VITAL NODES

D4.1 Vital Nodes transferability, outreach and node-integration strategy

Knowledge exchange concept, operational cooperation and integration plans

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Executive summary

In addition to experiences from Vital Node's current implementation, other projects like MORO in Germany and TENTacle in the Baltic Sea Region have conducted consultations processes with consistent results. They evidenced a call for an improved coordinated communication and planning between the different governance levels, persistent low levels of awareness of urban node's TEN-T role and functionality among some urban nodes, and the existence of fragmented communication within the TEN-T structure.

Vital Nodes intends to facilitate knowledge exchange of evidence-based practice(s) and coordinated action among all urban nodes and functional areas of the TEN-T core network, not only including national, regional and local authorities such as transport and urban and spatial planning professionals, but also other relevant organisations and stakeholders. Thematical focus of Vital Nodes is freight transport and logistics. Therefore, this includes organisations like freight and infrastructure operators (road, rail, waterborne) and stakeholders from the private and public sector. Different geographical scales need to be considered– local, regional, and corridor. When exploring the specific field of freight and logistics, differences to passenger transport become obvious. For freight and logistics, we need to deal with a much wider area (Functional Urban Area) than with the usual passenger transport oriented commuting zone (Daily Urban System).

The Vital Nodes transferability concept should upscale identified solutions and practices (in freight and logistics) to a common level of understanding and analysis and should allow urban nodes to easily relate to each other's challenges and experiences, and, thus, establish an effective process of knowledge exchange.

This document focusses on describing the current situation and difficulties related to urban nodes and their integration in the TEN-T (Chapter 2). It will consider TEN-T policy and its governance structure, the bottom-up initiatives from urban nodes and their importance within TEN-T functionality. Lastly, the chapter shows the limited level of knowledge exchange between and within urban nodes and reflect on its enhancement needs. Once the problem and challenges have been thoroughly understood, Chapter 3 considers the specific requirements the project establishes for an effective transfer and outreach process. It outlines content of analysis, formats of exchange that the project proposes, as well as the participants of the activities. Thereafter, the document presents a brief literature review of relevant transferability approaches developed within previous EU projects. The argumentation then leads to the development of a Vital Nodes transferability strategy. Finally, Chapter 4 describes the operational plan for Tier 2 and Tier 3 deployment activities. It delineates the organisational aspects and mechanisms of participation.

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1 Introduction

Why do we need a transferability strategy?

The Trans-European Transport Network (TEN-T), as master plan for the comprehensive development of transport infrastructure throughout the EU, aims to ensure economic, social and territorial cohesion, as well as improving accessibility, across the Union. Consequently, its policies and actions have mainly focused on the enhancement of long-distance mobility for persons and freight, via road, rail and water, with the Core Network Corridors as fundamental axes of development.

Still, functional urban areas have also been recognised as key elements of the TEN-T network. In their 2016 *Issues Papers,* EU Corridor Coordinators highlighted the impact integrated transport planning in urban nodes has on traffic flows along the corridors (Trautmann & Grosch, 2016). The increasing mobility needs and freight transport demand, require nodes to respond by implementing new logistics concepts, ensuring transport modes' seamless interconnection and accommodating spatial-economic growth and urban expansion. As a fundamental factor to face such challenges, EU coordinators identified the great potential reinforcing exchanges between all urban nodes has to "enhance their *functioning* as flourishing cities." (Trautmann & Grosch, 2016)

Goal of Vital Nodes

In accordance, Vital Nodes intends to facilitate knowledge exchange evidence-based good practice(s) and coordinated action among all urban nodes and functional areas of the TEN-T core network, not only including national, regional and local authorities such as transport and urban and spatial planning professionals, but also other relevant organisations and stakeholder, specifically from freight and logistics. This includes organisations like freight and infrastructure operators (road, rail, waterborne) and stakeholders from the private sector working on different geographical scales – local, regional, corridor. The project will build a long-lasting European network of key stakeholders based on existing European, national and regional networks.

The Vital Nodes project is a Coordination and Support Action (CSA) executed under the European Commission's Horizon2020 program (see text block below).

> ***Background: Goal of the Vital Nodes project***
>
> *Vital Nodes aims at enabling efficient, sustainable freight delivery across the TEN-T urban nodes (metropolitan areas), by bringing together existing European, national and regional networks of experts and professionals. As a result of increasing freight/logistic traffic, these urban nodes need to cope with challenges such as congestion, poor air quality, noise, and road safety risks. The objectives of the Vital Nodes project are to improve European interconnection, while developing sustainable mobility within cities. Vital Nodes will deliver evidence-based recommendations for effective and sustainable integration of the nodes into the TEN-T network corridors, addressing specifically the multi- and intermodal connection between long-distance and last-mile freight logistics. It will also support the deployment of innovations in the urban nodes, while establishing a long-lasting European expert network.*

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Challenge of integration of urban nodes and finding solutions for all

However, 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. Nevertheless, each individual Urban Node could provide case examples, practices and learning experiences within their given context, which can service as inspiration and role model for other nodes.

Need for a transfer, node-integration, take-up strategy

This situation requires outreach strategies that do justice to the heterogeneity in terms of planning traditions and cultures, perceived sense of urgency and TEN-T benefits, local public pressures, level of awareness for their TEN-T role and their degree of proactiveness. Besides, the 88 urban nodes also vary in terms of geographical factors like size and location, cohesion bordering, corridor-membership, function (e.g. maritime vs. landlocked) as well as challenges (different impact scales). In short, an effective outreach strategy must pick up each city-region wherever it currently stands.

Therefore, it is necessary to develop bespoke transferability methods and tailored take-up approaches to reach and involve specific target sub-groups through most relevant communications channels, messages, techniques and contents. In operational terms, it shall allow the wide-scale promotion and coordinated deployment of innovative tools and solutions. Lessons derived so far, show for example that cases provide solutions related to awareness raising, linking measures/solutions between local/regional and corridor scales and linking land use planning and freight/last-mile delivery. Another experience is that up to now there is little validated practices available proving high-impact on nodal development.

This document will first focus on describing the current situation and difficulties related to urban nodes and their integration in the TEN-T, in Chapter 2. It will consider TEN-T policy and its governance structure, the bottom-up initiatives from urban nodes and their importance within TEN-T functionality. Lastly, the chapter will show the limited level of knowledge exchange between and within urban nodes and reflect on its enhancement needs. Once the problem has been thoroughly understood, Chapter 3 considers the specific requirements the project establishes for an effective transfer and outreach process. It outlines the mechanisms of the applied methodology (see D2.1), content of analysis, formats of exchange that the project proposes including participants of the activities (see D3.2). Thereafter, the document presents a brief literature review of relevant transferability concepts developed within previous EU projects. The argumentation then leads to the development of Vital Nodes transferability strategy. Finally, Chapter 4 describes the operational plan for Tier 2 and Tier 3 deployment activities. It delineates the organisational aspects and mechanisms of participation.

