

ACTION PLAN FOR FOSTERING COORDINATED
MULTIMODAL FREIGHT TRANSPORT THROUGH ICT
SYSTEMS - PORTS OF HUNGARY

DELIVERABLE D.T3.2.8

Version 1

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1. Introduction

Considering the results of the pilot action, it breaks down the goals of the strategy and wish list (WPT1) in specific tasks, KPIs, time line, identification of financial resources and definition of responsible actors.

WPT3 lays the basis of an operational framework for coordinated multimodal freight transport through ICT in Central Europe.

Based on a common transnational concept, the outcomes of the pilot actions on ICT for coordinated multimodal freight transport (O.T2.1) allow to convert the wish lists of the strategies developed within WPT1 (O.T1.2) into specific Action Plans (APs) for fostering coordinated multimodal freight transport through ICT, breaking down the goals of the strategies and wish lists into specific tasks, KPIs, time line, including the identification of the necessary financial resources, potential sources of funding and the definition of the responsible actors.

In addition to this, the outcomes of the knowledge tool (O.T1.1), the strategies (O.T1.2), the pilot actions (O.T2.1) and the action plans (O.T3.1) are embedded into a transnational toolbox for fostering multimodal freight transport through ICT systems in CE, comprising methods, concepts, guidelines, advices on ICT technologies to be adopted, governance structures and impacts, widely transferable in CE and beyond.

Each PP involves the identified stakeholders - terminal and logistic operators, railway companies, policy makers - through ad-hoc meetings of LSNs both for the elaboration of the APs and definition of the tool.

WPT3 is led by Luka Koper (PP5) with the full support and contribution of the whole partnership.

2. Executive summary

This document includes the action plan fostering coordinated multimodal freight transport through ICT systems in the Danube ports of Hungary.

In the Strategy for Fostering Coordinated Multimodal Freight Transport through ICT Systems in Hungary the following goals and the Wishlist of measures were defined as follows.

Medium term (5 years):

1. Goal no. 1: Establishing National Integrated Port Management Information System
2. Goal no. 2: IWT Loading Plan Software
3. Goal no. 3: Adopting common Upper Rhein Container List

Long term (10 years):

1. Goal no. 4: Automatization of ports, Industry 4.0 solutions
2. Goal no. 5: Danube Ports Information System integration

In the Action Plan five project ideas are analysed and detailed for strategic planning. Different budget and size of projects are envisioned and supports the decision-makers to choose from the projects.

The following ideas are innovative but should be developed:

- Automatization, Industry 4.0 port solution pilot
- Port Blockchain pilot

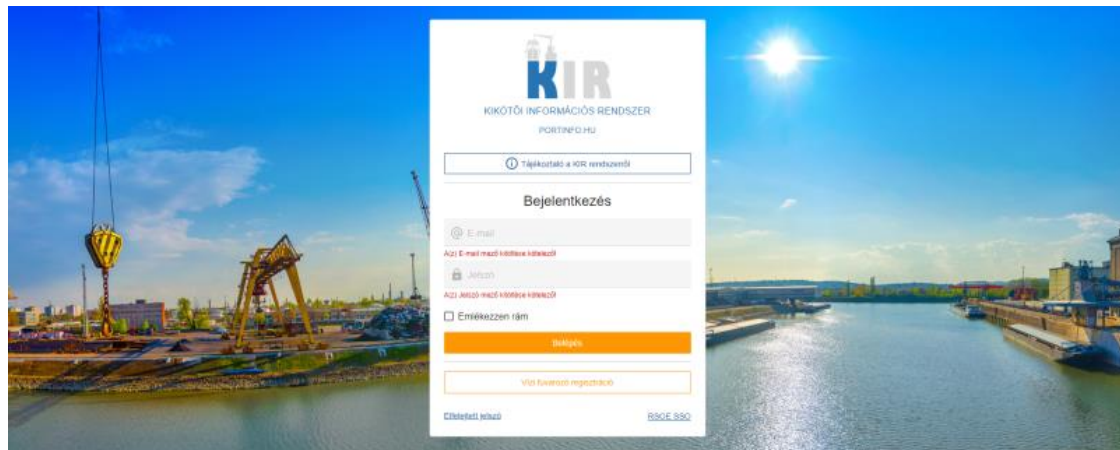


The following project plans are prepared or will be developed in the near future:

- Enhancing port communication with road transport in KIR national system
- Masterplan and pilot for Danube Ports Information System

The last project idea is based on the results of the fourth project strongly:

- Danube Ports Information System implementation





3. The strategy and the pilot action

In the Strategy for Fostering Coordinated Multimodal Freight Transport through ICT Systems in Hungary the following goals and the Wishlist of measures were defined as follows.

