corridors, or investments in innovative and green shipping logistics. As well, funding should include soft measures for data-based planning and quality control of freight transport,



with the general goal of improving safety and resilience, as suggested by one urban node which is functionally related to a port.

There is a need for a **special funding mechanism** or grants for private investments in low-noise and zero-emissions fleets in the CEEC.

“What about a Junckerplan for small investments? Give incentives to SME to invest in eco-transportation.”

It is important to **support sustainable shipping and strategical distribution of clean fuel hubs for sustainable inland shipping & green logistics**. It is seen as important to better plan and strategically coordinate energy transition on the corridors, including sustainable waterway transport and the distribution of clean fuel hubs for green logistics. Transborder and internodal cooperation in green logistics including shipping combustion technologies and energy provision should be facilitated and funded.

“There is a need for regional approaches and thinking in corridor-segments when it comes to developing projects on the node level, and to enquire what port cities along the Rhine need. For example, Mannheim and Duisburg need LNG to cover the Rhine, so there should be more synchronization.”

“The connection of the nodes along the corridor doesn't come naturally, it is important to think along the supply and logistic chains and to think in regional connections.”

Tier 2 nodes suggest also financing **bigger and safer parking** for drivers, as well as sanitary facilities. There are huge problems with truck drivers sleeping in their trucks in residential areas and leaving garbage behind. There is a need of bigger and safer parking, also for female drivers, and for new facilities along the corridors and outside the urban nodes outside the urban nodes. Not all node representatives agreed to make this a funding recommendation, but the need should be further investigated.

6.6 Summary of the intermediate validation process for future funding needs

Preliminary recommendations for future funding have been consolidated and specified by integrating the perspective of the Tier 2 urban nodes. The need to come up with more integrated funding mechanisms has been emphasized, as well as the urgency for prioritisation based on an improved methodology. Special emphasis has been put on the need for better rail infrastructure in CEEC and especially on improving the conditions for employees working in the logistic branch along the TEN-T, which is currently having a negative impact on urban nodes.

7 Intermediate validation CEF and TEN-T guidelines

The TEN-T programme is the main action plan for comprehensive transport infrastructure development throughout the European Union³⁴ and is essential for the ambition to realise a single transport area in Europe³⁵. While responding to economic and private users’ needs, this infrastructure development must fulfil key societal requirements, such as balanced accessibility and sustainability.

Currently, urban areas are mainly identified as a place where possible negative exposure of transportation should be mitigated. Due to the increasing role of urban nodes for the European multimodal transport network development and completion CEF and TEN-T policy need to be adjusted. The following table presents seven preliminary recommendations on future TEN-T policy development derived from interaction with a first and advanced groups of urban nodes complemented by the assessment of other experts and stakeholders.

Table 7.1 CEF and TEN-T guidelines

Preliminary recommendations on CEF and TEN-T guidelines	Context and background
1. Strengthen the connection between TEN-T action for long-distance and last mile transportation.	The consortium recommends emphasising the importance of how long-distance transportation impacts last-mile delivery in the guidelines.
2. Address urban infrastructure bottlenecks and missing links.	Due to an increase in regional freight transport, EU policy should focus more on the removal of bottlenecks specifically in urban areas to create added value also for the international, long distance network.
3. Stimulating the seamless sustainable connection between TEN-T long-distance and urban / regional traffic	More emphasis should be placed on stimulating sustainable seamless connections through the establishment of quality standards and collaboration mechanisms between involved planning parties and for seamless sustainable connection between multimodal networks.
4. Stimulate the use of information and integration of telematics applications	While seamless connections by telematics applications is mentioned in the guidelines the need for collaboration and information use of different stakeholders has not been included. The consortium recommends to take-up additional guidance on telematics applications at the interface between long-distance and last-mile transportation.