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2 Knowledge exchange among and within urban nodes

To ensure an efficient and comprehensive outreach strategy is attained, it is first important to understand the TEN-T structure and governance levels, as a basic framework to describe the current situation of its urban nodes and the obstacles for optimal node-integration.

2.1 TEN-T policy and Core Network Corridors

With the objective of streamlining efforts and facilitating the coordinated development of the TEN-T Core Network, nine Core Network Corridors were identified in 2013. These corridors include the key strategic elements of the TEN-T and constitute the backbone of the multimodal network. The corridor implementation of TEN-T policy is based on three pillars: enhancing cross-border connections and removing bottlenecks; integrating different transport modes (multi-modality); and promoting technical interoperability (EU Corridor Coordinators, 2014). As stated by the 2016 study on *Efficiency in Urban Nodes*, "The shift from individual projects and nodes to a holistic network approach with nine strategic core network corridors and intermodal urban nodes is the new trans-European transport network culture. Interoperability and inter-modality are the core concepts to further develop the core network and its urban nodes" (European Commission, 2016).

The oversight and deployment of the corridors lays with the EU Coordinators, 9 high-level personalities with long standing experience in transport, financing and European politics, who were appointed by the European Commission in 2014. Each Coordinator stimulates and coordinates action along the respective corridor, in order to ensure its effective and efficient deployment. Coordinators are provided assistance by the EC, by means of appointed Advisers, who assists in both content and procedural aspects. With the role of fostering this new framework of multimodality as guiding principle for networking throughout the corridor, European Coordinators chair meetings, oversee the budget and look into the needs and policy aspirations of the corridor.

In addition, the EC established two horizontal priorities, the European Rail Traffic Management System (ERTMS) and Motorways of the Sea (MoS), to carry forward the strategic implementation of the Core Network objectives for rail traffic management and maritime transport, respectively. To lead actions on both horizontal priorities, two more European Coordinators were appointed.

The ambitious objective of completing the Core Network and its Corridors by 2030 can only be fulfilled by ensuring active stakeholder participation and consultation. Such cooperation is guaranteed by two main tools: Corridor Forum meetings, a consultative assembly involving relevant stakeholders that supports the EU Coordinator; and working group meetings and events, where the Coordinator collaborates with a selection of stakeholders towards specific missions.

TEN-T working structure, members of Fora and nature of the working groups to give urban nodes more visibility and to promote practice exchange

Corridor Fora constitute the principal scenario for required collaboration of relevant actors. In these events, which take place two to three times per year, Coordinators meet with a gradually increasing number of

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stakeholders. Initially it included only representatives of the concerned Member States (i.e., from Ministries of Transport or TEN-T related-departments). However, considering the importance of railway transport for the TEN-T, rail operators and managers were eventually involved as well. Port authorities have also been included, such as airports, seaports and inland ports. In a similar manner, Corridor Fora has offered membership to regional entities. Nevertheless, lower regional administrative divisions and nodes have normally not had the chance to participate in these events.

Corridor Fora are one opportunity for Coordinators to interact with local stakeholders, and thus, take their perspective into account for the development of the corridor´s work plan and the coordination of policies. There are also working groups, established on around specific type of stakeholders in accordance to each corridors circumstances and objectives. Some of the established working groups include inland waterways and port authorities, rail operators and airports, urban nodes and the regions, and infrastructure managers, among others. Still, the occurrence of such working group meetings depends on the objectives and priorities of each corridor, and, usually, on a much less regular basis than Corridor Fora.

Working groups often struggle to achieve good levels of participation and engagement from representatives and stakeholders from urban nodes, mainly due to the diverse level of awareness about their position and role within the TEN-T. Lessons derived from the first Vital Nodes workshops, is that awareness raising in most of the urban nodes is of great importance. Often stakeholders of one urban node see each other for the first time, or do not interact with each other regularly. The knowledge exchange between different urban nodes seems also to be rather limited.

Interaction and exchange of stakeholders between and among urban node is crucial for the nodal development. This becomes obvious by zooming in and out between concrete locations within the urban node and the regional and corridor scales. What seems as a local bottleneck at first sight from a local perspective, might be a European as well when zooming out on the broader corridor perspective.

2.2 Urban Nodes and their relevance within TEN-T functionality

What are urban nodes and why are they important?

The 2013 TEN-T Guidelines identified 88 urban nodes of the Core Network. These were selected on the basis of a defined methodology concentrating on socio-demographic and economic criteria. The document also presented a list of mode specific hubs (air-, sea- and inland-ports, as well as rail-road terminals) that structure the core and comprehensive networks. In accordance, urban nodes have been defined as areas where passenger and freight terminals, and logistic platforms are located in, and which is connected to other transport infrastructure of the TEN-T, as well as to regional and local traffic (European Parliament and Council, 2014).

As such, Urban Nodes are fundamental elements in the TEN-T structure, ensuring connection between the different modes and linking long-distance, regional and urban transport. Due to their key role as socio-economic and technological centres, they are the “origins or destinations of most transport flows along core network corridors” (Trautmann & Grosch, 2016). Consequently, ensuring efficient first- and last-mile connections constitutes one of their main challenges.

Besides, the described connectivity and hub functionality results in high volumes of traffic crossing through urban nodes, in their way along Core Network Corridors. Traffic conditions within these areas, such as

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congestion, air- and noise-pollution regulation, account for the generation of bottlenecks that affect transport flows through the TEN-T.

