Green Inland Ports

D2.2 Potential for urban mobility and short-range IWT

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Introduction

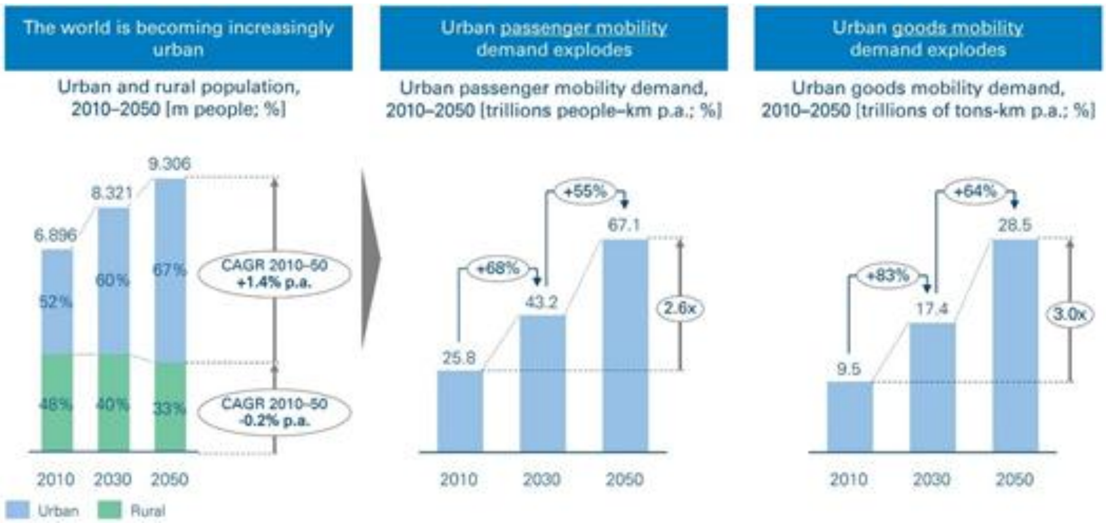
1.0 Introduction

Urban mobility and short-range IWT

This Deliverable 2.2 focuses on task 2.3 of the Green Inland Ports study assessing the quantitative roll-out-potential of urban and short-range inland waterway transportation (IWT). As part of the sustainable management and development of inland ports the potential for adoption of inland waterway transport beyond traditional purposes in urban environments and over short distances is analysed.

There is a strong need to find sustainable solutions for urban mobility of passengers and freight, considering the expected growth of these segments in the coming years, as presented in Figure 1.1. The increasing urbanisation will further increase the transport volumes in cities.

Figure 2.1 Increased urbanization and its impact on passenger and goods mobility demand



Source: UN, World Bank, OECD, ITF, Schäfer/Victor 2000, Cosgrove/Cargett 2007, Arthur D. Little

Smart concepts and business models are needed for the establishment of new markets for urban and short-range inland waterway transport. Analysing the traditional inland waterways transport structures, there is a large potential for the development of these market segments, also considering the opportunity of unmanned (small) vessels to serve these areas. However, due to the handling in ports, business cases and competition with other modes are challenging for short-range IWT. The growing need for resource efficient transport and congestion of (urban) road networks and protection of inner cities with cultural heritage led to an increasing potential in this market segment. This applies both for freight transport, where for instance increasing parcel deliveries from distribution centres moving to the outskirts of cities increase truck transport, and passenger transport, where waterborne concepts can contribute to modal shift from road to public transport as well as reduce emissions through the use of electric vessels. Moreover, it includes last mile operation in the hinterland of ports where efficient solutions can strengthen the sustainability. The use of urban and short-range IWT will allow to reduce urban congestion which is estimated to create an economic loss EUR 180 billion per year.[1]

Various creative solutions exist already, and this analysis will contribute to their development and further maturing to contribute to a transfer of short-range IWT solutions to other locations. The results of the analysis, highlighting valuable insights, will allow to fully exploit the potential of inland navigation for the modal shift of road transport. A further exploitation of the potential of urban and short-range IWT is in line with the European Green Deal objectives to shift 75% of inland freight transport from road to rail and inland waterways.[2] Moreover, considering economic change and the breakaway of traditional markets for inland navigation, these new markets are crucial to avoid a cutback of IWT market shares and with this a lower contribution of inland ports to sustainability.

Now is a good moment to implement new services. After the COVID crisis, the attitude of the population in urban areas is changing. A survey in Brussels learned that silence was the most appreciated effect of the crisis. Silence caused by fewer cars, fewer trucks and less air transport. Closely followed by the second positive effect of less cars and trucks, which created more safety and space for pedestrians and bikers. The better air quality was the third very well appreciated effect.

Consequently, there is a common understanding that traffic problems in urban areas cannot be solved only by implementation of alternative fuels. Consequently, it can be expected that changes in rules and regulations will support a modal shift and (hopefully) pave the way for green urban logistics and mobility solutions.

1.1 Task 2 methodology and approach

The objective of task 2 is to contribute to the adoption of inland waterway transport beyond its traditional markets. It is aimed for the development of urban mobility and short-range IWT markets to exploit its potential for the sustainable management and development of inland ports. The identification of existing initiatives over Europe and the analysis of challenges and success factors aims for a promising fundament for the strengthening of urban mobility and short-range IWT in European inland ports. The experiences and lessons learned from good practice cases are a solid base for the estimation of the roll-out potential.

To deliver this objective the following sub-tasks were carried out:

Sub-tasks 2.1: Categorisation and evaluation criteria

Sub-tasks 2.2: Existing services and good practice cases

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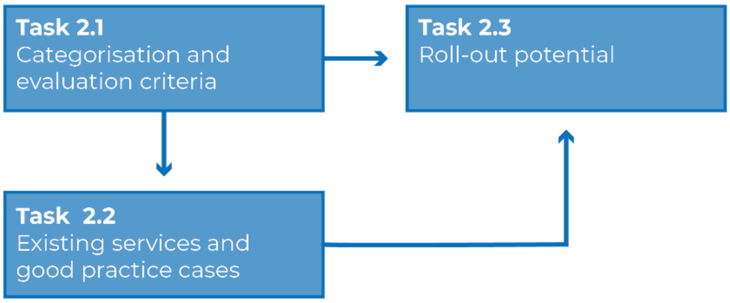
[1] See European Commission, Smart and Sustainable Mobility Strategy, Staff Working Document, 2020.
[2] See https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en.

Sub-tasks 2.3: Roll-out potential

Figure 1.2 represents the relationship between the sub-tasks of Task 2.

Figure 2.2 Overview of Task 2 activities



Source: Consortium

It was the idea to identify good practices in urban mobility and short-range IWT and learn from them to strengthen IWT in these markets. 20 good practices were identified to show smart concepts and business models as well as lessons learnt, which could be used to draw recommendations on how to develop feasible services and overcome existing barriers. Moreover, good practices showed how to support the set-up of new services by inland ports and other stakeholders. A careful selection of good practices was implemented to provide a solid base for the recommendations and pave the way for a roll-out of solutions beyond existing services.