³⁴ See: http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/brochures_images/b1_2013_brochure_lowres.pdf

³⁵ See The Transport White Paper from DG MOVE setting the “new” EU transport policy: COM(2011) 144, White Paper 2011 ‘Roadmap to a Single Transport Area - Towards a competitive and resource efficient transport system’.



5. Stimulate early market introduction of low-noise and zero-emissions solutions	The consortium recommends using CEF to support early market introduction of efficient low-noise and zero-emissions for urban freight delivery and strengthen present guidelines, from promotion-oriented guidelines to guidelines that stipulate the development of a sustainable urban freight delivery system.
6. Stimulate stronger involvement of the various governmental levels by requiring this in CEF/TEN-T funding	Regions and cities are often consulted at a too late stage, when critical TEN-T planning decisions have already been taken. Investments can only be successful and add value if key stakeholders and key decision makers at the various governance levels are involved from the beginning in EU funded projects (e.g. participation of urban nodes planning administration in Corridor Fora).
7. Starting a discussion on the required functions of a node	To enhance the return on investments of CEF/TEN-T funding, it is important to have a clear picture of (required) functions of an urban node. Questions are: when does a node have added value for the European network? What is the position of an urban node in the corridor(s) of the TEN-T network? Do the current 88 urban nodes generate added value?

7.1 Need for knowledge exchange and better decision-making processes

Urban nodes representatives coming from the public sector want to be more integrated in the decision-making process to be better informed and to better represent their interests. It is suggested to change from the prevalent top-down to a more bottom-up approach, in order to see what the real needs in the nodes are. Especially the corridor-fora are seen as too detached from the local situation in the urban nodes. Nodes and logistic hubs should have more participation in decision-making on the TEN-T level.

“The EU is perceived as far away from conditions here. There should be a change from the top-down to bottom-up decisions, to see what really are the needs in the nodes. The corridor forums are too high-level. Logistic hubs should have more influence.”

It is recommended to create opportunities for further knowledge exchange and learning for planners on every level of the TEN-T. The situation in the consulted urban nodes is very diverse, there is a large variety in institutional capacity and competences for sustainable mobility and freight-planning. All participants complained that the freight topic has not the appropriate urgency on the local and/or national political agenda. It is particularly important to invest in institutional capacity and planning competences for freight on the different scales of the TEN-T. Competence-building in the public sector for freight-planning is considered highly important.

As well, public-private and private-private cooperation on all levels should be promoted and supported. It is suggested to create marketplaces for cooperation on the local, metropolitan and TEN-T scale to create awareness of the nodal functions, cooperation opportunities for competitors, and to develop together



standards and collaboration mechanism. For example, capacity problems can be solved by the market by developing sharing models, when supported by the public sector.

“What are the conditions for participation in the freight sector? As a logistics company, either you have to gain something from participating or you need to have a real problem and a sense of urgency. There needs to be a win-win for everyone involved.”

“In our project, the municipality initiated a market-place to get cars and cargo off the road during street construction works, and offered financial incentives and administrative help. Participative approaches are great to solve capacity problems.”

7.2 Need to put more emphasis on urban nodes providing high functionality to the network

All consulted Tier2 representatives agree with **recommendation 2 – Address urban infrastructure bottlenecks and missing links**. However, e.g. port related urban nodes stress that it is not only necessary to remove bottlenecks for amending the quality of the international network, but also to add a priority on sustainable urban mobility in highly functioning urban nodes (with a considerable high function on the TEN-T). As well, the reduction of through-traffic in highly functioning nodes is an important aim. Here, providing resources for public-private cooperation models for capacity sharing is suggested by all participants of the Venlo workshop. This should make up for the disadvantages that additional through-traffic on corridors bring to the nodes and logistic hubs and help to make the urban environment healthier and more liveable.

Adding to **recommendation 7 – starting a discussion on the required functions of a node**: The current approach of identifying urban nodes on the core network is considered too static and theoretical. It is suggested to consider a more advanced and criteria supported methodology for funding distribution following the actual function of a node on the TEN-T. This would mean to attribute more funding to highly functioning nodes with high investment needs. This may also be nodes on the comprehensive network. Less funding would go to nodes that are not highly functioning in terms of traffic flows on the corridors.