Need for more and better communication, cooperation and knowledge exchange

Given the relevance of the described challenges, various governance levels have turned their focus towards identifying effective solutions. In the previously quoted *Issues Papers* from 2016 TEN-T Days in Rotterdam, EU CNC Coordinators stated that "enhancing communication and cooperation between cities along core network corridors may generate new concepts and mutual benefits for long-distance and urban transport. Such mutual benefits may include:

1. The removal of 'urban bottlenecks' (physical, technical, organisational) along main arteries of the TEN-T: this allows congestion reduction and improvement of long-distance traffic flows as well as better connections between TEN-T and local transport networks;
2. The enhancement of multi-modal transport solutions and seamless connections, with a shift towards more sustainable transport modes and urban freight solutions;
3. The mitigation of negative effects of transiting rail and road transport on the urban environment (issues such as noise, safety, environmental impact)." (Trautmann & Grosch, 2016)

Urban nodes undertaking measures and policies that improve TEN-T functionality

There are also constant activities coming from urban nodes themselves. Although local transport policy mainly focuses on urban objectives, spatial planning policies and transport measures undertaken by nodes are very relevant for TEN-T functionality. Especially in the context of planning regarding their function as inter-modal hubs (main train stations, harbours, airports), which connect to TEN-T elements and corridors. For instance, local authorities and stakeholders are often very interested in enhancing the "use of intermodal urban freight terminals and logistics platforms, and approaches for linking long-distance with last-mile freight delivery in urban areas" (European Commission, 2016). And consequently, urban nodes have advanced in the implementation of measures, like:

- Improving railway infrastructure and ITS, as well as the enhancing and capacity development of public transport services at the metropolitan level.
- Promoting active mobility (walking and cycling), which should result in a modal shift, and frees up capacity in other modes.
- And, especially urban nodes with ports, the development and implementation of measures to increase the modal shift for freight towards rail and inland waterways.

These type of initiatives, identified within the *Efficiency in urban nodes* study (European Commission, 2016), are fundamental for the improvement of TEN-T functionality

CEF and significance of the funding approved for the priority urban nodes of the Core Network

Moreover, Connecting Europe Facility (CEF), as main funding instrument to realise EU transport policy, has allocated € 204 million to projects under the 'Urban Node of the Core Network' priority, between 2014 and 2016 (European Commission, 2018). This significant amount evidences the active participation and importance of urban nodes in the implementation of measures that enhance TEN-T connectivity and efficiency.

Diversity of UN as a difficulty, importance of identifying relevant stakeholders

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Still, in order to achieve high levels of node integration that lead to coordinated action, representatives and stakeholders from urban nodes would need to find proper spaces for discussion and participation within the TEN-T governance structure. In addition, common challenges and interest would need to be identified, to encourage integration and exchange. It is important to remember that this is a set of very diverse urban areas, with different sizes, socio-economic conditions, interest and objectives. Besides, each node comprises a number of different spatial scales, modalities, sectors and stakeholders relevant to the TEN-T functionality, and all should be taken into account when optimizing the integration of solutions for accessibility and profitability of freight logistics on the one hand, whilst ensuring vitality and liveability on the other (see D2.1 for the definition of Vital Nodes impact criteria) .

In this view of developments, it is important to properly identify key stakeholders within the urban nodes, and consider their role and perspective, to successfully involve them in the project´s activities (see D3.2 for the identification of stakeholder). Also, effective approaches should be encountered for the integration of infrastructure planning, urban planning, and passenger and freight transport (Arts, Linssen, Hanekamp, & Broesi, 2015).

Functional urban areas as spatial dimension for freight transport and logistics

When exploring the specific field of freight and logistics, differences to passenger transport become obvious. For freight and logistics, we have to deal with a much wider area (Functional Urban Area) than with the usual passenger transport oriented commuting area (Daily Urban System). For example, Vienna's functional area (for freight transport) also includes the urban node of Bratislava. In principle the functional area for each urban node needs to be defined specifically.

2.3 Level of Knowledge Exchange among Urban Nodes

Lack of systematic knowledge exchange within corridor activities, or among nodes of different corridors

TEN-T Corridor Coordinators work towards the streamlining and direction of actions that improve connectivity and efficient multimodal transport along their corridor. And indeed, these objectives require a very close cooperation with local stakeholders at different levels. Corridor Fora are the main scenario to achieve such collaboration of with relevant actors. Nevertheless, discussions on this level are mainly focused on large scale strategies, priorities for the corridors work plan and infrastructure projects for long distance transport, which have major effect on the corridor, as a whole. Urban nodes, their roles and challenges, commonly occupy a lower priority position within these events. In addition to that urban nodes often do not recognize their interests in these discussions as these seems to be too large scale, too far away from daily life issues in the urban nodes. However, local, regional and (inter)national transport flows (passengers and freight) come together in these urban nodes and in bottlenecks and gridlocks in TEN-T corridors.

Alternatively, CNC Coordinators have approached nodes and the regions mainly on the frame of working groups and other initiatives. Unfortunately, the level of participation and engagement of urban nodes towards these corridor activities varies and lack systemic character. There is also a missing link from corridor activities to city and region oriented platforms (e.g. CIVITAS) and networks such as Polis and EUROCITIES. Therefore, it strongly depends also on the level of awareness and political will from local authorities, at the time. As a result, it is very difficult to ensure all relevant nodes are involved in the discussions and to establish a continuous process with long-term vision and initiatives.

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Need to raise awareness to improve coordinated planning and integrated action

This situation has been identified by local stakeholders and authorities, as well as TEN-T Coordinators. In addition to experiences from Vital Node's current implementation[1], other projects like MORO in Germany (Bundesamt für Bauwesen und Raumordnung (BBSR), 2018) and TENTacle in the Baltic Sea Region (TENTacle, 2018), have conducted comprehensive consultations processes with consistent results. They evidenced a call for an improved coordinated planning between the different governance levels, persistent low levels of awareness of their TEN-T role and functionality among some urban nodes, and the existence of fragmented communication within the TEN-T structure.

TEN-T objectives and actions towards enhanced involvement of nodes and their stakeholders

In reaction to the problems and challenges, CNC Coordinators propose to ensure an effective multi-level governance with a broad involvement of stakeholders, so "urban actors and networks may contribute to activities of the corridor forum meetings, i.e. assume a more active role in the core network corridor governance system and take part in special working groups" (Trautmann & Grosch, 2016). Understanding that "enhanced cooperation, especially along a Corridor, can contribute to generating action to smoothen the transport flows". In those urban nodes, which are located at the intersection of corridors, it is also important to ensure cross-corridor synergies.

On several Core Network Corridors, platforms and networks have been established to involve local authorities, such as EGTC Rhine-Alpine and the Northern Growth Zone (linking Stockholm, Turku, Helsinki and St Petersburg). Besides that, the MORO project that brings together experiences and needs of German urban nodes might be a stepping stone for ensuring future multi-level governance beyond one corridor.

[1] See Deliverable 3.1. Validated recommendations on the integration of the urban node Vienna in the TEN-T Network

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3 Transferability and outreach strategy

The main goals of Vital Nodes are:

- Building a long-lasting European network of key stakeholders based on existing European, national and regional networks.
- Delivering evidence-based recommendations for more efficient and sustainable integration covering all 88 urban nodes in the TEN-T corridors, addressing specifically the multi- and intermodal connection between long-distance and last-mile freight delivery.