Task 2.1 laid the foundation for the selection of good practices by providing the categorisation and the evaluation framework. The categorisation facilitated the analysis of services by market segment, considering their specifics. The joint analysis allowed for better identification of solutions to overcome existing barriers and untap potential. Moreover, the categorisation contributed to a balanced coverage of market segments and regions. A balanced coverage in the selection of the 20 good practice cases enabled a wide scope of recommendations.

Task 2.2 formed the core of the analysis. It provided an overview of existing urban mobility and short-range IWT services divided by category and delivered a detailed analysis of 20 good practice cases. Existing services and some key characteristics were gathered through literature research and a survey among inland port representatives and stakeholders. Good practice cases were selected based on a Quick-scan-analysis. These good practice cases were the subject of an in-depth analysis covering relevant service components. Evaluation criteria were applied to analyse case studies in a harmonised way, including interviews with involved stakeholders. A standardised evaluation framework was developed to present the good practice cases and the in-depth evaluation. Based on these evaluations, recommendations were drafted regarding the development of services.

Task 2.3 concludes the analysis by addressing the potential for urban and short-range IWT beyond existing services. Based on the evaluation of good practice cases, their roll-out potential was analysed. Moreover, the potential beyond the cases was roughly estimated.

1.2 Content of Deliverable 2.2

The first deliverable D2.1 focused on identifying success factors through an in-depth analysis of European good practice cases, which formed the basis of Subtasks 2.1 and 2.2. The final Subtask 2.3 aims to build upon these findings by quantitatively estimating the roll-out potential of urban and short-range IWT services. While initial results were introduced in the second intermediate report, this deliverable will present the full methodological framework and results of the quantitative estimation, thereby concluding Subtask 2.3.

Following the introduction, the Chapter 2 will outline the methodological framework for the quantitative estimation of the roll out potential. It outlines the four-step process used to estimate the roll-out potential, starting with the calculation of the potential regional service areas (Step 1) and progressing through the calculation of regional road transport volumes (Step 2), IWT volumes (Step 3), and growth scenarios (Step 4). This comprehensive framework forms the basis for assessing the potential transition of transport volumes from road transport to urban and short-range IWT.

Chapter 3 presents the results of the quantitative estimation, offering insights into the roll-out potential for IWT services across various regions. This overview allows the results to be categorised and interpreted.

02

Methodological framework for the quantitative estimation

2.0 Methodological framework for the quantitative estimation

Outlining the steps needed to calculate the roll out potential of urban and short-range IWT

Building on the results and insights from the analysis of good practice cases and exchanges with stakeholders, the first deliverable provides a solid base for the quantitative estimation of the roll-out potential for urban and short-range freight IWT. These insights allowed for the formulation of assumptions, creating a robust framework for further calculations. The calculations are limited to EU member states and refer to the potential for urban and short-range IWT in TEN-T ports and along TEN-T waterways only. The TEN-T transport network provides a harmonised pan-European database for ports and waterway networks.

The potential for urban freight transport is derived based on the population around TEN-T inland ports. For short-range freight transport regional GDP respectively employment by sector is a key determinant for the potential. As a result, a basic idea about the total potential for urban and short-range IWT is presented. This approach includes a methodological framework with four separate steps. A graphical overview of this methodological framework is shown in Figure 2.1. The stepwise calculation of the four intermediate steps allows creates transparency by presenting the individual assumptions of the intermediate steps and to derive the final results in a comprehensible way. In each step, assumptions are made regarding the selection of sectors, the geographical scope, the underlying parameters of growth scenarios and other relevant indicators. In this section, the individual steps are briefly explained, and the resulting estimates for the potential for urban and short-range IWT are presented in the following sections.

Related to the methodology urban IWT services are considered a subset of short-range IWT services, meaning their transport volumes are included in the short-range IWT potential. Consequently, the transport volumes for short-range IWT represent the upper limit of the roll-out potential.

For urban passenger IWT, which was examined in four different good practice cases (see D2.1), the analysis revealed that the roll-out potential is highly dependent on local conditions. Considering the availability and networks of alternative public transport modes, the potential for urban passenger IWT appears rather limited. Consequently, the roll-out potential for urban passenger services was deemed insufficient for quantitative estimations, and such calculations were not carried out in this study.

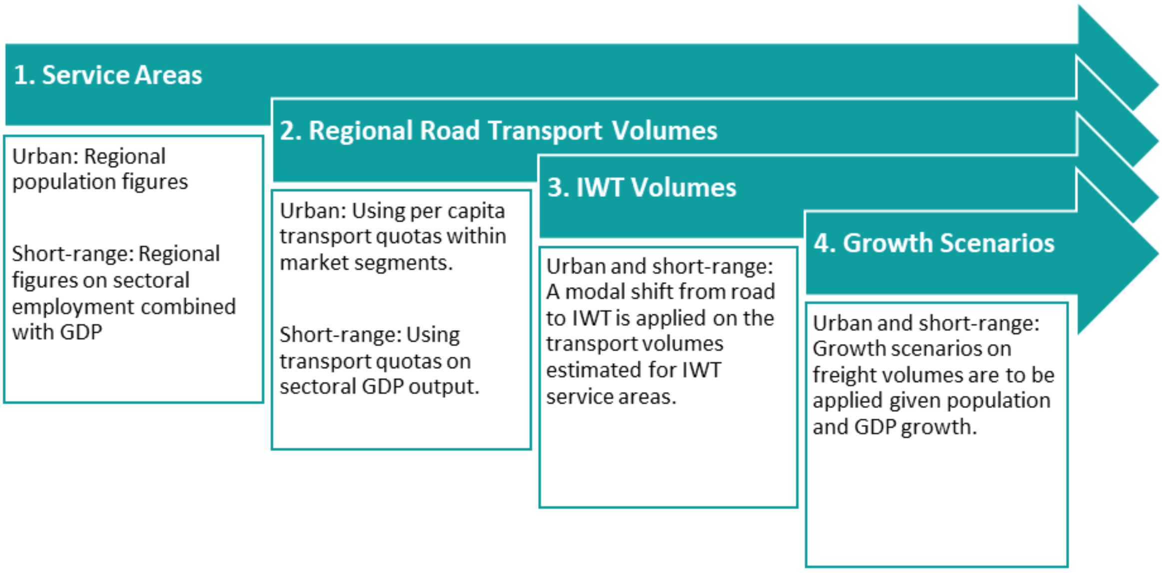


Figure 2.1 Methodological framework for the estimation of the roll-out potential

2.1 Step 1: Calculation of the potential service areas

The first step is the identification of the potential service areas. Important factors for this identification are the definition of a IWT service radius around a port as its catchment area, the range of last mile operation and a demarcation of urban and non-urban areas. Therefore, a distinction must be made between the potential for urban and short-range IWT services, as they differ in factors like range and last-mile operation. Further details on the differentiation of these factors are provided in Table 2.1. The IWT service radius shows the delimitation of the port catchment area for the two different operations. Assumptions regarding LMO delivery time and modes define a further spatial delimitation, as to how much of the hinterland can be covered by the IWT service. Population density is used to identify urban areas.

