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GRETA

Activity 1.2 Jointly developed Territorial needs and gaps

D.1.2.1 Joint methodology for the territorial needs and gaps analysis (TNGA)

Version 2

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GRETA Website

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More information about GRETA can be found on https://www.interreg-central.eu/greta/

1. The GRETA project

GRETA project aims to decarbonize the last mile delivery in Functional Urban Areas (FUAs) in Central Europe (CE) and create liveable and accessible cities for all by 2030. The project seeks to implement joint sustainable solutions in CE FUAs using zero-emission vehicles and cargo bikes and reorganize urban spaces with curb management. The pilot actions in the cities of Maribor, Reggio Emilia, Verona, Poznan, and Budapest (with Berlin FUA as an observer) have the potential to quickly deploy as pop-up measures in combination with existing measures. GRETA provides capacity-building activities, strategies, action plans, and tools for public authorities, enterprises, and relevant organizations to ensure financial, environmental, and social sustainability beyond the project's lifetime.

Last-mile delivery generates negative impacts, including emissions, noise, and congestion. Due to the Covid-19 crisis, global parcel distribution volume almost doubled, further adding inefficiencies in the peripheral areas. GRETA's FUAs recognize the problems that generate pollution, nuisance, noise, and congestion and jointed recognized three main problems: the lack of use of green zero-emission last-mile vehicles, conflicts between freight and public vehicles, and the lack of knowledge and strategies for a flexible and shared use of the curb and public space. Despite having SUMPs/SULPs, FUAs struggle to activate fitting measures while keeping their centres attractive and alive for residents and tourists.

GRETA addresses the common challenges of all CE FUAs by creating the conditions to promote ZE logistics through the use of micro-hubs, cargo bikes, light e-vehicles, and curb management strategies. Additionally, the project also focuses on paving the way to innovative concepts such as regional collaborative logistics, physical internet, and freight curb management. GRETA facilitates the dialogue towards the acceptance of a business and governance as a service model, where cities must equip themselves with a network of innovative services to guarantee seamless experiences for their users and a mobility plan considering different functions and priorities of the services.

GRETA's objective is to support the urban mobility transition in CE FUAs by jointly developing solutions and strategies with a huge potential for decarbonization of the last mile in line with the Green Deal and the Urban Mobility Package, abating congestion, pollution, and nuisance. The project's success relies on capitalizing on previous experiences, exploiting synergies with ongoing initiatives, testing innovative pilots, improving competences and knowledge among PPs and stakeholders.

2. Introduction

Territorial needs and gaps analysis (TNGA) is a key tool in the territorial development process to understand the challenges and opportunities that exist in different geographical areas in the context of transforming urban mobility. This document presents the methodological assumptions that underpin the needs and gap analysis of FUAs. The analysis of territorial needs and gaps requires a thorough methodological approach to obtain reliable results that will provide a solid basis for strategic decision-making as well as further work on the GRETA project.

The report aims to develop a methodology for the identification of main restrictions and gaps at the FUA level for seamless solutions to enable alternative zero and green urban logistics measures.

The document consists of several main parts: definitions referring to indicators related to the specificity of FUAs, the basis of TNGA, a description of the methodological assumptions of the research, development of the TNGA implementation approach (D.1.2.2), as well as a description of the assumptions for the workshops (D.1.2.3.).

3. Key terms

FUA (functional urban areas): comprise cities and their commuting zones. Therefore, functional urban areas consist of a densely inhabited city (a core area) and a less densely populated commuting zone whose labour market is highly integrated with the city [8].

KPI (key performance indicator): critical indicators of progress toward an intended result. KPIs provide a focus for strategic and operational improvement, create an analytical basis for decision making and help focus attention on what matters most.

Research method: an approach to research work characterized by both specific activities (research procedure) and the use of appropriate research tools. The essence of the research method should aim at coordinating the method of proceeding with the assumed research goal [1].

Desk research: a research method that boils down to the analysis of the records of available data sources, including in particular their compilation, mutual verification and processing. Such an analysis is the basis for drawing conclusions about the researched problem [2].

TNGA (territorial needs and gaps analysis): a process of examining and evaluating the existing state of a given territory in order to identify needs and gaps that may require attention and action. Gap analysis is a method of evaluating the parameters of a region to determine whether requirements or objectives are met (in the context of a specific area of performance) and if not, what steps should be taken to meet them. The "gap" in the gap analysis process refers to the space between "where we are" as a part of the business (the present state) and "where we want to be" (the target state or desired state) [6].

SWOT analysis: the name of the method is an acronym of the first letters of the four components. These are strengths, weaknesses, opportunities, and threats. The classic approach is a proposal for a systematic and comprehensive assessment of external and internal factors determining the current condition and development potential [7]. It should be emphasized that strengths and weaknesses are related to the resources and potential of the organization, and opportunities and threats include those occurring in the environment. Therefore, all factors affecting the current and future position of the organization are divided into: external to the organization and having the nature of internal conditions, and having a negative impact on the organization and having a positive impact [3].

4. Basis of terrirorial needs and gaps analysis (TNGA)

4.1. The goal

Activity 1.2 has the goal of investigating the needs and challenges of each FUA concerning mobility and freight, and specifically seamless mobility solutions that enable the path to decarbonisation. This methodology will guide PPs in each specific activity, outlining the relationships between the deliverables.