This will be achieved by applying and enriching the validated NUVit approach for the optimisation of economic, social and environmental vitality of functional areas from the perspective of multimodal transport infrastructures and spatial development, thus developing the Vital Nodes Toolbox. The application of the strategy involves undertaking a series of workshops in which, together with key stakeholders, nodal functionality, challenges, barriers, drivers, (impact of) solutions and practices are discussed and analysed based on the appraisal framework and the six NUVit dimensions (spatial, network, time, value, institutional and implementation), and considering the relevant geographic scales (TEN-T corridor, regional/peri-urban, and local/intra-urban) in particular the spatial dimension Functional Urban Areas relevant for freight transport and logistics .[2]

The Vital Nodes transferability concept needs to consider the mechanisms of the applied methodology, content of analysis, and formats of exchange that the project proposes. Moreover, a knowledge exchange and node integration process, naturally depends on the participants and the interaction. For the development of the Vital Nodes transferability concept, following basic questions were considered:

- Who will take part of the exchange?
- What content will be the object of transfer?
- Which are the available mechanisms of interaction?

Who: Stepwise approach

To overcome the complexities described in previous chapters, 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 for the methodology. Then, the procedure is further tested and fine-tuned through its application on 8 other urban nodes (Tier 1). And, after the experiences with individual urban nodes in Tier 1 (1+8 urban nodes), application will 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). Table 1 presents the nodes selected for each Tier of deployment.

[2] For a more detailed account of the methodology and its application, see Deliverable 3.4: Preliminary Vital Nodes Toolbox.

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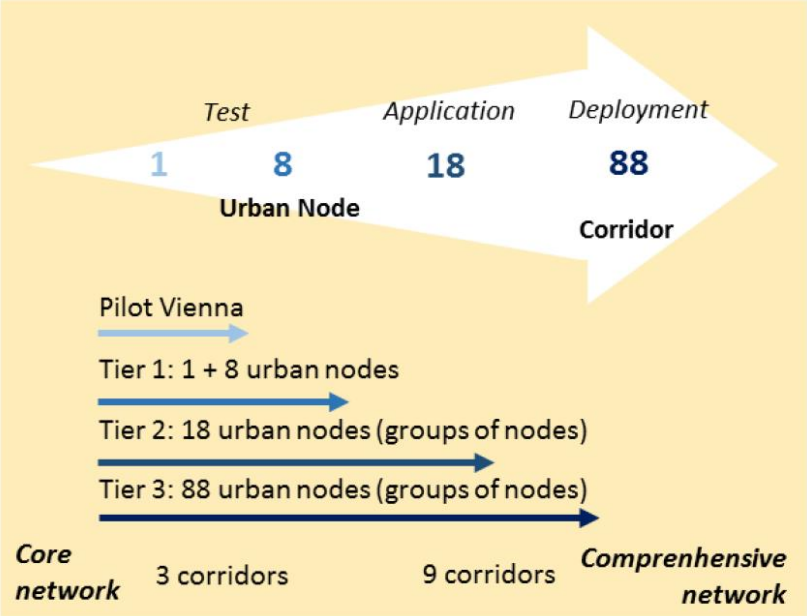

Figure 1: Vital Nodes' Stepwise deployment approach

Table 1: Urban Nodes selected for Tier grouping[3]

Tier 1	Tier 2	Tier 3
Vienna	Copenhagen	88 Urban Nodes of the Core Network
Rotterdam	Antwerp	
Gothenburg	Tallinn	
Budapest	Bratislava	
Hamburg	Valencia	
Genoa	Sofia	
Turku	Gdansk/Gdynia	
Strasbourg	Piraeus	
Mannheim	Duisburg/Venlo	

What: Relation to Vital Nodes goals and outputs

Lessons and practices from experiences in the initial workshops have served to add to the Vital Nodes Toolbox. A set of instruments has resulted, defining optimal methods for the preparation, undertaking and evaluation of workshops and their products. These include: the elaboration of fingerprints which presents an overview of facts and figures on different scale levels in relation to the specific urban node; the production of maps and visual aids to contextualise workshop's debate; the application of an appraisal framework (as integrated part of the methodology) which validates the impact of encountered solutions

[3] Munich, who was originally part of the Tier 1 urban nodes is willing to be part of Tier 2 and/or to accommodate a Vital Nodes workshop in a later stage of the project.

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and partly based on collected and validated good practices; and a detailed operational guideline for the coordination and successful execution of workshops[4].

This methodology is being further tested and developed through its implementation with Tier 1 nodes. Deployment for Tier 2 and 3 shall follow the established technique and build upon results from the Tier 1 workshops (WP3).

***How:* Mechanism for exchange**

The described gradual deployment, with three Tiers that together cover all 88 urban nodes of the Core Network, characterises the projects broad outreach strategy. Now, to effectively build a long-lasting Network of Networks and encounter optimal solutions, the application with each Tier needs to pick up the discussion and conclusions from previous Tiers and, conversely, contribute to the further characterisation of challenges, development of recommendations and collection of good practices and solutions. It is then necessary to establish a nonlinear dynamic for knowledge exchange, where nodes from all Tiers receive input from each other and, thus, form an integrated long-lasting network (see Figure 2).

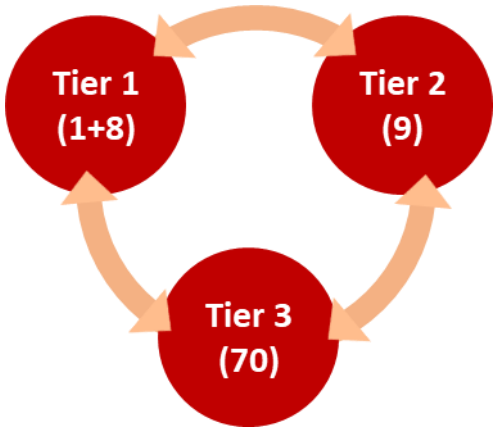

Figure 2: Knowledge exchange within Vital Nodes

3.1 Transferability Strategies from previous EU projects

In order to develop an optimal transferability strategy, it is also relevant to evaluate and build on successful concepts from previous projects, which have focussed on transfer strategies. In accordance, strategies from various initiatives, such as TIDE, METEOR, GUARD and NICHES+ have been studied.

[4] See D3.2, D3.1 and D2.1 for more detailed information.