Both kinds of IWT services require a spatial delimitation to define the potential service areas, in which a potential modal shift to IWT can be assumed. This was achieved (semi-)automatically using a digitalised solution to process most of the calculation steps. The basis for the delimitation was the Ten-T waterway and inland port network. The use of data from the European TEN-T waterway network allows comparability and ensures that it is possible to shift freight transport to the waterways on which the model is based. Each inland port was considered individually. A perimeter was selected to delimit the service area around inland ports. The radius of 20 km was selected for urban cases. This limit correlates with good practice cases in which deliveries on the waterway were also made within a maximum radius of 20 km. A radius of 50 km was selected for short range cases, following the definition of short-range transport applied in this study.

Within this selected radius, waterway sections were cut out and broken down into waterway points. Each waterway point was considered individually as a potential last mile transhipment point, to take into account the accessibility by waterways as a necessary asset. At each waterway point a delivery area of the last mile operation was drawn according to a certain delivery time using an

OpenStreetMap-based routing algorithm. [3] For short range applications, a delivery time of half an hour with a motorised vehicle was assumed. For urban applications, a delivery time of 10 minutes by bicycle or motorised vehicle was assumed. This assumption of 10 minutes is also in line with good practice cases such as in Strasbourg, where even the delivery time is limited to 8 minutes. Other stakeholders aim for more optimistic delivery times. Delivery areas at the respective waterway points were analysed in terms of their population density to differentiate between urban and non-urban areas. A threshold of 700 inhabitants per square kilometre was selected. This corresponds to the average of three sources using criteria of the OECD[4], Eurostat[5] and the UN[6] on this topic. An overview of the various assumptions in the spatial delimitation of the IWT service areas is shown in Table 2.1.

Table 2.1 Assumptions for the spatial delineation of potential IWT service areas

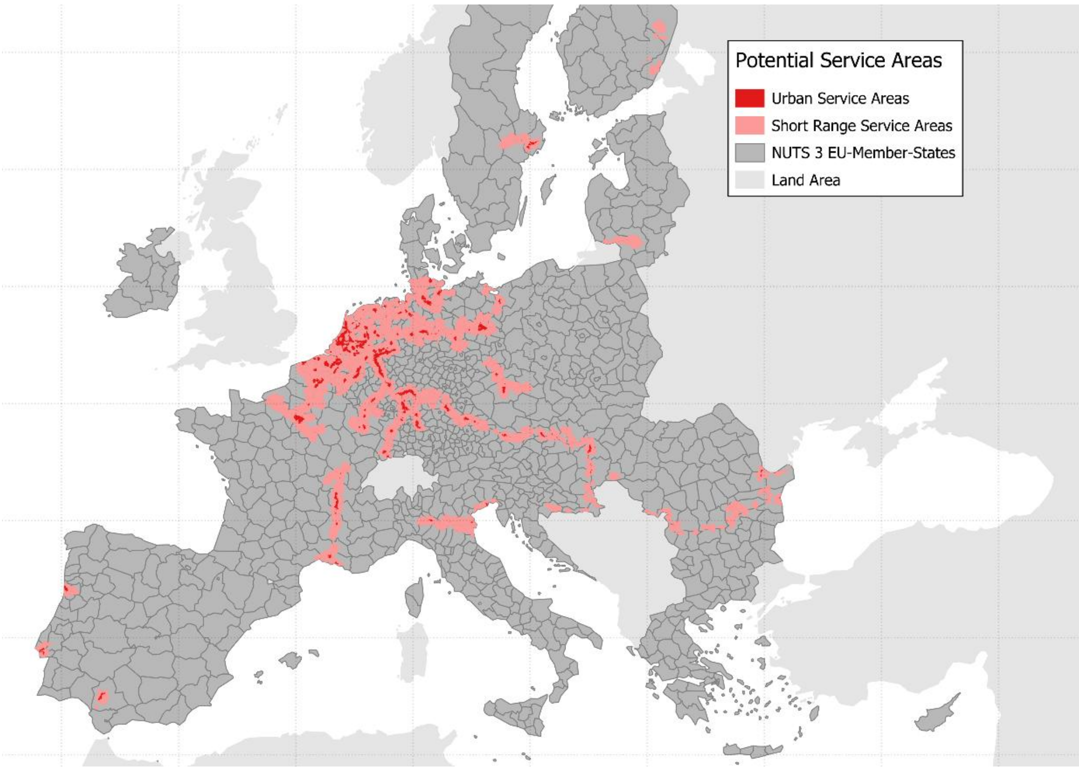
Assumptions	Urban IWT services	Short range IWT services
IWT service radius	20 km	50 km
LMO delivery time	10 minutes	30 minutes
LMO delivery modes	Motorized vehicles, bikes	Motorized vehicles
Population density p. square-km	>700	>0

Using the underlying assumptions, waterway points within a defined radius around Ten-T ports were identified, and last-mile operation zones were created for each point. These zones were then aggregated across Europe, resulting in the delineation of potential service areas. The results for the spatial extension of potential urban and short-range supply areas can be seen in Figure 2.2.

The map highlights numerous waterways where Ten-T inland ports are located. These include major waterways such as the Danube, Rhine, Seine, and Rhone, as well as the dense canal network of the Benelux countries. However, European inland ports which are not part of the TEN-T network are missing from the map as this analysis focus on the potential around TEN-T inland ports. Nonetheless, limiting the selection to Ten-T ports ensures a consistent and reliable identification of potential locations that could serve as distribution centres for urban and short-range logistics.

[3] Giraud, T., (2022). osrm: Interface Between R and the OpenStreetMap-Based Routing Service OSRM. Journal of Open Source Software, 7(78), 4574, https://doi.org/10.21105/joss.04574
[4] Source: https://www.oecd.org/en/data/datasets/oecd-definition-of-cities-and-functional-urban-areas.html, last access: 14.8.2024
[5] Source: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Archive:Urban-rural_typology, last access: 14.8.2024
[6] Source: https://unhabitat.org/sites/default/files/2020/06/city_definition_what_is_a_city.pdf, last access: 14.8.2024

Figure 2.2 Potential service area map on urban and short range IWT



Both the urban IWT service area and the short-range service area were divided into European NUTS3 regions in the next step. Regional Eurostat data could be used to provide the area-based proportional input data for the first step within the methodological framework. In urban areas, the calculation is based on population data[7] anticipating a diverse distribution of residential zones. As the spatial division is more fragmented here, with small service areas, the location of zones with residential land use from OpenStreetMap was taken into account in the population density extrapolation. This helped to better identify urban areas in more detail for the application of urban IWT services. In the short range IWT transport sector, GDP per person employed was calculated for each region using data on regional sectoral employment[8] and the regional GDP.[9] Sectoral employment data for NUTS3 regions were applied to the share of the NUTS3 area covered by the service area for the industrial, agricultural and manufacturing sectors. This makes it possible to determine regional sectoral outputs, which correlates with the transport of certain groups of goods.