The territorial needs and gaps will be one document including all FUA's contributions and overall conclusions for this activity. This will support also WP2 and WP3 to identify the possibilities to scale up and to best implement the pilot activities. A.1.2 also includes transnational learning using joint transnational review workshops.

Activity 1.2 will be finalized with three deliverables, that actual one:

- D.1.2.1 Joint methodology for the territorial needs and gaps analysis (TNGA), presenting the methodology for the identification of main restrictions and gaps at FUA level for seamless solutions to enable alternative zero and green urban logistics measures.

and:

- D.1.2.2 Territorial needs and gaps carried out in all the GRETA FUAs, joint report collating all identified needs and challenges, including common key topics and data for up scaling possibilities. Each FUA will outline the state of the art, previous initiatives, future and present challenges and main stakeholders and target groups.
- D.1.2.3 Joint transnational review workshops on TNGAs with all FUAs (JTRW), to analyze and get insights on topics of transnational relevance for PPs and FUAs. All PPs and associated PPs contribute. At least 3 meetings will be organized, the final reports includes minutes and main topics and considerations.

4.2. Functional urban areas [1]

Each functional urban area is an economic unit characterized by densely populated "urban cores" and surrounding areas known as "hinterlands." The labor market within these areas is highly integrated with the urban cores. The population grid from the global dataset Landscan, circa year 2000, is used to define the urban cores. The polycentric cores and hinterlands of the functional areas are identified based on commuting data (travel from home to work), also from around the year 2000 (Census year).

The list of functional urban areas is compiled considering input from European National Statistical Institutes through a consultation initiated by Eurostat in June 2011. The OECD, along with Delegates from the Working Party on Territorial Indicators, also contributes to defining cities. This list of functional urban areas may be subject to revision based on additional comments provided by countries.

GRETA's FUAs represent typical European FUAs of today as they have:

- mix of services concentrated in the city centre, such as universities, commercial activities, offices, restaurants,
- peripheral area that is not included in the main decisions at FUA level,
- road network that is inadequate for the continuously growing population,

[1] Based on [8]

- general lack of public space which is requested by city users, HoReCa (hotels, restaurants, cafes) and other mobility services.

In particular, GRETA's FUAs are listed below:

1. Maribor (Slovenia) - SI002
2. Reggio Emilia (Italy) - IT505
3. Verona (Italy) - IT012
4. Budapest (Hungary) - HU001
5. Poznan (Poland) - PL005
6. Berlin Brandeburg area (Germany) as observer - DE001

The objective of the GRETA project is to support the urban mobility transition in FUAs by jointly developing solutions and strategies with huge potential for decarbonization of the last mile, in line with the Green Deal & the Urban Mobility Package, abating congestion, pollution, and nuisance. To achieve this objective, previous experiences will be capitalized and synergies with ongoing activities will be exploited. GRETA follows up on the legacy of the Interreg Central Europe project SULPiTER, also coordinated by ITL, that allowed FUAs to develop their own Sustainable Logistics Plan, by establishing urban freight pilot actions. These pilot actions will be conducted within the above-mentioned FUAs and will have to establish a Freight Quality Partnership each. Before doing that, it is very important to map and define the FUA's mobility stakeholders.

4.3. FUA introduction data

To determine the current situation of the FUAs the following set of data will be collected (see table 1).

Table 1. FUA introduction data

Please, briefly describe the urban mobility environment in the FUA responding to the following
Location within the country *(if possible use a map)*
Describe, please.
OECD classification[2]
State, please.
Main urban mobility & logistics challenges faced
Describe, please.
Main objectives of FUA in scope of the urban mobility and local freight
Describe and add info about the source, please.
The KPI / indicators collected so far
State and describe, please.
The main issues in the distribution of freight in the FUA?
Congestion yes/no *Short description, KPIs?*

[2] https://www.oecd.org/cfe/regionaldevelopment/Definition-of-Functional-Urban-Areas-for-the-OECD-metropolitan-database.pdf

Please, briefly describe the urban mobility environment in the FUA responding to the following
Air pollution yes/no *Short description, KPIs?* Noise pollution yes/no *Short description, KPIs?* Other (could be more than one): which *Short description*
A sustainable urban mobility plan in effect or preparation
Please, specify if it is in preparation or in effect (when was it released or updated?). *Please provide the main assumption of the plan.* *Please provide a link to the plan if available.*
Major urban transport investments (services, policies, and infrastructure) finished in the last 3 years
Short description
Major urban transport investments (services, policies, and infrastructure) currently in progress
Short description
Major urban transport investments (services, policies, and infrastructure) planned
Short description
Territorial gaps identified before GRETA project initiation
Short description
Territorial needs identified before GRETA project initiation
Short description

5. Methodological assumptions

Developing the methodological assumptions of the research is a key element of the planning process and then the implementation of the research. Correctly developed methodological assumptions ensure consistency, credibility, and repeatability of research results.

As part of the description of the methodological assumptions, the following elements were included: purpose of research and research problems, research methods and description of tools, organization and course of research, and research limitations.

5.1. Purpose of research and research problems

The purpose of research is identification of the main restrictions and gaps at FUA level for seamless solutions to enable alternative zero and green urban logistics measures.

Based on the above purpose, the following research questions were formulated:

- What are the characteristics of individual FUAs?
- What are the current and future challenges of FUAs in the context of seamless solutions to enable alternative zero and green urban logistics measures?
- What initiatives have been implemented previously in the context of seamless solutions to enable alternative zero and green urban logistics measures?
- What are the main stakeholder groups and target groups in the analyzed FUAs?

