

## D.T1.5.5 - ACTION PLANS TO IMPROVE MULTIMODAL NODES EFFICIENCY AND CONNECTIONS - RIJEKA (NAPA)

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Last mile connections

Node management optimization

New multimodal services

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## Executive summary

For the past few years, Rijeka Port Authority as a responsible institution for the development and promotion of the Rijeka’s traffic route, has been implementing numerous consultations with key stakeholders and experts in the field of multimodal transport. Various activities have been carried out with an aim of collecting bottlenecks and finding solutions to them, such as workshops, individual meetings, and conduction of surveys and desk researches. Bottlenecks refer to the technological, infrastructural, organizational, administrative, and legal levels of functioning of traffic services through the routes across the Port of Rijeka. The result is a list of activities that are necessary to be implemented in order to enable the optimization of the service, increase its competitiveness, and, consequently, stimulate social and economic growth.

This document is dedicated to the development and improvement of Multimodality, one of the two fields of action of the TalkNET project, along with Eco-innovation. Respectively, specific sub-topics are developed through the project activities of both fields, as shown in the table below:

<b>1</b>	<b>LAST MILE CONNECTIONS OF MULTIMODAL NODES</b>	<b>MULTIMODALITY</b>
<b>2</b>	<b>NODE MANAGEMENT OPTIMIZATION</b>	
<b>3</b>	<b>ASSESSMENT OF MULTIMODAL SERVICES</b>	

<b>4</b>	<b>ALTERNATIVE FUELS DEPLOYMENT</b>	<b>ECO-INNOVATION</b>
<b>5</b>	<b>ENERGY EFFICIENCY SOLUTIONS</b>	

In particular, it will present the *“Action Plan to improve multimodal nodes efficiency and connections - Rijeka (NAPA)”* that will focus on the development of IT tool for optimization of wagon loading.

Starting point to present the actions that are planned is *the “Analysis on multimodal nodes efficiency and connections - Rijeka (NAPA)”* developed within the project, that reports the main challenges that Port of Rijeka has to face in order to improve its efficiency, that is related mainly to the upgrading of the port administration and logistics. In fact, the actions that will be presented in details in this document are the answers to the problems, needs and challenges identified within the first step of the project activities, that is to say the analysis phase of the TalkNET nodes’ regions.

In general, the analysis has foreseen the assessment of the multimodal chain in which ports and logistics nodes operate, to understand how is the state of art (AS-IS analysis) and what are the methods to improve the situation (TO-BE) that will be performed in the following stages of TalkNET implementation. The tool chosen to achieve these aims is the S.W.O.T. analysis.

The actions planned are presented per cluster. TalkNET has set-up five thematic clusters -corresponding to the five sub-topics shown in the table above - right on the basis of the common priorities identified through the analyses of all

project partners, identifying the cooperation networks with mapped stakeholders in order to improve their coordination.

At the same time, the actions presented will support and will be the ground for the implementation of the pilot action that will be carried out within the project.

Therefore, the core intervention logic of the project is the following:

- 1) to detect the problems affecting the nodes (*analysis phase*)
- 2) to find solutions through specific actions planned (*planning phase*)
- 3) to test and implement the solutions presented (*testing phase*)

Finally, the document will offer also a brief overview of the best practices that can offer good solutions to better plan action and the pilot action foreseen in the project (the complete collection of best practices is available in the knowledge management activity of the project: Outputs Knowledge tools).

In the following paragraphs, a summary of each action included in this document will be presented, clearly linking *problems/needs/challenges* and *actions/solutions* that will be illustrated through the support of the results of the SWOT analysis.

SWOT ANALYSIS OF THE PORT OF RIJEKA - RESULTS:

STRENGTHS	WEAKNESSES
<p>Favorable geographic position in the TEN-T transport network (Mediterranean and potentially inclusion on the Baltic Adriatic)</p> <p>Existing capacities (port, back, rail, road, air) used below 50%</p> <p>The presence of the largest liner container operators, leading world freight forwarders and new rail operators</p> <p>Development potential of the Zagrebačka obala (Zagreb coast), the port of Bakar basin, LNG terminals, logistic terminals of Škrljevo and Miklavlja, direction towards Slovenia and Hungary</p> <p>Maritime and other faculties are a strong base of quality personnel that would carry the growth and development of the port with a strong maritime tradition</p>	<p>Inadequate maintenance of sea depth and coastal infrastructure aligned with ship size growth, especially in the part of conventional port</p> <p>Inadequate rail capacity in port with limited lengths of the composition (350 vs. 550/750 m), weight and speed limitations of the rail</p> <p>Lack of crane for efficient ship manipulation</p> <p>Lack of regular rail services to the markets of Central Europe and non exploitation of opportunities, eg. first clearance of goods (Procedure 42)</p> <p>Lack of a coordinated and systematic approach to capacity sales on target gravitational and overseas markets, and clear goals and responsibilities</p> <p>Disintegration, partial and short-term approach to the growth and development of the port and the traffic</p>