At this point, it should be noted that there is a geographical overlap between the two service areas, in which urban service areas represent a subset of the short-range service areas. This is to be anticipated when delimiting subsets for the calculation of the roll-out potential. For urban IWT cases the number of inhabitants that could be covered by potential service areas is estimated at 38.3

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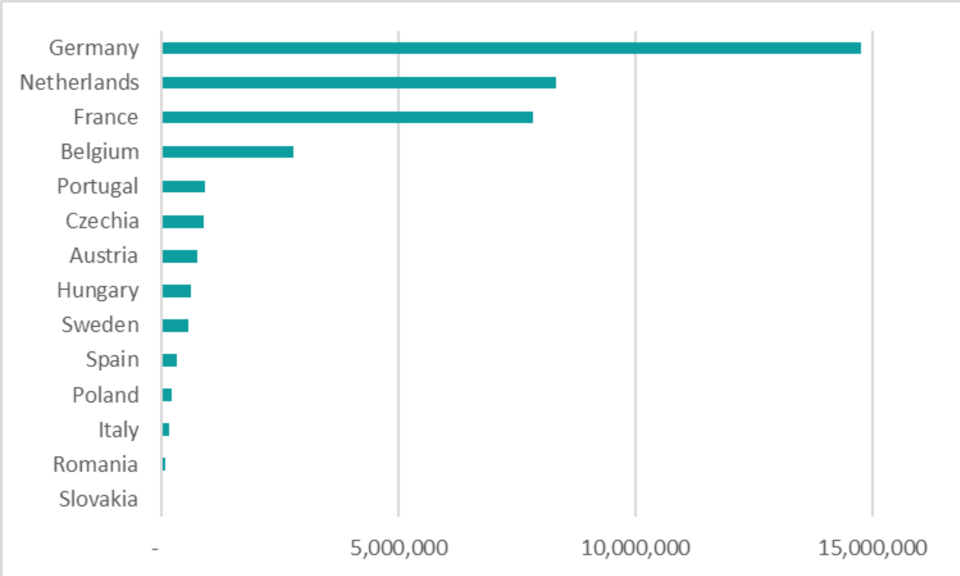
[7] Source: https://ec.europa.eu/eurostat/databrowser/view/demo_r_d3dens$defaultview/default/table, last access 14.8.24

[8] Source: https://ec.europa.eu/eurostat/databrowser/view/nama_10r_3empers__custom_12383206/default/table, last access 14.8.24

[9] Source: https://ec.europa.eu/eurostat/databrowser/view/nama_10r_3gdp/default/table, last access 14.8.24

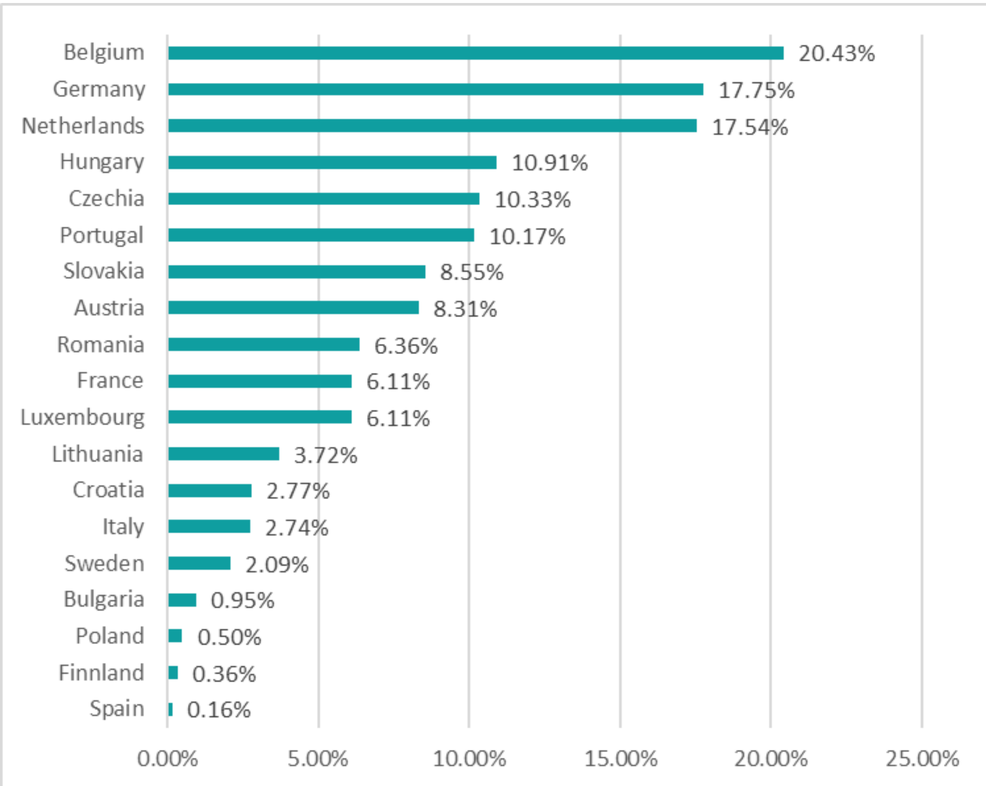
million in EU27 for 2021. Germany accounts for 38.47 %, the Netherlands for 21.7 % and France for 20.48 %. The population in the identified service areas by country is shown in Figure 2.3.

Figure 2.3 Population in potential urban service areas for urban IWT



For potential short-range IWT cases, the share of potential service areas in regional sectoral GDP per NUTS 3 region was calculated. In total, this results in an output of € 1.2 billion in EU27 for 2021, representing 8.5% of the economic output of the EU member states. Figure 2.4 shows the share of economic output in the respective countries.

Figure 2.4 Share of national GDP in potential short-range service areas



2.2 Step 2: Calculation of regional road transport volumes

The regional input data for urban IWT services must be multiplied by transport rates based on Eurostat data. The data basis for urban cases is divided into the market segments waste, construction, retail and parcels. National statistics on short-distance transport (<50 km) by road by freight group[10] were used to calculate per capita transport volume quotas for the sectors of retail and parcel transport. Different freight groups were selected to those market segments. For parcel deliveries the freight group of "mails and parcels" in short-distance (<50 km) road transport was selected. For retail deliveries the freight groups of "food products, beverages and tobacco", "furniture; other manufactured goods" and "textiles and textile products; leather and leather products" in short-distance (<50 km) road transport where selected. These quantities were divided by the population to obtain the per capita quotas per country. Transport volumes for waste are derived from the municipal waste management operations.[11] The volume of transport for construction sites was estimated from the statistics on building permits in millions of square kilometers.[12] With a quota of 350 kg per square metre of building material transports, a possible volume of transport quantities was estimated. This rate is derived from a feasibility study for the extension of the Construction Consolidation Centre (CCC) in the north (Vergotedok) and south of Brussels (Biestebroekdok), which thus provides a reference to the good practice case for waterborne supply of urban construction sites in Brussels.[13] The average per capita transport rates for the EU member states are 532 kg p.a. for waste transport, 317 kg p.a. for construction material deliveries, 112.8 kg p.a. for parcel deliveries and 1,060 kg for retail deliveries. These values vary from country to country.