This implies a new graduation of nodes referring to their actual functionality on the network. To identify the urban nodes functionality, the FUA is most important, not the daily urban system. Here, it is important to take different profiles of FUA into account and to reflect which set of indicators can reflect their functionality: cross-border versus not cross-border, poly-centric versus mono-centric, function and functional area, challenges and impact of solutions.



7.3 Need to enhance competence in freight planning and trust and cooperation between the public and private sector

Competence-building in the public sector for freight-planning is considered highly important. This adds another aspect to **recommendation 3 – stimulate the seamless connection between TEN-T long-distance and urban/regional traffic**, as institutional capacity and planning competences are an important condition for the establishment of quality standards and collaboration mechanisms.

“We want to develop intermodal terminals, but we lack data. So, we don’t know the need for intermodal terminals in terms of capacity, where to locate them, how is railway competitive to road, what are the forecasts of spatial preferences of logistic companies?”

“How can we include modelling of freight transport into SUMP?”

“We have a huge cargo and parking problem inside our port city, with major congestion problems. Now we have an extra lane for the tram, this makes the road narrower and creates enormous problems. As well, there is a high average possession of cars per family, up to 4 cars, along with very limited parking space. No underground parking due to archaeological sites. The biggest problem is to find a balance between private and cargo parking. The municipality does not find solutions. We have to change the mindset of the people, we don’t know how.”

As well, public-private and private-private cooperation on all levels should be promoted and supported. It is suggested to create marketplaces for cooperation on the local, metropolitan and TEN-T scale to create awareness of the nodal functions, cooperation opportunities for competitors, and to develop together standards and collaboration mechanism. For example, capacity problems can be solved by the market by developing sharing models, when supported by the public sector.

The private sector also needs to be convinced to share commercial data for further data-sharing, which is an important side-condition for using relevant data in applications. Building of trust is seen as a precondition for this, and the creation of cooperation and collaboration mechanisms with private stakeholders on all scales of the TEN-T is a good means for trust-building. This adds to **recommendation 4: Stimulate the use of information and integration of telematics application**. It is additionally suggested to include stimulating the use of traffic management tools for early warning systems, for example to keep dangerous goods away from city centres in case of bottlenecks and accidents or from dangerous roads. An application would recommend the safest route. Furthermore, another low-cost solution would be to advance the application of GSM-R in the cohesion countries.

7.4 Need for regional SUMPs



Cooperation and the combination of sectoral objectives into one comprehensive proposal is seen as a prerequisite for funding by all consulted urban nodes representatives, thus **supporting recommendation 6 – stimulate stronger involvement of the various governmental levels by requiring this in CEF/TEN-T funding**. This requires a strategic multi-level policy plan that has been agreed upon by the relevant public sector stakeholders. Most participants suggested to make a SUMP (Sustainable Urban Mobility plan) or a SULP (Sustainable Urban Logistics Plan) for FUAs (Functional Urban Areas), also for polycentric regions, a prerequisite for funding – however, there are also apprehensions that this condition could also decrease the acquisition of funding for projects, because the national level is sometimes difficult to reach.

“Request to make a SUMP or a policy plan when applying for funding. If there is no policy in place on a TEN-T corridor segment, then no funding!”

Additionally, urban nodes representatives emphasize the importance of the stimulating **more bottom-up governance structures for the corridors** as an important condition for sustainable freight transport planning on all levels. A more dynamic government structure in which urban nodes can cooperate and set the agenda referring to their needs would facilitate the processes on the TEN-T. It is suggested that corridors could decide on funding priorities and combine these with environmental and climate goals.