5.2. Mapping of FUAs mobility stakeholders[3]

The engagement of stakeholders is a continuous and systematic process by which an organization establishes a constructive dialogue and fruitful communication with its key stakeholders. The purpose of involvement is to convey to decision-makers the expectations and interests of stakeholders so that they can take them into account. The involvement, providing input to power management processes and assessing the impact of operations on those who are affected, becomes a guiding element for learning and changing across the organization. Its added value lies in the creative search for solutions that best fit the specific social and environmental context, in the possibility of a confrontation on the field, and in the monitoring of the transformation of social relations among all the players involved.

The stakeholders that will be involved will have to be relevant, i.e., they should be a group of individuals or organizations that affect and/or could be affected by an organization's activities, products, or services and by the associated performance about the issues addressed by the engagement. An organization may have many stakeholders, each with distinct attributes and often with diverse and conflicting interests and concerns. Establishing a methodology for systematically identifying stakeholder groups that can contribute to achieving the purpose of the engagement and/or could be affected by its outcome is fundamental to the engagement process.

Talking about FUAs specifically, it is important to identify urban mobility stakeholders and understand if their potential role and position in the process matter to achieve the overall goals of sustainable urban mobility planning.

[3] Based on [8]

Mapping FUAs mobility stakeholders means identifying all relevant stakeholders as well as their objectives, power, and capacities influencing freight transport in each FUA, that need to be included in the process of development of the Sustainable Urban Logistic Plans (SULPs). Participation of stakeholders is needed for:

- Knowing the stakeholders,
- Knowing and understanding the problem,
- Considering options and their feasibility,
- Accepting results and measures,
- Taking part in the workshops (representatives of the groups of stakeholders).

To obtain a comprehensive picture, there are two main types of stakeholders that need to be identified: public authorities and private stakeholders in each FUA, influencing freight transport from a policy & business or transport flow perspective.

Public sector stakeholders

For the stakeholders belonging to the public sector, it is important to identify:

- town/regional planners, transport specialists, or, where existing, public logistics specialists,
- infrastructure and (public) service providers,
- Sectoral agencies and similar .

When analysing potential stakeholders, there is the need to identify which relevant responsibility is in which authority.

Private sector stakeholders

For the stakeholders belonging to the private sector, it is important to identify:

- Logistics companies (general cargo, parcel deliveries, etc.) – companies important for the FUA freight transport (big or SMEs),
- Logistics association and goods transport association,
- Industry associations – within the industry that are causing a significant part of goods transport,
- Trade association – also causing significant workload in goods delivery and logistics important for FUA,
- Infrastructure and (public) service providers etc.
- Non-government organizations, with the field of interest of urban mobility.

When analysing potential stakeholders, it is important to define the associations represented, the strength and importance of the stakeholder as well as the influence it has on urban freight transport.

5.3. Research methods and description of tools

As part of the study, two research methods will be used. The leading one will be TNGA (detailed description - see chapter *5.4 Territorial needs and gaps analysis (TNGA) - approach description*). A supporting method will be desk research - used in the context of searching for information and data for the indicators covered by the analysis.

5.4. Territorial needs and gaps analysis (TNGA) – approach description

TNGA focuses on identifying the factors that are relevant to the development of a given area. It may include a study of infrastructure, the availability of public, economic, and social services, as well as an assessment of the natural environment. The purpose of the needs analysis is to determine which areas need improvement or investment to meet the needs of the inhabitants and develop the region.

On the other hand, territorial gap analysis is about identifying gaps and shortcomings in a given area. These may be areas where there is a shortage of infrastructure, public services, jobs, or other factors important for socio-economic development. Gap analysis aims to detect areas where corrective actions or investments need to be made to increase the quality of life of residents and the sustainable development of the territory.

As a result, the Territorial Needs and Gap Analysis (TNGA) provides the information and tools necessary to make decisions on territorial development. It helps in identifying priorities, allocating resources, and planning activities to meet the needs of the community and ensure the sustainable development of the area.

Gap analysis is the process of comparing the current state with the desired future state. This process involves evaluating the current performance to determine whether the stated goals are being met and, if not, creating an action plan to fill the identified gap. The idea of TNGA is presented in figure 1.

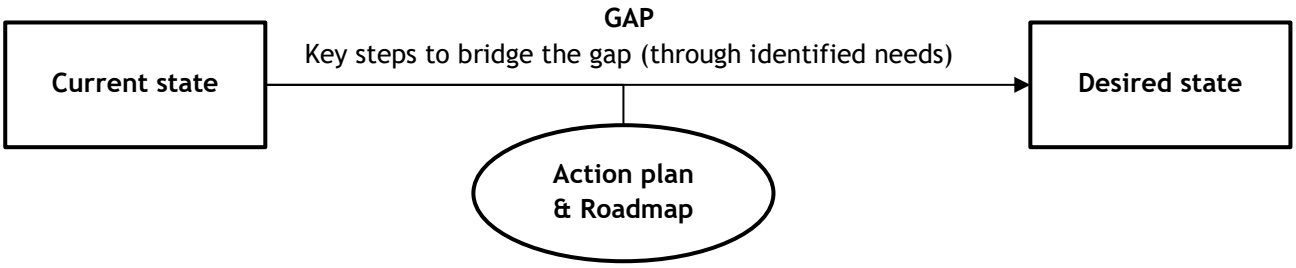

Figure 1. The idea of Territorial need and gap analysis [10]

The described approach is commonly used in management sciences and can be used both as an element of strategic management in organizations, but also to assess the condition of regions and their possible development opportunities.