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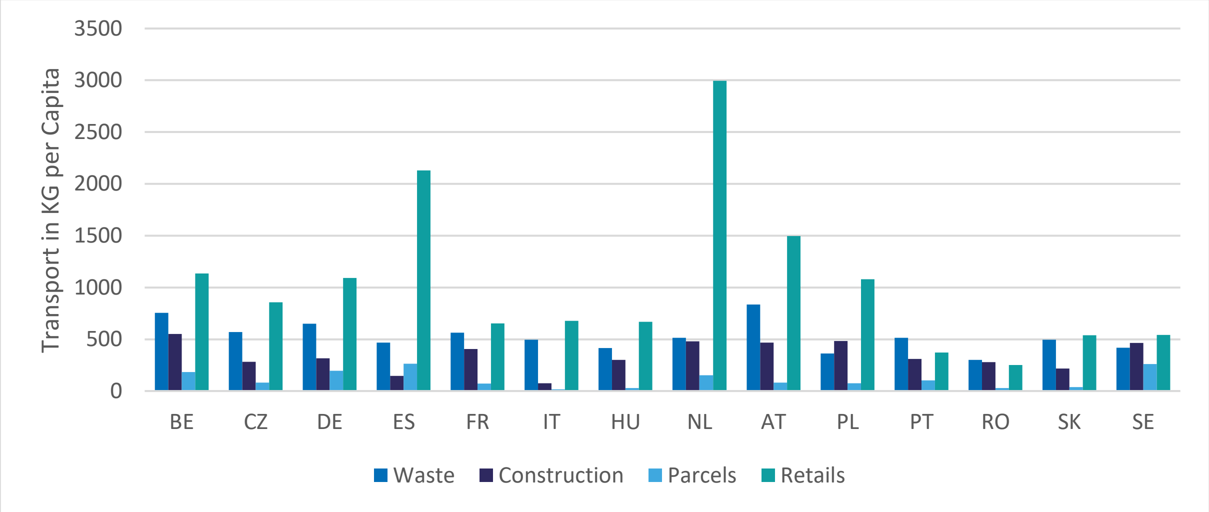
[10] Source: https://ec.europa.eu/eurostat/databrowser/view/road_go_ta_dctg__custom_12386016/default/table, last access 14.8.24

[11] Source: https://ec.europa.eu/eurostat/databrowser/view/env_wasmun$defaultview/default/table, last access 15.8.24

[12] Source: https://ec.europa.eu/eurostat/databrowser/view/sts_cobp_a$defaultview/default/table, last access 15.8.24

[13] Source: Haalbaarheidsstudie voor de uitbreiding van het Construction Consolidation Center (CCC) in het noorden (Vergotedok) naar het zuiden van Brussel (Biestebroekdok) - Eindrapport, Port Brussels

Figure 2.5 Urban inland waterway per capita transport quotas



For the calculation of transport quotas in the short range IWT sector, the basis is limited to data on national road transport in the short range (<50 km) by freight group.[14] The product groups were aggregated into the industrial sector, the agricultural sector and the manufacturing sector. This aggregation allowed transport volumes to be divided by sectoral output after splitting the national GDP[15] into the aggregated sectoral employment data. Since GDP data was only available at the national level and not at the local NUTS3 level, this step was necessary to derive local economic outputs. By combining economic output and employment data, it became possible to exclude economic output values that primarily result from services, which do not correlate with transport volumes.. Correlating freight groups with sectors are shown in the Table 2.2.

[14] Source: https://ec.europa.eu/eurostat/databrowser/view/road_go_ta_dctg__custom_12386016/default/table, last access 14.8.24

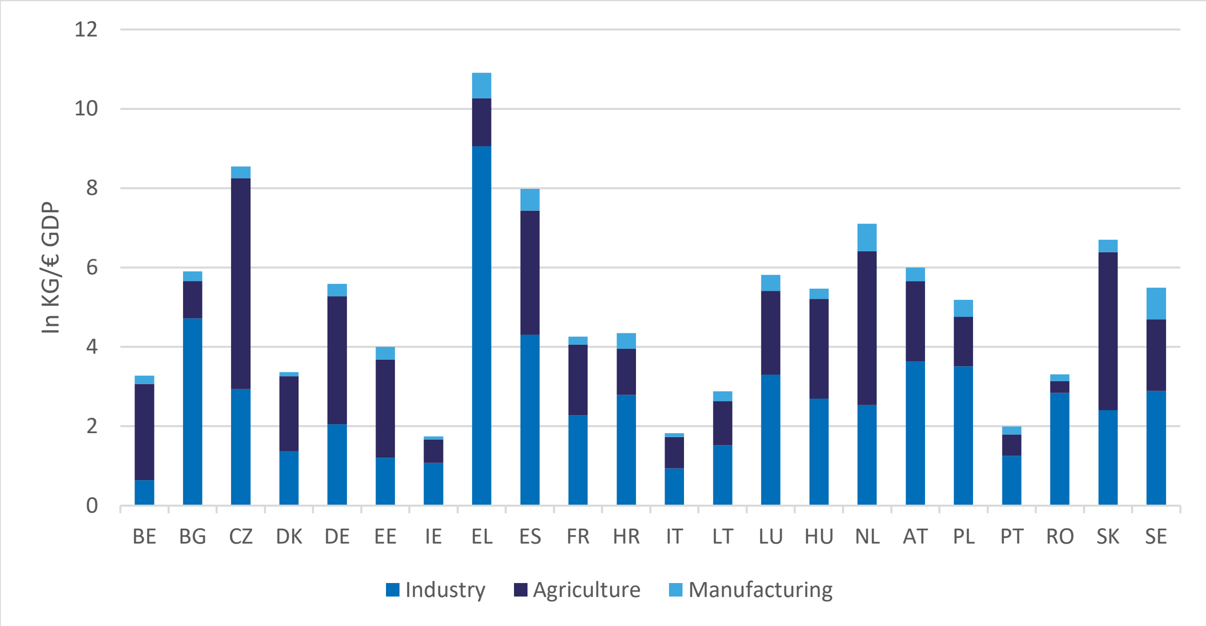
[15] Source: https://ec.europa.eu/eurostat/databrowser/view/tec00001/default/table, last access 14.8.24

Table 2.2 Freight groups allocation by economic sector

Sectors	Freight group selection
Industrial sector	• Coal and lignite; crude petroleum and natural gas • Metal ores and other mining and quarrying products; peat; uranium and thorium • Coke and refined petroleum products • Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel • Other non-metallic mineral products • Basic metals; fabricated metal products, except machinery and equipment • Secondary raw materials; municipal wastes and other wastes • Grouped goods: a mixture of types of goods which are transported together • Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16. • Other goods n.e.c.
Agricultural sector	• Products of agriculture, hunting, and forestry; fish and other fishing products • Food products, beverages and tobacco
Manufacturing sector	• Textiles and textile products; leather and leather products • Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks • Transport equipment • Furniture; other manufactured goods n.e.c. • Equipment and material utilized in the transport of goods • Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.