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These transferability concepts are generally based on a linear one-to-one exchange between a clear source of knowledge and a defined receiver, and propose methodologies to ensure the transfer is effective. In Figure 3 and

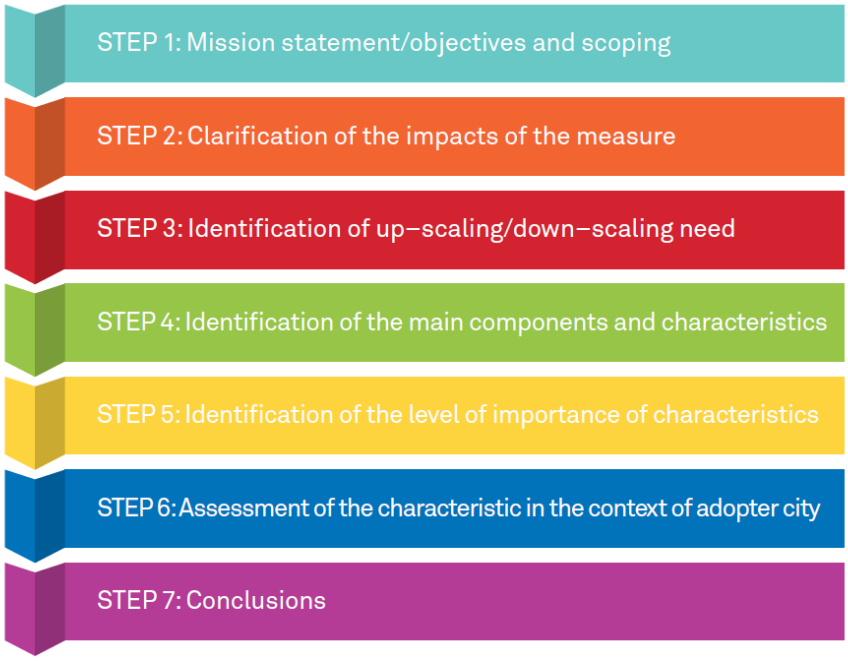

Figure 4, METEOR and TIDE Transferability Frameworks are presented as an example of the studied strategies. The main common steps identified are:

- Characterisation and analysis of the specific context in the source and in the adopter locations;
- Identification of the main components and characteristics of the measure, and assessment of its impacts;
- Adaptation or upscaling of the measure as needed, in relation to the context of the adopter site.

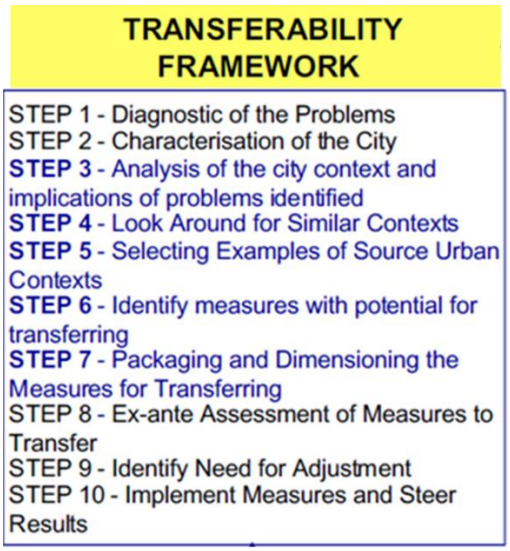

Figure 3: METEOR Transferability Framework (CIVITAS METEOR, 2006)

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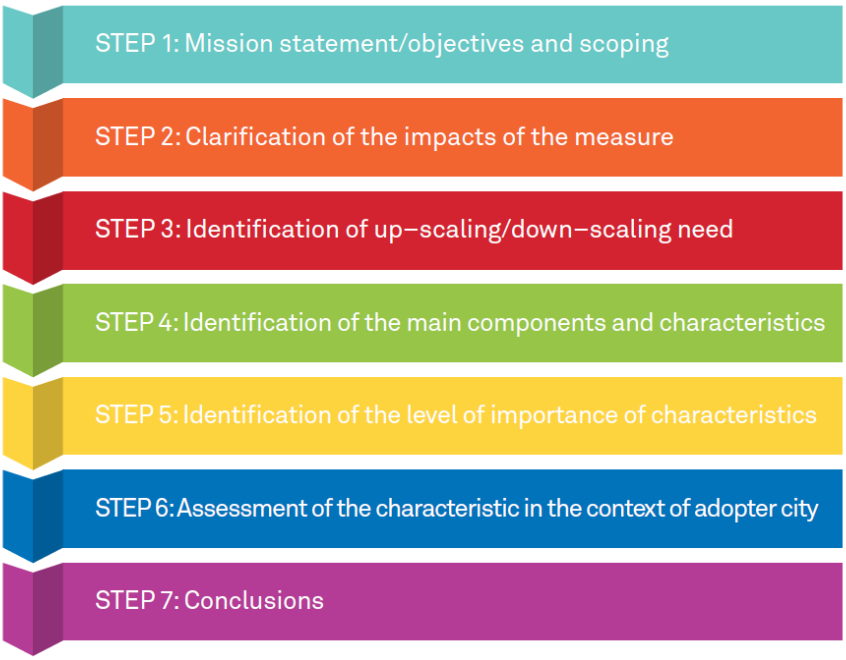

Figure 4: TIDE Transferability Method (TIDE, 2014)

The evaluated strategies highlight the importance of considering the specific contexts of both source and adopter cities, as well as the possible need for upscaling and adaptation of the exchanged concepts. These main principles are also applicable to the transfer of solutions to urban nodes. Nevertheless, due to the complexity of challenges, multiplicity of participants and nonlinear exchange dynamics among urban nodes they do not fully cover the Vital Nodes transferability requirements. The Vital Nodes transferability concept considering findings from previous projects as well as the specific situation of urban nodes are presented in the following section.

3.2 Transferability concept

The concept should upscale solutions and practices to a common level of understanding and analysis and should allow urban nodes to easily relate to each other's challenges and experiences, and, thus, establish an effective process of knowledge exchange. Accordingly, the concept firstly defines categories which should help to classify the challenges, interests, practices and recommendations. The categories should effectively cover all themes relevant to urban node functionality and integration to the TEN-T.

The *Urban Nodes in transnational transport (MORO)* project, financed by the German Federal Institute for Research on Building, Urban Affairs and Spatial Development, is conducting a study on the current development, planning and integration status of urban nodes on the Core Network in Germany. Within this study, consultants, stakeholders and local representatives have participated in a discussion seeking to identify the main topics of interest and their position within a strategic planning context[5].

As a result, three main categories have been defined in accordance to the role and nature of the identified challenges and potential strategies: Policies & measures; Planning processes and instruments; and

[5] First finding of the project are available in German under:
http://www.bbsr.bund.de/BBSR/DE/FP/MORO/Forschungsfelder/2017/staedtische-knoten/start-node.html

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Networking. Figure 5 describes these categories, providing not extensive examples of the themes and challenges contained within each of them.