<p>Multipurpose port</p> <p>Increase of a certain type of traffic (livestock)</p> <p>Emphasis on the development of container traffic</p> <p>Large gravitational land area</p> <p>The developmental potential of transshipment (both for bulk cargo and containers)</p>	<p>direction, and lack of coordination of port-related services</p> <p>Lack of representations in gravitational areas</p> <p>Just few entities with AEO status</p> <p>The existence of three customs zones and the need for customs procedures for traffic between them, thus expending the costs to the end use</p> <p>Bypassing a lot of of line-by-line services that are not in the port of Rijeka and at the same time concern the competing ports of Trieste and Koper</p> <p>The port of Rijeka is not included in the Baltic - Adriatic corridor</p>
<p><b>OPPORTUNITIES</b></p>	<p><b>THREATS</b></p>
<p>Growth of overseas markets, in particular BRICS, as well as receptive markets in the gravitational area of the port</p>	<p>Bypassing traffic routes (eg. Western Romania via Budapest, etc.) and the creation of new traffic routes (eg. Piraeus-Belgrade-Budapest-Slovakia)</p>

The nearest competitors (ports) are close to the maximal utilization of port and rail capacities

The development of car transshipment (Kopar is 3<sup>rd</sup> in Europe) as well as the shuttle service of Trieste with Turkey for trucks and containers provided the upgrading of the existing railway infrastructure in the hinterland

The transformation of the old 19<sup>th</sup>-century city port into a nautical port because of its optimal characteristics (built for ships up to 100 meters and a built-in breakwater) and the development of cruising

New technologies in the processing of *cooking* and LNG terminals create new opportunities (coke, frigo terminal, competitive PVC products, airport development in the function of cargo traffic)

A favorable climate for drying natural wood in natural conditions

Liberalization of rail services and appearance of new operators

The dominance of containerization in the development of traffic in the world

Croatia is not yet in Schengen

A large number of competing ports for the same gravitational area

Kopar and Trieste have better infra and superstructure, are better connected with the hinterland, and are the first ports in the rotation of line services, and thus predominated for transit traffic towards Central Europe

Rijeka is traffic-dependent on Slovenia and Hungary with which there are no harmonized traffic strategies and priorities

Resistance of the local community to the development of port activities (eg. Bakar and Omišalj)

Potential disadvantage of highly qualified workforce

Global crisis - the consequences are reducing all types of traffic



After a detailed analysis of the functioning of the Rijeka traffic route, several key actions for its progress have been identified. Actions are shown and described in the document relating to the improvement of the railway infrastructure in the port, optimization of railway operations, improvement of the railway connection of the port and the background market, improvement of administrative and organizational processes of work in the port and improvement of marketing activities.

Most of this action will not be followed by a pilot action within the TalkNET project, but presents priority steps to improve port operations in future invasions.

Anyway, performed analysis is the ground for one pilot action that will be carried out within the project. The pilot action will create tailor-made software that will independently calculate the loading plan based on cargo and wagon data. This will speed up the loading process and increase the productivity of rail transport. Ultimately it also contributes to increasing the competitiveness of the transport route.

## Cluster 1 - Last mile connections: overview of needs and good practices in cooperation with stakeholders to develop the action plan

The existence of a direct link to the highway network with the container terminal demonstrates the strength and precondition for the development of the terminal. Although in a competitive relationship with the railway, the existence of high capacity infrastructure is necessary for the development of the terminal and its competitiveness. In this meaning, a major strength is the liberalized rail cargo market, which has contributed to raising the quality of service while regulating the efficiency and cost of rail transport. However, the existing railway infrastructure on the routes to Hungary and Slovenia has significant limitations that make up the weaknesses of the entire Rijeka traffic direction. In the first place, there are large slopes and small radius of infrastructure, which is not suitable for long and heavy trains necessary to ensure the competitiveness of transport. The current minimum block-trains on which operators of competing Northern Adriatic ports base their offer are trains of a length of at least 550 meters and weighs 1.500 tons. Infrastructure to Slovenia is limited by axle load, while the direction towards Zagreb is embedded with large slopes and small radius that slow down and make transport more difficult. Rijeka - Pivka part is divided into two subdivisions: Rijeka - Šapjane (30.9 km) with the highest load of 22.5 tons per axle, and Šapjane - Pivka (25.4 km) with the maximum permissible load of only 20 tons per axle. Because of this smaller, under-standard capacity and the ability to board cargo per wagon, the route across Rijeka is less competitive than the route through Koper. Simply put, railway charges (potential cargo from Austria, Czech Republic ...) are higher over Rijeka than by Koper, due to this weight limit (narrow throat) on a short railway section from Šapjane to Pivka. This is especially important for general cargo. An additional problem is the non-functioning of the existing communication and safety subsystems on the railway lines, namely the