The method itself can be implemented in several stages. In the literature on the subject, many approaches are indicating a different number of stages that can be adapted to current needs and own approach (while maintaining a certain analytical framework) [3] [4] [6].

As part of the assumptions for the TNGA analysis carried out in the GRETA project, the following stages can be identified:

1. Defining the goals and scope of the analysis.
2. Data collection and data analysis.
3. Identification of territorial gaps and needs.
4. Prioritization analysis and action planning (Roadmap).

The individual steps are described below.

5.4.1. Defining the goals and scope of the analysis

The aim is to collect assumptions for the development of a joint report containing all identified needs and challenges, including common key topics and data on the possibility of scaling up FUAs for seamless solutions to enable alternative zero and green urban logistics measures.

The scope of the TNGA analysis will be as follows:

- Basic parameters of the FUA.
- Main urban mobility & logistics challenges faced.
- The main issues in the distribution of freight in the FUA.
- A sustainable urban mobility plan in effect or preparation.
- Major urban transport investments (services, policies, and infrastructure) finished in the last 3 years.
- Major urban transport investments (services, policies, and infrastructure) are currently in progress.
- Major urban transport investments (services, policies, and infrastructure) planned in the next 3 years.
- Territorial gaps identified before GRETA project initiation.
- Territorial needs identified before GRETA project initiation.

5.4.2. Data collection and data analysis

The next step is to analyze the current state by collecting relevant data on the level of development of FUAs. It should be noted that a wide range of data will be used in the analysis.

This data will be collected from the relevant documentation, policies, and development strategies of regions and cities. Data on investments in the field of transport, strategic assumptions for the development of urban mobility, and ambitions related to the green transformation of transport.

In addition, data will be collected for defined key performance indicators (KPIs). The indicators have been divided into three groups: Basic parameters of the FUA (mostly indicators), Freight transport, and Zero and green urban logistics measures – table 2.

Table 2. Defined key performance indicators / KPIs

Categories of (key performance) indicators (KPI)	List of (key performance) indicators / KPIs
Basic parameters of the FUA	Area *[sqkm]*
	Population *[inh]*
	Population growth rate *[%]*
	Population density *[inh/sqkm]*
	Number of subzones *[pcs]*
	Average yearly public expenditure *[kEUR]*
	Average yearly public investments *[kEUR]*
	Length of road network *[kkm]*
	Length of railways *[kkm]*

Categories of (key performance) indicators (KPI)	List of (key performance) indicators / KPIs
	Length of water ways *[kkm]* Number of legal entities *[pcs]*
Freight transport	Average Delivery Time *[h]* Density of roads *[km/sqkm]* CO_2 emissions (or its equivalent) related to the transport sector *[%]* Freight kilometers driven *[kkm]* Number of reloading bays *[pcs]* Volume of cargo supplies daily [*m3]* Number of cargo trips daily *[pcs]* Share of supplies by cargo size (by volume): - FTL *[%]* - Pallets *[%]* - Parcels *[%]* - Letters *[%]*
Zero and green urban logistics measures	Share of low emission freight / total freight *[%]* Share of any cargo transport limitation zones area (time limitation, green transport zones etc.) [‰] Availability of electric vehicle charging stations [*pcs/sqkm]* Investments in sustainable transport[4] *[*kEUR *per capita]* Investments in green initiatives[5] *[*kEUR *per capita]*

The KPIs are detailed in the appendix.

Indicators from the zero and green urban logistics measures category will be categorized and based on their values (estimated arithmetic mean for all FUAs areas, and then determining the single average value of the region), the assessment of a given FUS will be determined, along with its level of development of zero and green urban logistics.

Assignment to individual levels will be based on calculations carried out in three stages:

1. First, the average value for all FUAs will be calculated for each of the five indicators from the Zero and green urban logistics measures group.
2. Then, within a given FUA, the values of individual indicator values will be related to the estimated arithmetic mean of a given indicator for all FUAs (FUA indicator value/value of the arithmetic mean for the indicator from all FUAs).

[4] Investments in sustainable transport are financial resources and activities undertaken to develop and promote transport systems that minimize the negative impact on the natural environment, society and the economy.

[5] Green investments in urban areas are financial and design activities aimed at improving the quality of life in cities, minimizing the negative impact on the environment and supporting sustainable urban development. These investments focus on creating greener, energy-efficient and citizen-friendly environments. They concern environmental protection, energy efficiency, waste management, renewable energy, and spatial planning.

3. In the last stage, having calculated the share of individual Zero and green urban logistics measures indicators for a given FUA in the average calculated for all FUAs, the average for all FUA indicators will be calculated - which will give a percentage share in the average value for all FUAs.

The following parameters will be used to determine the zero and green urban logistics development levels[6]:

- innovation leaders of zero and green urban logistics (results above 125% of the average FUAs);
- strong innovators zero and green urban logistics (results in the range of 100-125% of the average FUAs);
- moderate innovators zero and green urban logistics (70-100% of average FUAs);
- emerging innovators zero and green urban logistics (below 70% of average FUAs).