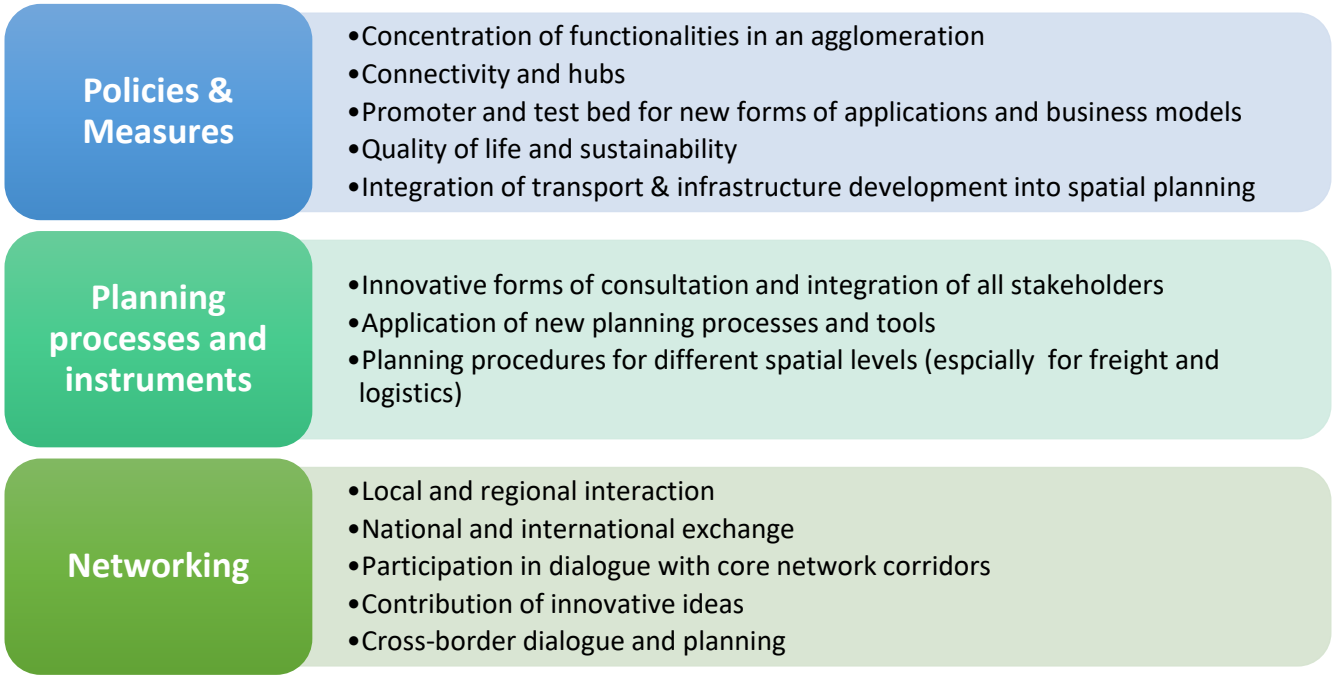

Figure 5: Requirements (and challenges) of urban nodes, adapted from (Bundesamt für Bauwesen und Raumordnung (BBSR), 2018)

- The role of urban nodes in the trans-European network creates a series of thematic challenges that require the implementation of **policies and measures**. Some of these issues are common to cities in general, such as the need to work towards the improvement of life quality and sustainability. However, increased demands are placed on urban nodes as they are intended to function as incubators and model cities for innovative mobility solutions and thus as an example in their region and beyond. In addition, due to their supra-regional function and the effect they have on the functioning of the overall network, nodes face more intensive demands to enhance their connectivity and hub functionality, and integrate their infrastructure development and spatial planning, among other.
- Besides, the implementation of the such requirements for urban nodes of the TEN-T, also presents many challenges in terms of **planning processes, instruments and approaches**. There is a need to develop and implement innovative planning procedures with improved participation of all actors, also beyond the administrative boundaries of the core city, and with a view to expanding their pioneering role in the wider region.
- As previously discussed, strengthening the **networking** activities between nodes, at national and international level, is one of the core ideas of the European Commission regarding urban nodes. These networking activities range from a general exchange within the urban node and between urban nodes to share experiences and practices and to implement coordinated policy through integrated planning, and the success of cooperative planning for cross-border projects.

The three categories should encompass the relevant fields of interest for the improvement of urban node functionality and integration in the TEN-T. In this way, it constitutes an instrument to complement the Vital Nodes Toolbox and ensure an effective transfer to all 88 urban nodes, and beyond.

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Figure 6 presents the relation between the elements in the draft Vital Nodes Toolbox and the transferability steps identified. Thus, it describes their role within the project´s transferability strategy.

The production of fingerprints, analysis and stock-tacking achieved through workshops, and the employment of the appraisal methodology, focus on studying the nodes and their context, discussing their challenges, identifying solutions and good practices, and assessing the impacts of said solutions. It is important to note that Vital Nodes presents a nonlinear process, which is why all interactions between elements of the Toolbox flow in both directions.

Classifying resultant challenges, solutions, good practices and recommendations that result from the Vital Nodes activities within the proposed framework will allow urban nodes to identify their needs and challenges, relate to experiences and good practices from other nodes, and find common ground that leads to valuable communication and knowledge exchange.

Workshops for Tier 2 and Tier 3 should provide results and input for delivering validated solutions and recommendations with special attention to logistics and freight. And serve to integrate different stakeholders participating in these workshops and ask them to become part of the long-lasting European expert network. Building upon experiences from Tier 1, discussions should focus on

- concrete tools;
- planning techniques;
- modelling approaches;
- participation methods;
- policies;
- infrastructure funding plans;
- technologies;
- business models;
- institutional cooperation mechanisms;
- functioning private-public cooperation models;
- stakeholder-moderation processes;
- vertical integration strategies etc.

The outreach and deployment activities presented in the next chapter, encourage and provide appropriate spaces for these interactions.