absence of a central rail traffic management system. In the section of the railway infrastructure at the terminal itself and in the immediate vicinity, there are also weaknesses related to the insufficient length of the track and the inability to form a whole train block in a total length of at least 550 meters, which necessarily increases the cost of transport due to the use of 2 locomotives and the transport of two compositions to where two compositions are combined in a unique block train composition. Another negative consequence is the increased transit time resulting from the transport of the composition from the port terminal to the outposts outside the port where a unique block train is formed. An additional problem is allowed from the terminal block to the Sušak station of 20 t instead of 22.5 t and the inability to use the appropriate transshipment mechanism at the terminal (RMG). These are the basic infrastructure weaknesses of the reduced competitive position of the Rijeka container terminal in relation to competing ports.

At the same time, competitive North Adriatic ports have infrastructure that allows the formation of a full block train at the terminal and its dispatch to targeted markets. Additional threats are a tight space in the terminal environment that prevents future blockage of the entire block of cargo on the container terminals at Brajdica and the Zagrebačka obala (Zagreb coast).

Action	Main challenges tackled	Results to be achieved	Tasks to be performed	Key actors	Timeline and financial resources	Expected results	References
Resolving railway infrastructure on the routes towards Budapest and Ljubljana	A current state of the infrastructure greatly affects the speed of transport and the composition capacity.	Enable faster transport and longer length of the composition, from 750 m and 2100 gross tones.	<ul style="list-style-type: none"> <li>- analyze the current state</li> <li>- to create technical documentation</li> <li>- to establish bilateral negotiations with the Republic of Slovenia</li> <li>- provide financial resources with the option of using European Union financial instruments</li> </ul>	Ministry of the Sea, Transport and Infrastructure	2021	<p>Increase in container traffic</p> <p>Increased competitiveness of the traffic direction</p>	Own research
Provide a full profile of the highway from Rupa to Postojna	Currently, there is a four-lane highway from the Port of Rijeka to the border with the Republic of Slovenia (Rupa), but a two-lane state road continues from the border to Postojna (Slovenia), which automatically decreases the speed, capacity, safety and reliability of the transport.	It is needed to build four-lane highway from the border to Postojna (Slovenia), in order to ensure reliable and safe road connection of the Port of Rijeka and Central Europe.	<ul style="list-style-type: none"> <li>- to establish bilateral negotiations with the Republic of Slovenia</li> <li>- at the European Commission level emphasize the importance of removing road narrow gaps in main traffic directions</li> </ul>	Ministry of the Sea, Transport and Infrastructure	2021	Increased competitiveness of the traffic direction	Own research

## Cluster 2 - Multimodal nodes optimization: overview of needs and good practices in cooperation with stakeholders to develop the action plan

There are a number of specific weaknesses in the Rijeka container terminal that directly affect the efficiency of terminal operation and thus its competitive relationship. First of all, this concerns the absence of a common administrative system for all participants in the Port community system. It is obvious that the terminal's performance suffers from the lack of an integrated information platform that enables secure and rapid communication of all stakeholders in the performance of administrative procedures. At this point, several stakeholders have their own information system that rarely communicates with other information systems, and if so, it is done by manual transmission. This results in a disadvantage in which the stakeholders are not familiar with the current state of data processing at another stakeholder, and instead, accelerating the procedure, achieves inefficiency of working hours and prolongs processing time. Otherwise, having an integral IT interface with clear levels of visibility of data for a variety of stakeholders, stakeholders can see information on processing status at their predecessors and optimally plan workforce and equipment and make it timely available. The implementation of the "Technical Assistance in Design and Implementation of PCS" co-funded by the Connecting Europe Facility programme should overcome this terminal weakness.