After this allocation of product groups, the output per sector per country can be estimated by aggregating the regional sectoral employment data and the GDP per employee. Dividing the aggregated transport data by the sectoral output yields transport ratios of kg per € of economic output, which can later be reapplied to the regional figures to obtain regional transport volumes in proportion to area. Results of this calculation are shown in Figure 2.6. The average transport rates in kg transported per euro produced are 2.13 kg in the agricultural sector, 2.99 kg in the industrial sector and 0.38 kg in the manufacturing sector. These values vary between countries.

Figure 2.6 Short-range IWT quotas



Potential service areas for urban and short-range IWT overlap geographically (see above) and for the estimation of the regional road transport volumes with potential for modal shift the same dataset for national statistics on short-distance road transport (<50 km) by freight group was used. Therefore, it is reasonable to assume that urban IWT freight volumes are a subset of short-range IWT freight volumes. The relationship between urban and short-range IWT freight volumes will be clearly outlined in the next chapter.

The combination of transport quotas with regional input data result in a total road transport volume within the identified service areas of 1.66 billion tonnes in 2021 (12.2 % of total road freight transport in EU27). Out of this road transport volume, 96.9 million tonnes in 2021 (0.6 % of total road freight transport in EU27) apply to the urban service areas.

2.3 Step 3: Calculation of IWT volumes

As so far IWT accounts for only a small volume of urban logistics, it is assumed that the total estimated transport volume within the scope of potential urban service areas is currently handled by road transport. The volume is a subset of the estimated short-range transport volumes which are based on road transport statistics. A modal shift is possible within these urban and short-range road transport volumes if IWT services are developed within potential service areas applying success factors identified in the good practice case analysis. The modal shift refers to the percentage of regional road transport volumes that could be handled by urban and short-range IWT. However, determining the modal shift depends on several parameters that are difficult to determine. As an alternative, it is assumed in the status quo scenario that the modal shift potential of urban and short-range road transport corresponds with the overall market share of IWT compared with road transport, i.e. the share of IWT volumes (tonnes) of the total transport volume of IWT and road transport for EU27 in 2021.

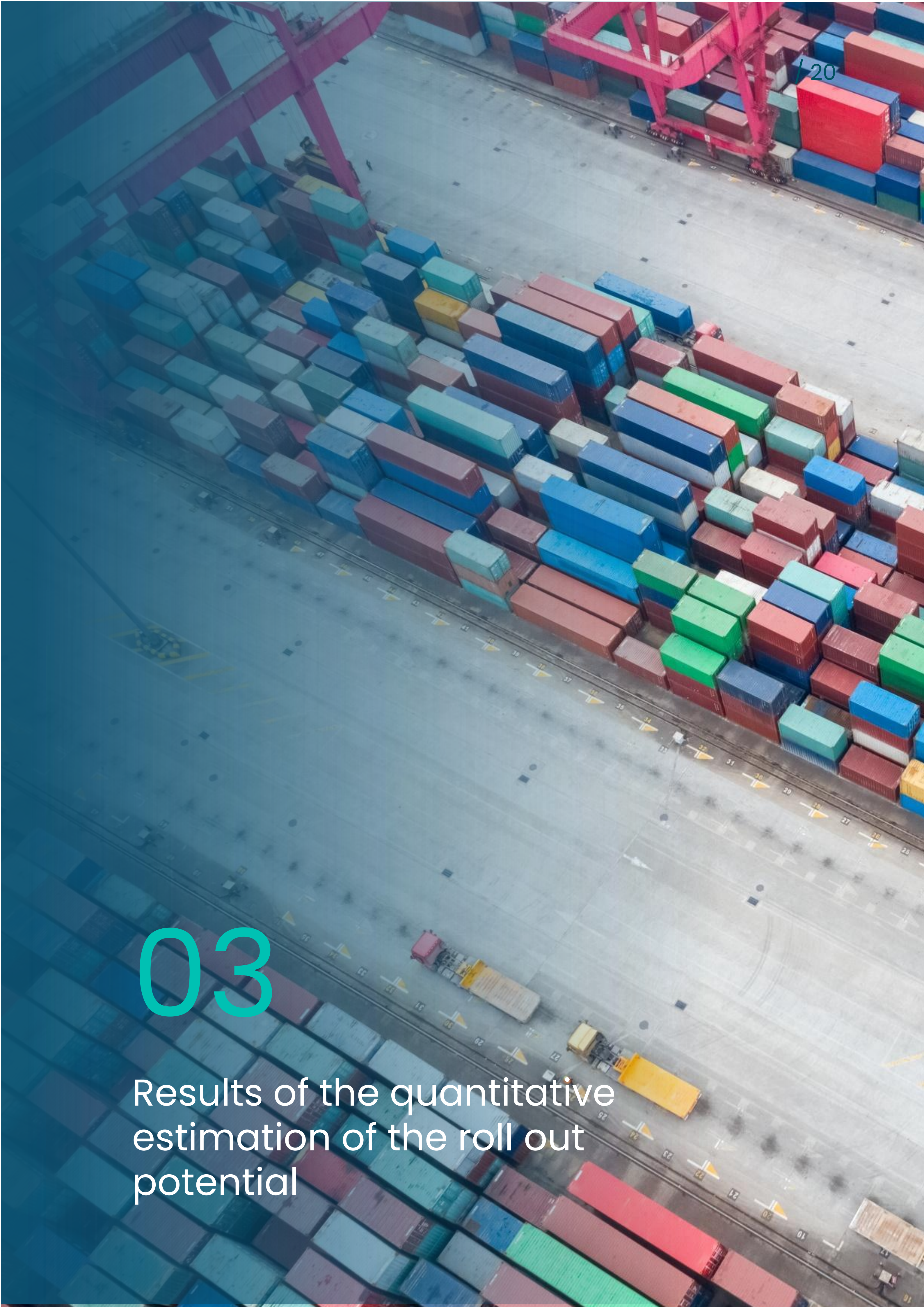
According to Eurostat data IWT volumes in tonnes account for 3.6% of the total transport volume of IWT[16] and road transport[17] for EU27 in 2021. If this modal shift of 3.6 % is applied to urban and short-range road freight transport, the potential roll-out transport volumes in EU27 amount to 3.5 million tonnes for urban IWT services and 60.4 million tonnes for short-range services in 2021.