Important:

- *only indicators available in minimum 2 FUAs (with comparable units) will be taken info consideration / comparison.*
- *in case of identification of other KPIs, calculated by minimum 2 FUAs, the above list can be supplemented.*

Data analysis refers to the compilation of KPIs, the development of basic statistics (arithmetic mean), along with the use of visualization in the form of tables and charts.

5.4.3. Identification of territorial gaps and needs

Identification of gaps and territorial needs will be carried out using SWOT, which is an algorithm for the strategic analysis process, a proposal for a systematic and comprehensive assessment of internal and external factors determining the current condition and future development needs of zero and green urban logistics in the selected regions.

It should be noted that the SWOT analysis is a commonly used tool in this type of analysis [3] [4] [6]. However, due to the specific needs of the FUAs assessment, as well as the requirements of the GRETA project, the SWOT analysis was adapted to these conditions. The assumptions for using the SWOT analysis in the TNGA approach are described below.

The SWOT analysis is based on the classification of zero and green urban logistics factors into four categories:

- Advantages (internal positive).
- Disadvantages (inner negative).
- Opportunities (external positive).
- Threats (external negative).

The list of factors will be developed based on the analysis of KPIs for individual FUAs, analysis of strategic documents, development strategies, policies, and investments related to sustainable transport, as well as environmental analysis (PEST - Political, Economic, Social, Technological).

[6] The level parameters adopted correspond to the approach used in the ranking of European Innovation Scoreboard, https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard_en access 2023-09-07

The factors identified in the SWOT analysis in the context of TNGA analysis are aimed at determining the current state of zero and green urban logistics, but also specific challenges and opportunities within FUAs. In GRETA project the SWOT analysis (factors identification) should cover:

- performance gap analysis, evaluating the difference between FUAs current performance and its desired future state to identify areas for improvement and enhance overall efficiency and effectiveness of support in decarbonization of the last mile delivery,
- services gap analysis: assessing the features, pricing, and qualities of a FUAs service / support against citizens and freight operators needs and expectations to identify gaps and prioritize improvements or innovations,
- technology gap analysis, focusing on FUAs' technology infrastructure, systems, and capabilities, comparing them with the technology required to support its freight operators in greening the local supplies,
- environmental and social gap analysis: evaluating a FUAs' environmental and social impact, identifying gaps in sustainability practices and providing insights for implementing responsible and eco-friendly strategies.

Then they will be presented in tabular form - table 3.

Table 3. SWOT analysis – list of analyzed factors

Advantages	Disadvantages
$Factor_1$	$Factor_1$
$Factor_2$	$Factor_2$
….	….
$Factor_n$	$Factor_n$

Opportunities	Threats
$Factor_1$	$Factor_1$
$Factor_2$	$Factor_2$
….	….
$Factor_n$	$Factor_n$

The next stage (after identifying all factors) is defining the strategic position (framework for roadmap) for the development of zero and green urban logistics in a specific FUA. It is necessary to determine how important each factor is.

This will be estimated based on the weighted average:

- determination of the importance of the factor (in the form of decimal fractions, the sum of which within one category is 1),
- evaluation of the strength of a given factor on a 5-point scale (positive factors on a positive scale and negative ones on a negative scale).

The last step is to multiply the weights and ratings and sum them up for each category separately. The procedure is presented in table 4.

Table 4. Estimation of the strategic position of the FUA

Category of factor	Factor	Importance of the factor	Strength of factor	Weighted average
Advantages	$Factor_1$ $Factor_2$ …. $Factor_n$	Fractional values of individual factors within a category should add up to 1	On a scale of 1 to 5, where 1 is the lowest and 5 is the highest	Multiplying the weights and ratings and adding them up for each category separately.
			Total	
Disadvantages	$Factor_1$ $Factor_2$ …. $Factor_n$	Fractional values of individual factors within a category should add up to 1	on a scale of -1 to -5, where -1 is the lowest and -5 is the highest	Multiplying the weights and ratings and adding them up for each category separately.
			Total	
Opportunities	$Factor_1$ $Factor_2$ …. $Factor_n$	Fractional values of individual factors within a category should add up to 1	On a scale of 1 to 5, where 1 is the lowest and 5 is the highest	Multiplying the weights and ratings and adding them up for each category separately.
			Total	
Threats	$Factor_1$ $Factor_2$ …. $Factor_n$	Fractional values of individual factors within a category should add up to 1	on a scale of -1 to -5, where -1 is the lowest and -5 is the highest	Multiplying the weights and ratings and adding them up for each category separately.
			Total	

After parameterization of individual factors, it is possible to determine the strategic position of FUA. This is done based on summing up the obtained weighted average values of internal factors (advantages and disadvantages) and external factors (opportunities and threats).

Depending on the results obtained, the strategic position may fall into one of four areas - a framework for a roadmap for achieving seamless solutions to enable alternative zero and green urban logistics development (figure 2).