In this sense, the lack of electronic communication between railway operators and terminal operators is a major disadvantage. The efficiency of the terminal could be greatly increased when the arrival of the train with the containers was announced through the system and delivered by supporting documentation on wagons and containers. This

information is currently available but is not delivered to shareholders in advance but on the physical arrival of the train. Unfortunately, this means that train dispatchers and station staff have information on train composition when the train arrives physically. Planning is in this case difficult, usually the resources are misdiagnosed, resulting in reduced terminal efficiency. In addition, information at the level of analysis rarely converts to decision support because collection methods are not self-determined and verifiable.

In organizing terminal operations, the recognized weakness is the unharmonized working hours of all stakeholders. Unfortunately, different inspection services (customs, police, sanitary, etc.) and terminal operators begin and end shifts at different times. In addition, some of the stakeholders do not have 24-hour work, which further shortens the effective time of cargo handling. This has a direct consequence of reduced terminal efficiency and reduced competitiveness.

Action	Main challenges tackled	Results to be achieved	Tasks to be performed	Key actors	Timeline and financial resources	Expected results	References
Synchronize working hours of all stakeholders in the port	In the Port of Rijeka there is a currently present issue of slowdown in work during the shift change, caused by desynchronization of the working hours of the key office services in the port.	The synchronization of the start and end times of working hours would ensure minimal slowdowns during shift changes and increase the efficacy of the port service.	<ul style="list-style-type: none"> <li>- analyze the current state</li> <li>- to make a synchronization proposal</li> <li>- to meet representatives of stakeholders and responsible ministries (MSTI, MI, MF etc.) with the proposal and the necessity of synchronization</li> <li>- to promote a proposal to final synchronization with the government's decision to change working hours</li> </ul>	Rijeka Port Authority	2020	<p>Increased productivity and reduced shipping time</p> <p>Increased competitiveness of the traffic direction</p>	Own research
Enabling formation of 550 m long block train on the Brajdica container terminal	Railway infrastructure in the Port of Rijeka does not enable formation of the complete block-train of minimal length of 550 meters, which directly affects the time of wagon embarkation and the total transit time.	The construction of railway infrastructure which would enable the formation of the complete block-train on the container yard.	<ul style="list-style-type: none"> <li>- analyze the current state</li> <li>- design and upgrade the length of the track on the stations to Moravice</li> </ul>	Rijeka Port Authority, HŽ Infrastruktura Ltd., Ministry of the Sea, Transport and Infrastructure	2020	Increase in container traffic by 2021	Own research
Enable crossover of rail-terminal containers using existing RMG cranes	For the container embarkation, reachstackers are used that are far more ineffective compared to the existing RMG cranes that have never been used.	The construction of the railway infrastructure which would enable a crossover of rail-terminal containers using existing RMG cranes	<ul style="list-style-type: none"> <li>- reconstruct the railway track at the Brajdica container terminal</li> <li>- to include the existing RMG crane</li> </ul>	AGCT Ltd.	2020	Shortened transshipping time	Own research
Ensure <i>Port Community System</i>	Currently, there is no Port Community System in the Port of Rijeka	Develop and implement Port Community System	- to implement the project to set up the Port Community System	Ministry of the Sea, Transport and Infrastructure, Rijeka Port Authority	2020	<p>Shortened transshipping time</p> <p>Increased competitiveness of the traffic direction</p>	Own research

<p>Enable automatic electronic announcement of the wagon in the port</p>	<p>According to the current way of operating, there are no existent automatic announcements of train arrivals intended for stakeholders, in order to prepare themselves and optimize their work and resources. On the contrary, the transshipment operations are organized at the moment when the train arrives at the terminal.</p>	<p>Enable electronic system that will automatically announce the arrival of a train, intended for all the stakeholders involved in the transshipment</p>	<ul style="list-style-type: none"> <li>- to make a professional elaboration of possible technological solutions</li> <li>- involve stakeholders in developing an optimal technological solution</li> <li>- provide financial resources with the option of using European Union financial instruments</li> </ul>	<p>HŽ Infrastruktura Ltd., railway operators, Rijeka Port Authority, Luka Rijeka Plc., AGCT Ltd.</p>	<p>2020</p>	<p>Shortened transshipping time Increased competitiveness of the traffic direction</p>	<p>Own research</p>
<p>IT railway-linked programme to optimize the cargo schedule</p>	<p>When loading cargo on wagons, it is extremely important to optimize loading in relation to the wagon capacity. The current mode is that operators, according to experience and using simple Excel table, create wagon utilization calculation and loading plan. Such primitive work cannot ensure the ideal utilization of wagon capacity. The result is a loss of space and capacity on the wagon, inefficient work and transport by rail.</p>	<p>To create tailor-made software that will independently calculate the loading plan based on cargo and wagon data. This will speed up the loading process and increase the productivity of rail transport. Ultimately it also contributes to increasing the competitiveness of the transport route.</p>	<ul style="list-style-type: none"> <li>- analyze the processes and define necessary steps</li> <li>- develop software</li> <li>- test software</li> <li>- educate involved stakeholders</li> </ul>	<p>railway operators, Rijeka Port Authority, AGCT Ltd.</p>	<p>2020</p>	<p>Shortened transshipping time Increased competitiveness of the traffic direction</p>	<p>Own research</p>