2.4 Step 4: Calculation of growth scenarios

The growth of regional road transport volumes needs to be considered. Growth expectations are based on population projections for the NUTS3 regions for the calculation of urban transport volumes. For short-range transport, growth is based on projections of the GDP per capita. A GDP growth of 1.5 % p.a. is assumed. The demographic changes in the 20-64 age group were considered to reflect the changes in the workforce.

In addition to the transport growth, in an optimistic scenario with a 50% larger modal shift to IWT compared to the status quo scenario is applied assuming better framework conditions for urban and short-range IWT.

[16] Source: https://ec.europa.eu/eurostat/databrowser/view/ttr00007/default/table?lang=en&category=t_iww, last access 17.1.25
[17] Source: https://ec.europa.eu/eurostat/databrowser/view/ttr00005/default/table?lang=en&category=t_road, last access 17.1.25



03

Results of the quantitative estimation of the roll out potential

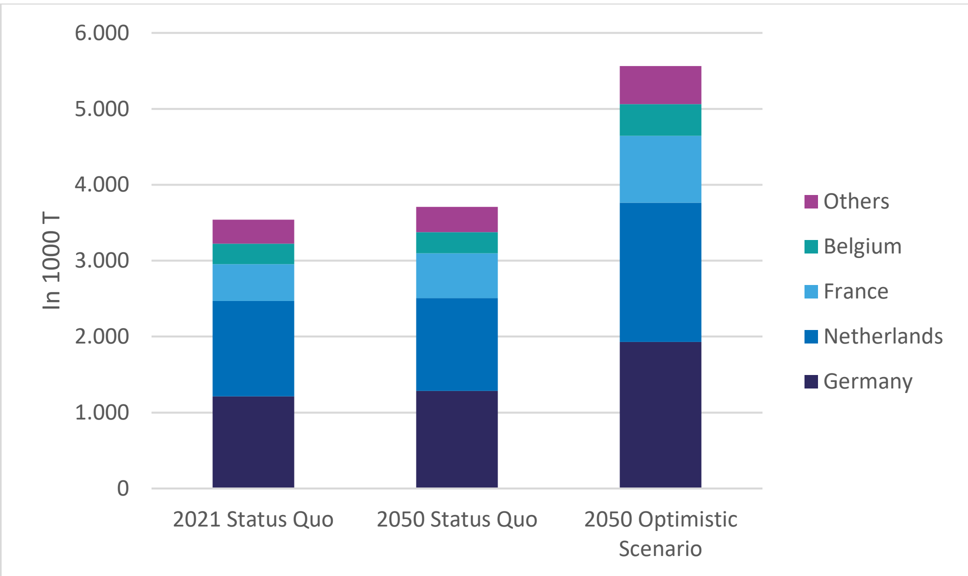
3.0 Results of the quantitative estimation of the roll out potential

Showing transport volumes that could be shifted towards sustainable IWT

Applying the methodological framework the roll-out potential of urban and short-range IWT is estimated based on intermediate results for each step within the methodological framework. A status quo and an optimistic scenario with a larger modal shift to IWT are distinguished. The result is the roll-out potential in urban (Figure 3.7) and short-range IWT (Figure 3.8) whereby the urban potential is a subset of the short range potential. The estimations on the roll-out potential for urban and short-range IWT services in Europe illustrate considerable opportunities for a shift from road transport to waterways.

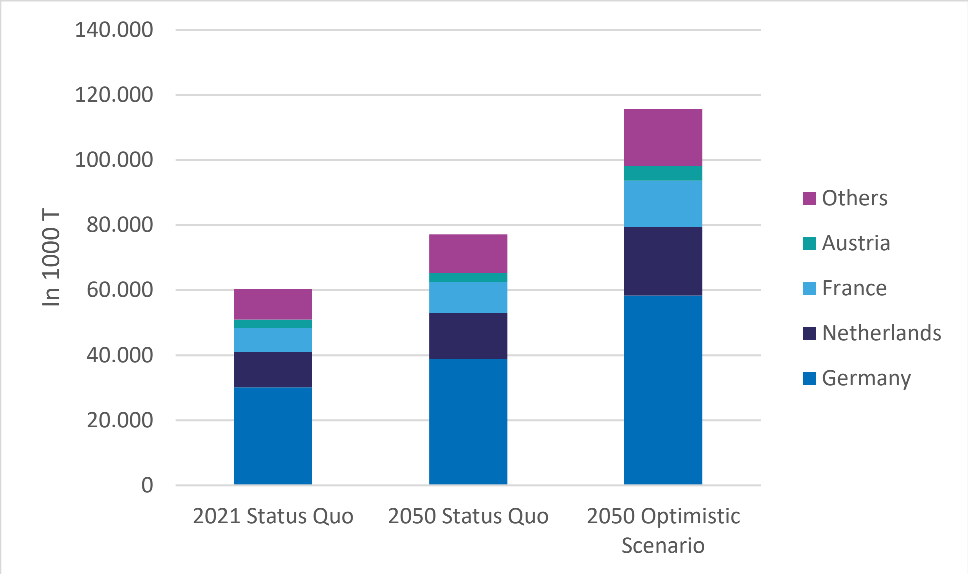
The roll-out potential in the urban IWT sector reflects the specific challenges and limitations of integrating inland waterway transport into urban logistic chains. Germany shows the largest potential of 1.3 million tonnes in the status quo scenario and 1.9 million tonnes in the optimistic scenario by 2050. The potential is related to the river Rhine and its nearby urban centres, and other regions such as Berlin, where developments have already started as demonstrated in the good practice case analysis. The Netherlands and Belgium, with their dense network of waterways, also show potential in this area, as does France, where public stakeholders such as VNF or HAROPA have shown a willingness to promote good practice cases within this sector. Overall, the modal shift potential is estimated for EU27 with 3.7 million tonnes in the status quo scenario and 5.6 million tonnes in the optimistic scenario by 2050.

Figure 3.7 The quantitative roll-out potential of urban IWT



Germany also shows the largest potential in the short-range sector of 38.9 million tonnes in the status quo scenario and 58.3 million tonnes in the optimistic scenario by 2050. Other countries such as the Netherlands, France and Austria also show considerable potential, too. Overall, the modal shift potential is estimated for EU27 with 77.1 million tonnes in the status quo scenario and 115.7 million tonnes in the optimistic scenario by 2050.

Figure 3.8 The quantitative roll-out potential of short-range IWT



The calculation of urban and short-range IWT shares the same basis, using figures of European road transport volumes (<50 km), broken down by country and freight group. Additionally, all potential urban service areas are geographically sub-areas of the potential short-range service areas. Therefore, the transport volume for urban IWT can be considered a subset of the short-range IWT potential. This means that the transport volume for short-range IWT represents the upper limit of the European roll-out-potential. Figure 3.9 illustrates this relationship.