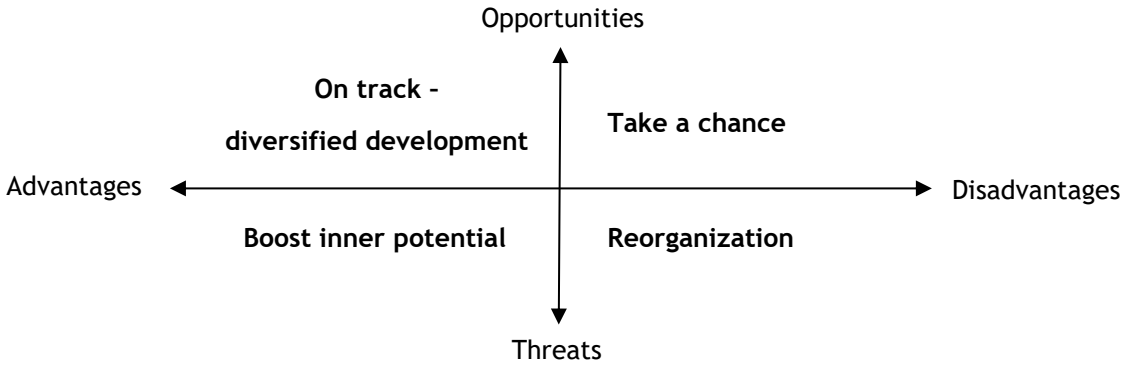

Figure 2. Framework for roadmap for achieve seamless solutions to enable alternative zero and green urban logistics development [10]

Depending on the completed assessment of the strategic position, it is possible to find yourself in one of four fields that are related to a specific approach to the development of zero and green urban logistics:

- **On track - diversified development**: this is a situation where both advantages and opportunities outweigh. This is a favorable arrangement in which it is possible to implement diversified activities in the implementation of the assumptions of sustainable transport. It is recommended to maintain the current approach, strategic assumptions and implementation of policies relating to green and low-emission transport.
- **Take a chance**: it is a situation in which both the disadvantages and the opportunities of the environment prevail at the same time. It is recommended to take advantage of opportunities (especially those with the highest rating), while reducing or correcting shortcomings. It is necessary to review and intensify activities that will ensure the development and sustainability of transport in the urban area.
- **Boost inner potential**: it is a situation in which advantages and threats outweigh. The recommendation refers to countering threats by using numerous and highly rated assets. Opportunities to further strengthen strengths and steer the development of green and low-carbon transport should be considered.
- **Reorganization**: this is the least advantageous situation - both disadvantages and threats prevail. It is recommended to reconstruct the approach relating to the development of green and low-emission urban transport. Possible actions include updating/developing a regional development strategy, developing policies, financing relevant activities, and developing actions aimed at minimizing identified defects.

5.4.4. Prioritization analysis and action planning (Roadmap)

Creating a gap analysis leads to the crucial step of formulating an action plan and roadmap to address the identified gaps.

Based on the estimated strategic position - one of the four frameworks. In particular, it is important not to eliminate defects, as well as to take advantage of opportunities.

Then developing a program for the development and implementation of zero and green urban logistics.

5.5. Organization and course of research

As part of the study, several of methods were used depending on the stage of the study (preparation, implementation, and results processing):

- Research preparation phase: in this phase, the aim of the study and research questions were developed. The research methods used were defined: TNGA (as the leading method – see point 6. Territorial needs and gaps analysis (TNGA) – approach description) and desk research (as a supporting method).
- Research implementation phase - TNGA analyzes of individual FUAs regions will be carried out, based on the adopted assumptions. Templates have also been developed for reports developed as part of later activity 1.2 tasks:
  - D.1.2.2. Territorial needs and gaps carried out in all the GRETA FUAs.
  - D.1.2.3. Joint transnational review workshops on TNGAs with all FUAs (JTRW).
- Results analysis phase - the analysis of the test results will be developed based on elements of descriptive statistics, such as the arithmetic mean, the structure of responses, along with graphical visualization in the form of charts and tables.

5.6. Research limitations

Territorial Needs and Gaps Analysis is an important tool in planning the development of territorial areas. However, there are some limitations related to the specificity of such a study. On the one hand, it can be pointed out that the analysis of territorial needs and gaps is based on access to data, which can often be difficult to obtain or incomplete. Lack of access to relevant data can make it difficult to accurately assess needs and gaps in a given area. On the other hand, it should be noted that there are no clear indicators or criteria for assessing territorial needs and gaps, which may make it difficult to determine which areas require priority support.

6. Workshops

6.1. Basic workshop overview

The aim of the workshop is identification to identify stakeholder groups' needs and discuss the way the needs can be addressed (gaps). The workshop is initiated by the presentation of all FUAs comparisons, to support and initiate the process (e.g. brainstorm) of local TNGA identification.

The FUAs comparison will be on local investment and plans, on the background of supplied data, to give an overview of other FUAs' situation and their reaction in similar situations.

The workshop will start with preliminary information about:

- present situation in the other project's FUAs,
- present the state-of-art solutions (examples)
- case studies (other FUAs experience) presentation.

The workshop should be organized offline in the local language, but with the possibility of presentation (especially the case studies) online.

6.2. Case studies description

Based on the earlier identified needs and gaps addressed by the FUAs the case studies will be prepared by each FUA, to support addressing similar needs in other FUAs. In case of the possibility of presenting more than one case study, other FUAs will decide which one is most appropriate. The case studies presentation will initiate every workshop.

The case study presentation should include: i) identified need/gap, ii) considered ways of addressing the need/gap, iii) implemented solution short description, vi) a description of the implementation, v) real results of the solution, vi) lessons learned (altogether 5 slides).

6.3. The aims of the workshop

The aims of the workshop include:

- identification of the gaps in FUAs,
- identification of the FUAs challenges,
- prioritization of gaps and challenges,
- possible solution identification, mainly of high-ranking issues,
- identified solutions verification,
- indications of main guidelines for implementation recommendation.