7.5 Summary of the intermediate validation process for CEF and TEN-T guidelines

Preliminary recommendations for CEF and TEN-T guidelines have been consolidated and specified by integrating the perspective of the Tier 2 urban nodes. In particular the need to put more emphasis on highly functioning urban nodes has been formulated, but also to increase freight transport planning competences of urban nodes planning administration by a better integration into the TEN-T dialogue and an enhanced cooperation and information sharing with the private sector.



8 Conclusions from the intermediate validation process and interaction with Tier 3 urban nodes

As mentioned earlier, the validation process is still ongoing, and the results presented here are intermediate. WP4 has carried out workshops with a second group of nine urban nodes (Tier 2 urban nodes) and has been personally engaged with 50 urban nodes stakeholders. Intermediate results forms input for the validation of the preliminary recommendations. The interaction with the last and third group of urban nodes (Tier 3 urban nodes) contributes to a final validation round. It will be carried out in the next months to support the development of the final recommendations. In this respect, at the end of this process all 88 urban nodes are planned to be involved in this process with varying intensity.

The applied (modified) stepwise explorative and user-driven approach carried out with Tier 2 urban nodes clearly has been suitable to stimulate the interest and to generate highly relevant results for the validation. Also, in the second validation round with Tier 3 we aim to approve and deepen the preliminary recommendations by improving the knowledge base on urban nodes, including additional aspects in the findings due to an increasing involvement of stakeholders. These in turn should serve to derive more concrete, nuanced and also additional recommendations, or to identify contradictions. The goal is also to identify specific topics for future activities beyond Vital Nodes.

The diversity of the Tier 2 urban nodes was even higher than expected. Differences in thematic interests and specific planning competencies are more striking than expected. The need for further development and the existence of good examples also depends on this. It is clear that nodes with less experience have a greater need for good examples and policies. It was also interesting to note that nodes on the comprehensive network can play an equal role as a core network node, when they have, for example, a higher relevance than an urban node situated on the core network. In this respect, nodes of the comprehensive network should also be integrated into the Tier 3 engagement process.

An important lesson learnt from interaction with Tier 2 urban nodes is that the consideration of barriers to get engaged in the process needs to be taken seriously (see chapter 4.1). Obstacles to integration lie both on the structural level, with a gap of responsibilities for urban nodes development, and on the content level, with - so far - little planning activity about freight transport and urban logistics. However, especially practical aspects cannot be dismissed when carrying out engagement processes.

The theoretical criteria-based grouping approach is helpful but not necessarily practicable. It was effective to first disregard the grouping process and follow practical considerations, and then structure workshops' agenda and breakout sessions accordingly. It has also become clear that relevant topics (in stakeholders' view) should be offered for better communication, as it was done for the workshop in Venlo. Nevertheless, for some urban nodes it may not be helpful to participate directly in a group process and further bilateral interaction is more helpful to facilitate the dialogue process among local and



regional stakeholders first. Other urban nodes have, again, very precise expectations which nodes they would like to exchange with and see this as a basic requirement for general participation.

For Tier 3 urban nodes involvement we intend to continue with this explorative and user-driven approach and keep the threshold for participation as low as possible. We assume that the awareness of the Tier 3 urban nodes is even more heterogeneous and possibly even less developed. In this respect it is very relevant to offer interesting user-needs targeted topics as well as to create a structured and open, trustful working atmosphere, which allows everyone to speak freely and openly when presenting local conditions with all their barriers.

In this sense, nine Tier 3 workshops are supposed to take place at the Urban Nodes Forum in Budapest (4 - 5 April 2019) and possibly at the SUMP Conference in Groningen (17 - 18 June, 2019). In addition to this, bilateral workshops are planned to take place in Tri-City (PL) and Munich (DE)³⁶ in March 2019.

The validation process with Tier 3 urban nodes will be carried out based on the enhanced knowledge available here on challenges and needs of urban nodes and result in D4.3 (Validated Recommendations for Tier 3 groups of urban nodes).