Figure 3.9 Relationship between urban and short-range IWT volumes

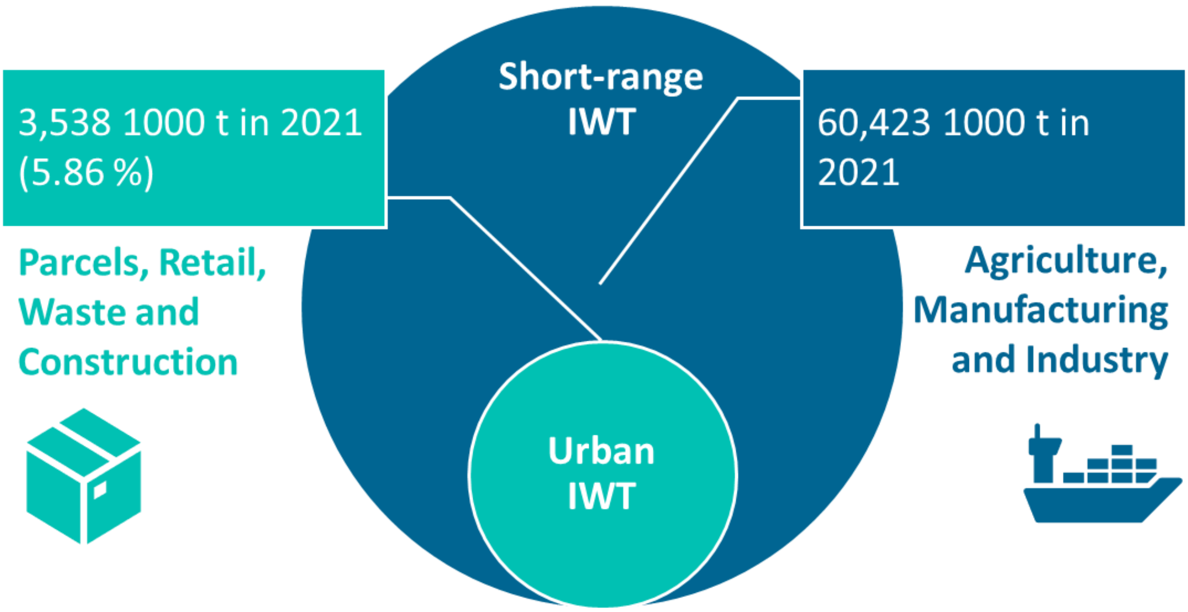


Table 3.3 The total quantitative roll-out potential of urban and short-range IWT

	2021 Status Quo	2050 Status Quo	2050 Optimistic Scenario
Urban Roll-out-potential in 1000 T	3,538.21	3,709.90	5,564.84
Short-range Roll-out-potential in 1000 T	60,423.14	77,138.78	115,708.17

With a total IWT volume of 513 Mio t in EU27-states in 2021[18], the quantitative roll-out potential accounts for 11.8 % of existing IWT freight volumes. Overall, the estimations show a strong potential for shifting urban and short-range logistics to inland waterways, especially in countries with well-developed waterway networks. For untapping the potential for a modal shift to IWT challenges for urban and short-range operation need to be overcome. By analysing good practice cases, this study showed various ways of creating feasible IWT services to meet these challenges. To fully realise the identified roll-out potential, it will be necessary to consider the success factors for the implementation of urban and short-range IWT services.

Key to the successful development of IWT services is the cooperation of both public and business stakeholders and the implementation of urban vehicle access regulations. Considering the challenging feasibility public support and funding may be required in the initial phase to set up IWT services. The potential shows that further development of the sector is justified and will create social benefits by mitigating road transport and related external effects.

[18] Source: https://ec.europa.eu/eurostat/databrowser/view/ttr00007/default/table?lang=en&category=t_iww, last access 17.1.25

04

Summary

4.0 Summary

Conclusions on the roll-out potential for urban mobility and short-range inland waterway transport

This investigation, conducted as part of the "Green Inland Ports" study on behalf of the European Commission, explores the potential of urban and short-range inland waterway transport (IWT) services to shift road transport to more sustainable waterway alternatives. The investigation focused on freight transport within urban and short-range contexts as well as passenger transport in an urban context, assessing the feasibility of integrating IWT into logistics chains for market segments such as containers, parcels, waste, construction, retail, and mixed-use cases. The study was structured into three parts: first, the identification of good practice examples across Europe; second, an in-depth analysis of selected cases to identify key success factors; and third, the quantification of roll-out potential for similar services across the continent. With the completion of the third phase, a comprehensive overview of the findings is now available.

The first subtask identified 20 exemplary cases of urban and short-range IWT, highlighting innovative and successful solutions in freight and passenger transport. These examples demonstrated how IWT can address challenges such as urban congestion, emissions, and the growing need for sustainable logistics solutions. From short-distance container transport to small-scale urban deliveries via waterways, the cases showcased a wide range of freight IWT applications. Passenger transport was also represented, with examples of ferry systems integrated into public transport networks. Together, these cases formed the foundation for further analysis of critical success factors in the second phase.

In the second subtask, a detailed analysis of the good practice examples revealed key enablers for the successful implementation of urban and short-range IWT services. Discussions with stakeholders, including operators, public authorities, and logistics providers, identified urban vehicle access regulations (UVARs) such as environmental zones as a crucial factor for shifting transport from road to waterways. These regulations not only restrict truck access in densely populated areas but also enhance the competitiveness of IWT. Other success factors included strong collaboration between public and private stakeholders, the development of transshipment facilities, and the use of innovative solutions such as zero-emission technologies, mobile hubs, and cranes to address infrastructure constraints. Despite these successes, challenges such as high operating costs, regulatory hurdles, and limited access to waterway infrastructure remain significant barriers to widespread adoption. Therefore, the adoption of success factors is crucial to enable the shift of transport towards a more sustainable IWT concept.

The third subtask of this investigation presented in this deliverable provided a quantitative estimation of the roll-out potential for urban and short-range freight IWT services across Europe.[19] Using a methodological framework based on current and projected road freight transport volumes, the study calculated potential modal shifts under both status quo and optimistic scenarios. The results showed substantial potential for short-range IWT, with an estimated 77.1 million tonnes of transport volume in the status quo scenario and 115.7 million tonnes in the optimistic scenario by

[19] For urban passenger IWT, the great importance of local factors for the roll-out potential did not allow a general calculation of the roll-out potential on European level.

2050. Urban IWT potential represents a significant opportunity, with 3.7 million tonnes in the status quo scenario and 5.6 million tonnes in the optimistic scenario by 2050. Countries with well-developed waterway networks, such as Germany, the Netherlands, Belgium, and France, emerged as key regions for this potential.

Overall, the findings of this study highlight the strong potential for urban and short-range IWT to contribute to a modal shift from road to waterways. While challenges persist, the good practice examples and quantitative results demonstrate that the sector's further development is both feasible and justified. Urban and short-range IWT can play a crucial role in mitigating the negative externalities of road transport, including emissions, congestion, and noise pollution. However, achieving this potential will require continued public support, targeted funding, and close collaboration between stakeholders. By addressing infrastructure limitations and creating supportive regulatory frameworks, IWT can serve as a cornerstone of sustainable urban and regional logistics, fostering environmental, social, and economic benefits across Europe.