6.4. Expected participants

The participants should represent every (group of) stakeholders, identified during the activity conduction. The meeting should be open for non-government organizations too, interested in the subject of the workshop.

6.5. Workshop report

The results of the workshop should be presented in the form of a report/minutes expressing: the workshop objectives achieved, including mainly the proposed activities, but also identified gaps and unaddressed needs identified by workshop participants.

The report should be forwarded to the relevant management departments of the FUAs, guiding further developments and investments.

6.6. Workshop promotion and dissemination

Apart from invited representatives of stakeholders, the workshop will be open to representatives of a broad spectrum of non-governmental organizations (NGOs) that express concern for the urban environment in their activities within the FUA. A mailing campaign will be prepared to invite them to the workshops, to reach a wide audience. Desk research with identification of NGOs will be necessary.

Also, the results of all workshops, once translated into the local language, will be distributed electronically to interested participants as representatives of the respective institutions and communities (including stakeholders).

7. References

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8. Appendix

8.1. The KPI calculation methods

KPI name	Average delivery time
KPI description	**The average time of deliveries in the FUA area**
Formula to calculate KPI:	**sum of measured time of deliveries / number of measures**
Unit	**Hours [h]**
Current Value	*Introduce the value after calculation*
Data Source	*Specify the data sources for all the parameters the KPI requires*
Geographic aggregation level	*Indicate the spatial unit for the indicator and sub-indicators: e.g. part of the city, city, region, whole FUA*
Responsible	*Specify which organization is in charge of providing the data, if any*
Date & Frequency	*Indicate: i) the year when the latest data is available and ii) the frequency of data collection (monthly, yearly, every 2 years etc.), if any*
Notes & comments	*Any additional comments.*

KPI name	Density of roads
KPI description	**Total length of roads in the FUA area in relation to its area**
Formula to calculate KPI:	**Total length of road network / area of FUA**
Unit	**Kilometers / square kilometers [km/sqkm]**
Current Value	*Introduce the value after calculation*
Data Source	*Specify the data sources for all the parameters the KPI requires*
Geographic aggregation level	*Indicate the spatial unit for the indicator and sub-indicators: e.g. part of the city, city, region, whole FUA*
Responsible	*Specify which organization is in charge of providing the data, if any*
Date & Frequency	*Indicate: i) the year when the latest data is available and ii) the frequency of data collection (monthly, yearly, every 2 years etc.), if any*
Notes & comments	*Any additional comments.*

KPI name	CO_2 emissions (or its equivalent) related to the transport sector
KPI description	**The ratio of the amount of carbon dioxide equivalent emitted from transport activities to the total amount of carbon dioxide emissions in the FUA**
Formula to calculate KPI:	**eCO_2 emission by transport in tons / whole area of FUA eCO_2 emission in tons**
Unit	**Percent [%]**
Current Value	*Introduce the value after calculation*
Data Source	*Specify the data sources for all the parameters the KPI requires*
Geographic aggregation level	*Indicate the spatial unit for the indicator and sub-indicators: e.g. part of the city, city, region, whole FUA*
Responsible	*Specify which organization is in charge of providing the data, if any*

Date & Frequency	*Indicate: i) the year when the latest data is available and ii) the frequency of data collection (monthly, yearly, every 2 years etc.), if any*
Notes & comments	*Any additional comments.*

KPI name	Volume of cargo supplies
KPI description	**Average total volume of cargo daily**
Formula to calculate KPI:	**Daily average measured / calculated / estimated volume of cargo daily including supplies / deliveries of goods and returnable packages**
Unit	**Cubic meters [m3]**
Current Value	*Introduce the value after calculation*
Data Source	*Specify the data sources for all the parameters the KPI requires*
Geographic aggregation level	*Indicate the spatial unit for the indicator and sub-indicators: e.g. part of the city, city, region, whole FUA*
Responsible	*Specify which organization is in charge of providing the data, if any*
Date & Frequency	*Indicate: i) the year when the latest data is available and ii) the frequency of data collection (monthly, yearly, every 2 years etc.), if any*
Notes & comments	*Any additional comments.*

KPI name	Freight kilometers driven
KPI description	**Average total distance driven by cargo vehicles daily**
Formula to calculate KPI:	**Daily average measured / calculated / estimated distance driven by cargo vehicles daily (workdays only)**
Unit	**Thousand kilometers [km]**
Current Value	*Introduce the value after calculation*
Data Source	*Specify the data sources for all the parameters the KPI requires*
Geographic aggregation level	*Indicate the spatial unit for the indicator and sub-indicators: e.g. part of the city, city, region, whole FUA*
Responsible	*Specify which organization is in charge of providing the data, if any*
Date & Frequency	*Indicate: i) the year when the latest data is available and ii) the frequency of data collection (monthly, yearly, every 2 years etc.), if any*
Notes & comments	*Any additional comments.*

KPI name	Number of cargo trips
KPI description	**Average total number of cargo trips daily**
Formula to calculate KPI:	**Daily average measured / calculated / estimated number of cargo trips daily (workdays only)**
Unit	**Thousand kilometers [kkm]**
Current Value	*Introduce the value after calculation*
Data Source	*Specify the data sources for all the parameters the KPI requires*
Geographic aggregation level	*Indicate the spatial unit for the indicator and sub-indicators: e.g. part of the city, city, region, whole FUA*
Responsible	*Specify which organization is in charge of providing the data, if any*