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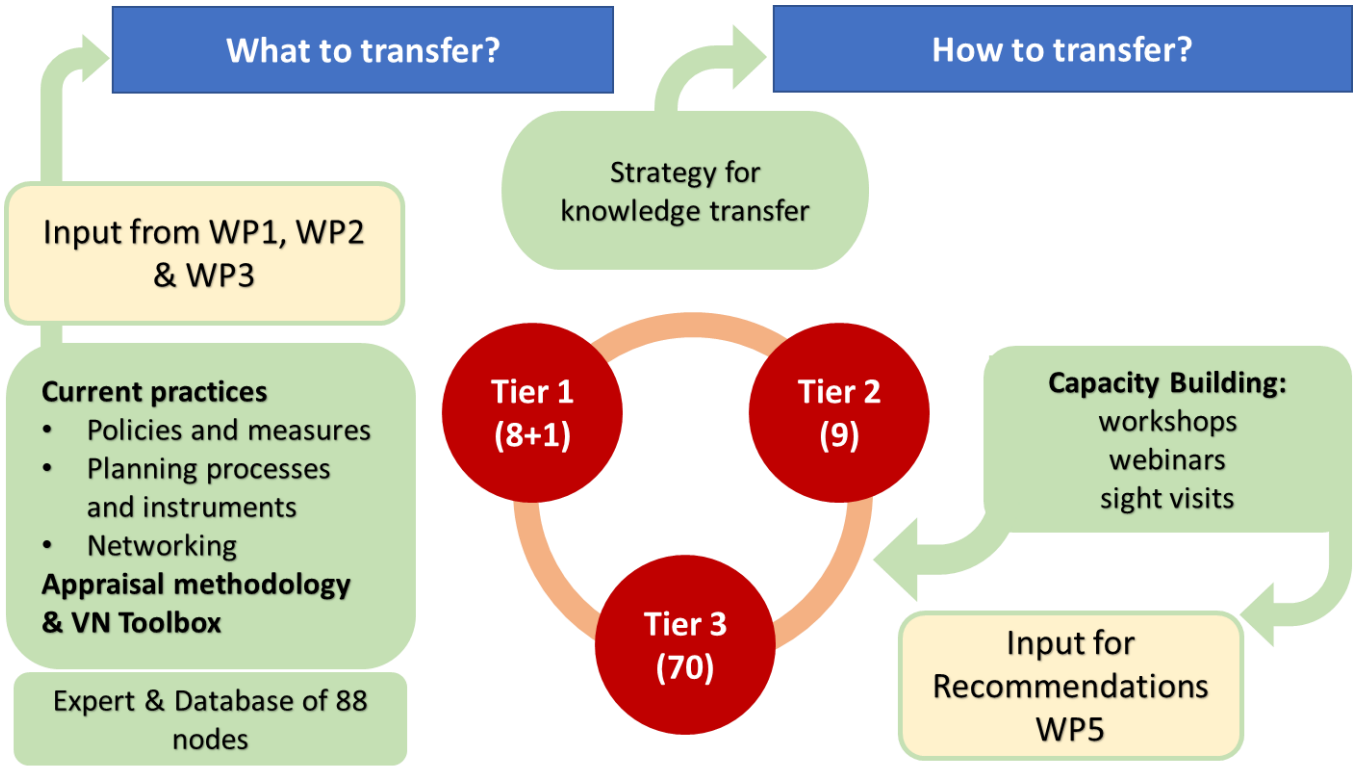

Figure 6: Vital Nodes tools and mechanisms and the elements of an effective transferability strategy

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4 Organisation of the knowledge exchange

As previously described, Vital Nodes' outreach strategy is defined by its stepwise approach, defining three Tiers of nodes for their progressive engagement along the project. The organisations and individuals to be involved should include a broad range of relevant stakeholders, whose actions should be directly linked with the development in the urban nodes and its functional urban area. This includes representatives of regional and national governments, the business community, corridor coordinators, infrastructure operators, etc. The purpose of this activity is to promote and support wide and coordinated deployment of practices and solutions for identified challenges.

This section presents the operational plan for Vital Nodes' activities with Tier 2, including and building on experiences with Tier 1 nodes, and with all 88 nodes of the core network, in Tier 3.

4.1 Deployment to Tier 2

One of the main challenges when developing an operational plan for the deployment to Tier 2 nodes, is to ensure that the discussions revolve around issues of concrete relevance and high-interest to all participants, and, in this way, active engagement is encouraged. Due to diversity among nodes and complexity of the challenges they face, a strategy is needed to identify common ground among participants prior to an activity being held.

Deployment activities will be focused on specific **groups of urban nodes**, with similar contexts. In this way, grouping schemes should respond to the identified challenges. Considering the lessons learned from Tier 1 workshops, as well as the context conditions of the selected Tier 2 members, Vital Nodes suggests following criteria which could guide the grouping process[6]:

1. Seaport urban nodes (Rotterdam, Hamburg, Gothenburg, Genova and Turku)
2. Inland-port urban nodes (Vienna, Budapest, Strasbourg and Mannheim)
3. Cross-border nodal cooperation and functionality of urban nodes (Vienna-Bratislava, Strasbourg)
4. Urban nodes on a common corridor (Rotterdam, Mannheim, Strasbourg and Genova on the Rhine-Alpine corridor)

Nonetheless, the interests from nodes themselves will be taken into account for the definition of grouping schemes and identification of common topics and challenges.

Up to **three webinars** are going to be held with Tier 2 pre-identified contacts. Purpose of the webinars is:

- To explain the project's approach and tools;
- To verify potential participants of each urban nodes;
- To introduce potential grouping and topics;
- To receive feedback on the specific challenges and practices of each node and Tier 2 expectations and interests;
- To present next steps and suggest dates and host cities for the implementation of the workshops

[6] In brackets the grouping is shown for Tier 1 urban nodes.

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All webinars should follow the same format and agenda as we expect not all Tier 2 representatives to be present in one meeting. The target of the webinars is to come to an agreement about the next steps and whom to involve in the follow-up process.

Prior to the webinars, contacts to Tier 2 urban nodes key representatives will be established to arrange participation in the planned process and webinar and to discuss a rough timetable to receive a direct feedback towards the feasibility of the proposed strategy and process. Adjustments content and timewise might be required to ensure motivation, interest and support from local and regional stakeholders. Experiences from the MORO project as well as from the implementation of Tier 1 urban nodes workshop has shown that it could be extremely difficult to align time planning of different local and regional stakeholders. This could be even more challenging when to involve different stakeholders from more than one urban node. Therefore, from the beginning on a realistic and transparent time planning for all partners and stakeholders involved is crucial. For the establishment of contacts with Tier 2 urban node representatives the networks of Polis and EUROCITIES will be involved in the process.

Preparatory steps facilitate the formation of the **three groups** with three cities in each. One carefully moderated and fully funded one-day **workshop** will serve as group-constitution event with five participants per urban node (Σ 15 participants) in one of the three cities**.** During each event, participants representing (freight) transport and spatial planning from the public and private sector will get to know each other to facilitate the growth of a TEN-T nodes “community” (thus contributing to the WP1 objectives) and will be familiarized with context-relevant solutions.