³⁶ Both urban nodes had been eager to get engaged as Tier 2 urban nodes but it was not possible to schedule an earlier meeting due to stakeholders' calendars. Therefore, both urban nodes will be engaged in the Tier 3 interaction.



9 Appendix

9.1 References

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9.2 Agenda for a tier 2 workshop: example Venlo workshop, 8 February 2019

Vital Nodes Tier 2 Urban Nodes Workshop Draft Agenda

8th of February 2019

Room 1.8/1.5 at the Municipal Office, Venlo
Hanzeplaats 1 Venlo
Postbus 3434, 5902 RK Venlo

Moderation: Siegfried Rupprecht, Rupprecht Consult

9.00-09:30	Arrival and registration Coffee & Cake	
09:30-11:00	Welcome	
	Welcome note and introduction to the Cradle-to-Cradle building, Venlo City Hall.	Dick Brouwer, Venlo
	Introduction to Vital Nodes and presentation of workshop goals	
	Vital Nodes' objectives, methodology and outputs for Urban Nodes of the TEN-T.	Marlene Damerau, Rupprecht Consult
	Introduction to urban nodes 'Fingerprints' and impact	Ricardo Poppeliers, Ecorys
	First experiences from Vital Nodes' interaction with urban nodes.	Kevin van der Linden, Rijkswaterstaat
11:00-11:15	Coffee break	
11:15-12:30	Breakout session I in groups 1, 2 & 3	
	What are your challenges, policies, strategies and solutions?	Moderated by:
	Group 1 / Room 1.7 Synergies between freight and passenger transport.	Susanne Böhler, Rupprecht Consult Rainer Müller, Eurovienna



	Keynote: Kathrien de Langhe, University of Antwerp	
	Group 2 / Room 1.6 Energy transition in the freight sector. Keynotes: Theo Heinink, Clean Energy Hubs, Province Gelderland Rob Kroon, E green last mile, Fier Automotive	Onno de Jong, Ecorys Kevin van der Linden, Rijkswaterstaat
	Group 3 / Room 1.10 Quality of life Keynote: Jaagup Ainsalu, Municipality of Tallinn/ Mobility lab	Rob Ghyselen, Omgeving Vlaanderen Marlene Damerau, Rupprecht Consult Raymond Linssen, Rijkswaterstaat
12.30-13.30	Lunch break in room 1.8/1.5	
13:30-13:45	Short presentation on outcomes of break-out sessions I	
13:45-15:00	Breakout Session II in groups 1, 2 & 3 What are funding and support needs to realise potential solutions and their envisaged impacts?	
15.00-15:30	Coffee Break & refreshments	
15:30-15:45	How can Vital Nodes expertise be used by urban nodes?	Einar Schuch, Trafikverket
15.45-17.00	Panel Discussion Urban Nodes in the TEN-T core network. What is the next step?	
	What solutions are needed to achieve quality of life in urban nodes? How could Urban Nodes be better positioned in the TEN-T dialogue and coordination?	Moderated by: Siegfried Rupprecht, Rupprecht Consult Raymond Linssen, Rijkswaterstaat Kathrien de Langhe, University of Antwerp Urban Nodes representatives



9.3 Participants of meetings with Tier 2 urban nodes

Date	Workshop venue	Node	Participant	Organisation
2019/02/25	Sofia	Sofia	Metodi Avramov	Sofia Urban Mobility Centre
			Tsvetan Tsolov	Sofia Urban Mobility Centre
			Konstantin Georgiev	Sofia Municipality
			Ivan Nikolov	Sofia Municipality
			Bilyana Yachkova	SUMP Team
			Marlene Damerau	Rupprecht Consult
			Susanne Böhler-Baedeker	Rupprecht Consult
2019/02/06	Duisburg	Duisburg	Dr. Thomas Griebe	Municipality of Duisburg (Environment and Air monitoring)
			Ralf Zigan	Municipality of Duisburg (Planning Department)
			Susanne Böhler-Baedeker	Rupprecht Consult
			Marlene Damerau	Rupprecht Consult
2019/02/08	Venlo	Antwerp	TAVERNIER, Laura	Stad Antwerpen
			DE LANGHE, Katrien	University of Antwerp
			SIMONS, Karen	Rebelgroup
2019/02/08	Venlo	Piräus	POULOU, Maria	Piräus Planning Department
			BRAIMI, Nayia	Piraeus Municipality
			SPYROU, Dimitrios	Piraeus Port Authority