KPI name	Number of cargo trips
Date & Frequency	*Indicate: i) the year when the latest data is available and ii) the frequency of data collection (monthly, yearly, every 2 years etc.), if any*
Notes & comments	*Any additional comment.*

KPI name	Share of supplies by cargo size
KPI description	**Breakdown of flows by type of delivery volume**
Formula to calculate KPI:	**FTL volume / total volume** **pallets volume / total volume** **parcels volume / total volume** **letters volume / total volume** **Measured / calculated / estimated values of delivery volumes from any period of time. Total must be 100%.**
Unit	**Percent [%]**
Current Value	*Introduce the value after calculation*
Data Source	*Specify the data sources for all the parameters the KPI requires*
Geographic aggregation level	*Indicate the spatial unit for the indicator and sub-indicators: e.g. part of the city, city, region, whole FUA*
Responsible	*Specify which organization is in charge of providing the data, if any*
Date & Frequency	*Indicate: i) the year when the latest data is available and ii) the frequency of data collection (monthly, yearly, every 2 years etc.), if any*
Notes & comments	*Any additional comments.*

KPI name	Share of low emission freight / total freight
KPI description	**Share of low- and zero-emission freight transport in total freight transport**
Formula to calculate KPI:	**Number of zero- and low- emission delivery vehicles / total number of delivery vehicles operating in FUA**
Unit	**Percent [%]**
Current Value	*Introduce the value after calculation*
Data Source	*Specify the data sources for all the parameters the KPI requires*
Geographic aggregation level	*Indicate the spatial unit for the indicator and sub-indicators: e.g. part of the city, city, region, whole FUA*
Responsible	*Specify which organization is in charge of providing the data, if any*
Date & Frequency	*Indicate: i) the year when the latest data is available and ii) the frequency of data collection (monthly, yearly, every 2 years etc.), if any*
Notes & comments	*Any additional comments.*

KPI name	Share of any cargo transport limitation zones area
KPI description	**Share of zones area with permanent limitation of entry for a high emission vehicles or time limitation for all delivery vehicles to the total area of FUA**

Formula to calculate KPI:	**Area of zones with above limitation / total area of FUA**
Unit	**Promil [‰]**
Current Value	*Introduce the value after calculation*
Data Source	*Specify the data sources for all the parameters the KPI requires*
Geographic aggregation level	*Indicate the spatial unit for the indicator and sub-indicators: e.g. part of the city, city, region, whole FUA*
Responsible	*Specify which organization is in charge of providing the data, if any*
Date & Frequency	*Indicate: i) the year when the latest data is available and ii) the frequency of data collection (monthly, yearly, every 2 years etc.), if any*
Notes & comments	*Any additional comments.*

KPI name	**Availability of electric vehicle charging stations**
KPI description	**Number of electric cars charging stations on the area of FUA ratio**
Formula to calculate KPI:	**Number of electric cars charging stations / total area of FUA**
Unit	**Pieces per square kilometer [pcs/sqkm]**
Current Value	*Introduce the value after calculation*
Data Source	*Specify the data sources for all the parameters the KPI requires*
Geographic aggregation level	*Indicate the spatial unit for the indicator and sub-indicators: e.g. part of the city, city, region, whole FUA*
Responsible	*Specify which organization is in charge of providing the data, if any*
Date & Frequency	*Indicate: i) the year when the latest data is available and ii) the frequency of data collection (monthly, yearly, every 2 years etc.), if any*
Notes & comments	*Any additional comments.*

KPI name	**Investments in sustainable transport**
KPI description	**Financial resources and activities undertaken to develop and promote sustainable transport systems that minimize the negative impact on the natural environment, society and the economy**
Formula to calculate KPI:	**Total investments as stated above / total number of inhabitants**
Unit	**Thousand EUR / number of citizens [kEUR per capita]**
Current Value	*Introduce the value after calculation*
Data Source	*Specify the data sources for all the parameters the KPI requires*
Geographic aggregation level	*Indicate the spatial unit for the indicator and sub-indicators: e.g. part of the city, city, region, whole FUA*
Responsible	*Specify which organization is in charge of providing the data, if any*
Date & Frequency	*Indicate: i) the year when the latest data is available and ii) the frequency of data collection (monthly, yearly, every 2 years etc.), if any*
Notes & comments	*Any additional comments.*

KPI name	Investments in green initiatives
KPI description	**Green investments in urban areas are financial and design activities aimed at improving the quality of life in cities, minimizing the negative impact on the environment and supporting sustainable urban development. These investments focus on creating greener, energy-efficient and citizen-friendly environments. They concern environmental protection, energy efficiency, waste management, renewable energy, and spatial planning.**
Formula to calculate KPI:	**Total investments as stated above / total number of inhabitants**
Unit	**Thousand EUR / number of citizens [kEUR per capita]**
Current Value	*Introduce the value after calculation*
Data Source	*Specify the data sources for all the parameters the KPI requires*
Geographic aggregation level	*Indicate the spatial unit for the indicator and sub-indicators: e.g. part of the city, city, region, whole FUA*
Responsible	*Specify which organization is in charge of providing the data, if any*
Date & Frequency	*Indicate: i) the year when the latest data is available and ii) the frequency of data collection (monthly, yearly, every 2 years etc.), if any*
Notes & comments	*Any additional comments.*