Workshops will be coordinated and held in accordance to Deliverable 3.2: Format for Vital Nodes workshops, which presents a comprehensive guide for the preparation and undertaking of the events. Small adjustments will be done to consider the specific requirements of workshops with a group of nodes.

Moreover, to encourage node integration and ensure continuity of the developments within Vital Nodes, Tier 1 nodes’ representatives will also be invited to participate in Tier 2 workshops. Invitations will be extended to nodes previously identified to have a strong relation to the topic selected for each Tier 2 workshop and it´s participants.

Over the three months following the workshops, one person per city at mayoral or chief officer level, will be encouraged and enabled to visit the two other cities within a respective group for a **one-day visit** during which the host city will present especially its TEN-T solution attempts; the travellers will be interviewed afterwards to document their lessons learned.

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Figure 7 presents the summarised operational plan for Tier 2 deployment[7].

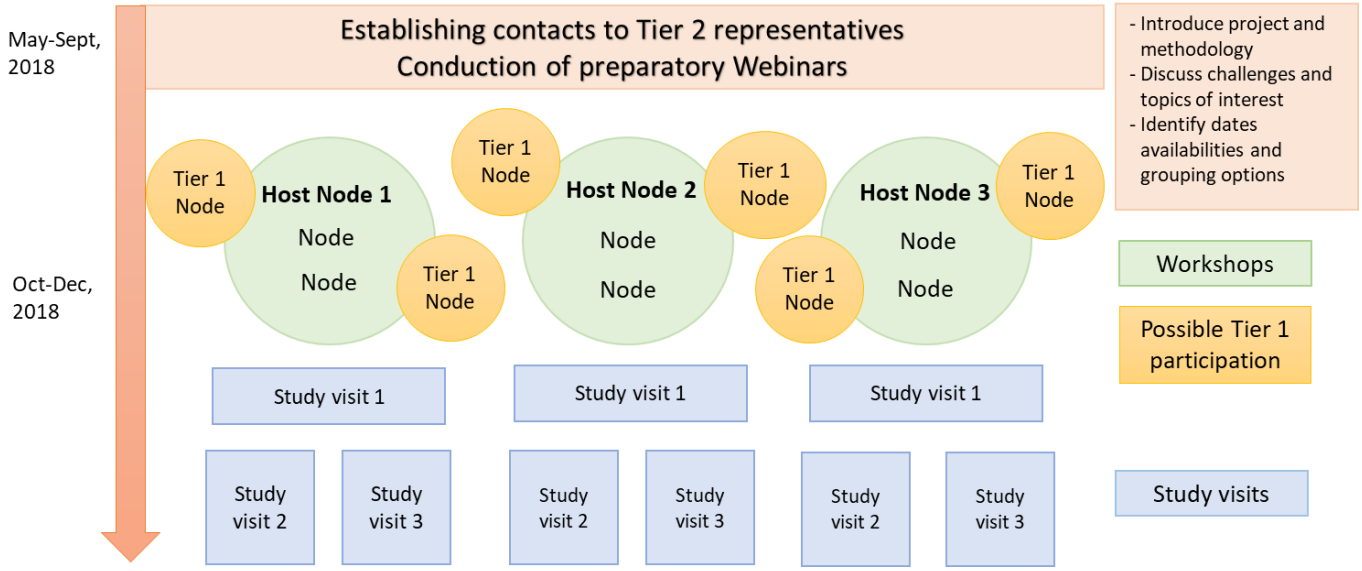

Figure 7: Tier 2 Operational Plan

4.2 Deployment to all 88 urban nodes – Tier 3

Subsequently, target group oriented deployment will widen the network to all 88 urban nodes and facilitates a lively exchange among them along corridor or segment(s) of corridor(s), thematic and/or geographical and/or functional similarities.

For this purpose, another set of seven groups will be formed to ensure actors with similar conditions and interests can exchange their experience, tools, concerns and ideas among peers. Three of these will correspond to the node groups identified for Tier 2, and additional central topics will be selected to the rest. To consider nodes context conditions i.e. perspective, interest and expectation regarding workshop preparation, Vital Nodes will conduct a **survey** directed to all identified stakeholders in Tier 3. This survey shall serve as input for the selection of an adequate grouping scheme and for workshops coordination.

Each group will consist of 10 nodes and will include if feasible one additional member from the Tiers 1 and 2 as group-mentor; the seven mentor cities will get a modest reimbursement for these special efforts.

Set engagement techniques include **one workshop** of one day per group with two attendees[8] of each participating city (Σ20 participants + one mentor city + moderator). Each event will present the Vital Nodes approach, the draft Vital Nodes toolbox, practitioner views and, very importantly, facilitate personal connections between individuals of the urban nodes. This breadth of interactions with all 88 urban nodes

[7] Time planning is still tentative and needs adjustment after having established the contact and dialogue with Tier 2 urban nodes. An updated schedule will be presented after the finalization of the webinars.
[8] There is no database of urban nodes contact ready available. Identification of potential participants need to be established through WP6 activities.

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will enable Vital Nodes to learn about a maximum range of local conditions and thus produce valuable insights.

The personal contacts initiated during the face-to-face events will be further used through five peer teams per group; the team members will be encouraged and reminded to learn from each other through direct peer-to-peer interaction through the review of strategy documents and (self-funded) visits, etc.

To boost the deployment further, a small team of Vital Nodes members will also visit seven cities with a light touring exhibition. Each "**roadshow**" stop will focus on an evening reception with one keynote speech and the explanation of the exhibition, both in the local language. Urban nodes in the proximity of each host city - also member of the comprehensive network – will be specifically invited to also attend this event. The exhibition and roadshow will be executed through WP6.

4.3 Timeline

Figure 8 presents a preliminary timeline for Tier 2 and Tier 3 deployment activities, including Milestones and Deliverables of WP 4.

Tier 2 & Tier 3 Tentative deployment schedule	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	2018									2019					
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Preliminary list of categorised challenges															
Establishing contacts with Tier 2 nodes															
Transferability concept (D4.1)	MS7	D4.1													
Coordination for T2 deployment															
Webinars for Tier 2 nodes															
Definition of Tier 2 grouping															
Workshops with Tier 2 nodes															
Study visits among Tier 2 nodes															
Validated recommendations from Tier 2 (D4.2)								MS11	D4.2						
Survey and definition of Tier 3 grouping															
Workshops with Tier 3 nodes															
Validated recommendations from Tier 3 (D4.3)														MS12	D4.3

Figure 8: Tentative timeline for Tier 2 and Tier 3 deployment

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