D4.2 Validated recommendations for Tier 2 groups of urban nodes

			RODOPOULOS, Nikolaos	Piraeus Commercial and Industrial Chamber
			MANESIOTIS, Nikolaos	Piraeus Trade Association
2019/02/08	Venlo	Cologne	TROESSER-BERG, Guido	Nahverkehr Rheinland GmbH
			KOLL, Florian	Nahverkehr Rheinland GmbH
2019/02/08	Venlo	Bilbao	ROJAS, Nerea	ML Cluster
2019/02/08	Venlo	Venlo	PETERS, Leon	Venlo Municipality
			VAN WIJILICK, Peter	Venlo Region, Trendsportal
			HENSGENS, Jos	Venlo Municipality
			BROUWER, Dick	Venlo Municipality
			HEININK, Theo	Province Gelderland
			HENDRIX, Maarten	Province Limburg
			VAN DORT, Tom	Province Limburg
			STEVENS, Ward	Venlo Municipality
			LENDFERS, Bart	Venlo & Sittard-Geleen Municipality
			KROON, Rob	Fier Automotive
			BAK, Chris	Province Limburg
2019/02/08	Venlo	Tallinn	PõLD, Arpo	Private logistics company
			SOPPE, Harly	Mobility and innovative solutions LAB
			AINSALU, Jaagup	City of Tallinn, Transport Department



D4.2 Validated recommendations for Tier 2 groups of urban nodes

2019/02/08		Sofia	KOLEV, Tsvetan	City Admin.
				Mobility Lab Tallinn
2019/02/08	Venlo	Vital Nodes Partners	GHYSELEN, Rob	Omgeving Vlaanderen
			DE JONG, Onno	Ecoresearch
			POPPELIERS, Ricardo	Ecoresearch
			VAN DER LINDEN, Kevin	Rijkswaterstaat
			LINSSEN, Raymond	Rijkswaterstaat
			MUELLER, Rainer	Eurovienna
			SCHUCH, Einar	Trafikverket
			RUPPRECHT, Siegfried	Rupprecht-Consult
			BÖHLER-BAEDEKER, Susanne	Rupprecht-Consult
			DAMERAU, Marlene	Rupprecht-Consult
2019/02/14	Ljubljana	Ljubljana	Urgula Longar	City of Ljubljana, Economic activities and transport department
			Andreja Jagodic	City of Ljubljana, Economic activities and transport department
			Zdenka Simonovic	City of Ljubljana, Development projects and Investments service
			Ivan Stanie	City of Ljubljana, Urban planning department
			Matej Gojeie	Regional development agency



D4.2 Validated recommendations for Tier 2 groups of urban nodes

			Damjan Kregar	Urban public transport Operator in Ljubljana
			Jost 'Smajdek	Urban public transport Operator in Ljubljana
			doc. dr. Peter Verlie	Traffic institute (railway research institute)
			mag. Blai Jemergek	Traffic institute (railway research institute)
			Klun Miha	Traffic planner and research organisation
			Marko Fatur	Traffic planner and research organisation
			Daniel Jurman	Ministry of infrastructure
			Gregor Robie	DRI - state owned company for infrastructure planning and design
			Franc Šoba	DRI - state owned company for infrastructure planning and design
			Anica Sambolle	DRI - state owned company for infrastructure planning and design
			Rainer Müller	EUROVIENNA
			Marlene Damerou	Rupprecht Consult