## Cluster 3 - New multimodal services: overview of needs and good practices in cooperation with stakeholders to develop the action plan

There are a large number of stakeholders in the port, and the result of the restructuring that took place in the port is that every stakeholder is closely aligned with his goals. Although it is perfect for all interested parties to believe in a greater and better future, there is no unification force to coordinate efforts. Railways, shippers, clients, terminal operators and the Port Authority itself are concerned about their own performance and have no unified project management impact or vision setting. Of course, there is no unique marketing vision and projection of port capabilities. These are the elements that are recognized as the weaknesses of better utilization of opportunity and affirmation of traffic through the Rijeka traffic direction.

The solution is in coordinated promotion at the regional and traffic levels according to targeted markets. It's a promotion on several levels. The first relates to the overall promotion of the Rijeka port as a transport center, next to the promotion of transport services from the port of Rijeka to the final destinations in the targeted markets, the third individual promotion of each stakeholder and the last, regional promotion of the North Adriatic port cluster. At all levels of promotion, it is necessary to set clear vision and goal and systematic coordination. Coordination must be actively taken over by the Port Authority as a commercially neutral institution responsible for the management of maritime affairs of general interest and development of the traffic direction. Coordination is preceded by an analysis of the needs of the target markets, the main stakeholders and the development of a promotion strategy at all levels. Given the inconsistency of all stakeholders and their passivity so far, it is understandable that the stakeholders do not

have the importance of promotion or the knowledge required. For this purpose there are a large number of mentioned European financial instruments through which funds can be provided to systematically educate stakeholders and necessary promotional activities.

A valuable example of successful promotion is port representatives in targeted markets. In the previous analysis, examples of several Northern European ports and the activities of these representations were given. This is the direction that systematic promotion should go. There is a problem that the effect of promotional activities is difficult to measure, but the effect of the representation is virtually measurable through the contribution of traffic that increased during the period of the mission representation compared to the reference year.

Action	Main challenges tackled	Results to be achieved	Tasks to be performed	Key actors	Timeline and financial resources	Expected results	References
Analyze and promote the launch of feeder service Rijeka (hub port)-Split-Ploče-Bar-Durres-Ancona-Ravenna	There is a portion of cargo load intended for the ports of Split, Ploče, Bar, Durres, Ancona, and Ravenna, which could enable additional quantities for the Port of Rijeka.	Enable new feeder service Rijeka (hub port)-Split-Ploče-Bar-Durres-Ancona-Ravenna	<ul style="list-style-type: none"> <li>- analyze the current state, quantity, market potential and ship-owner interest</li> <li>- to make a study of economic justification</li> <li>- to promote conclusions among shipping companies</li> <li>- to analyze the possibilities of using cross-border programs (Interreg ADRION, MED, Italy-Croatia) for the analysis and support of launching the service (promotion, initial co-financing etc.)</li> </ul>	Rijeka Port Authority	2020	Increase in container traffic by 2021	Own research
Provide a sales network in the gravitational area	Currently, there is no systematic and effective local promotion on the key markets of the Port of Rijeka	Ensure a sales network of representatives on the key markets	<ul style="list-style-type: none"> <li>- determine the target market</li> <li>- open a representative office</li> <li>- to maintain contacts with numerous companies in trade and industry, with carriers, forwarders, shipping agencies, operators and rail companies in the transport and logistics sector, trade associations and political decision-makers,</li> <li>- an analysis of potential buyers, organizations,</li> <li>- preparation of visits and events for buyers,</li> <li>- exchange of market information, data and contacts,</li> <li>- a visit by a buyer from a country where there is a representative office,</li> <li>- tracking the business delegation of the port in the country where there is a representative office.</li> </ul>	Rijeka Port Authority, concessionaire	2020	Increased competitiveness of the traffic direction	Own research