Medium term (5 years):

4. Goal no. 1: Establishing National Integrated Port Management Information System
5. Goal no. 2: IWT Loading Plan Software
6. Goal no. 3: Adopting common Upper Rhein Container List

Long term (10 years):

3. Goal no. 4: Automatization of ports, Industry 4.0 solutions
4. Goal no. 5: Danube Ports Information System integration

Goal no. 1: Establishing National Integrated Port Management Information System

| Perspectives | Goal | Measurement |
|---|---|--|
| 1. Environmental and safety perspective | Port management system will also enhance the environmental and safety aspects of the ports. | Environmental: less pollution incident because electronic reporting Safety: Enhanced and more effective monitoring will conclude less conflict issues, e.g. by using fee calculator, electronic log |
| 2. Internal processes perspectives | Improvement of internal processes will be necessary because introduction of new system. | More effective and modernised processes can be measured by reduced time and efforts port processes. |
| 3. Innovation and growth perspective | Digitalisation will bring innovation and growth possibilities. | Number of partner users (e.g. truck drivers) growth will measure effectivity of the system and innovation level. |
| 4. Customer / Partner perspective | Improved and more comfortable modern services will raise customer satisfaction. | Customer acceptance of the system and satisfaction can be measured by surveys or feedbacks. |
| 5. Financial perspective | Effectivity and satisfaction growth will lead to financial increase as well. | Financial income or port traffic volumes can be measured. |

VISION:

The Hungarian Danube ports shall become significant and effective multimodal hubs until 2030 in their region's transport system capable to transport the 10% of the domestic freight traffic on the environmental friendly inland waterways.



The first goal is to provide a national port management information system framework for Hungary to modernize, digitalise port operations and to harmonise statistics and port log systems. In order to increase competitiveness several modules of the system will support the daily activities of the terminal and port operators.

Goal no. 2: IWT Loading Plan Software

| Perspectives | Goal | Measurement |
|---|--|--|
| 1. Environmental and safety perspective | IWT Loading Plan Software will increase safety of container ships and container terminals. | Safety: Enhanced and modernised container plan will improve safety by reducing problems in loading and unloading. |
| 2. Internal processes perspectives | Improvement of internal processes will be necessary because introduction of software. | More effective and modernised processes can be measured by reduced time and efforts at loading and unloadings. |
| 3. Innovation and growth perspective | Modern software will bring innovation and growth possibilities. | Number of partner users growth will measure effectivity of the service and innovation level. |
| 4. Customer / Partner perspective | Improved and more comfortable modern services will raise customer satisfaction. | Customer acceptance of the system and satisfaction can be measured by surveys or feedbacks. |
| 5. Financial perspective | Effectivity and satisfaction growth will lead to financial increase as well. | Financial income or port traffic volumes can be measured. |
| <p>VISION: The Hungarian Danube ports shall become significant and effective multimodal hubs until 2030 in their region's transport system capable to transport the 10% of the domestic freight traffic on the environmental friendly inland waterways.</p> | | |

The second goal is to provide a harmonised loading plan solution, which does not exist yet for the Danube. This software solution will support the daily operation of ship captains and terminals.

Goal no. 3: Adopting common Upper Rhein Container List

| Perspectives | Goal | Measurement |
|---|--|---|
| 1. Environmental and safety perspective | Internationally standardised format will have more effective safety. | Safety: Enhanced and more effective monitoring will conclude less conflict issues |
| 2. Internal processes perspectives | Improvement of internal processes will be necessary because introduction of new data format. | Number of foreign ports using this data format. |
| 3. Innovation and growth perspective | Digitalisation will bring innovation and growth possibilities. | Number of partner users growth will measure effectivity of the system and innovation level. |



| | | |
|-----------------------------------|--|---|
| 4. Customer / Partner perspective | Internationally standardised modern services will raise customer satisfaction. | Customer acceptance of the system and satisfaction can be measured by surveys or feedbacks. |
| 5. Financial perspective | Effectivity and satisfaction growth will lead to financial increase as well. | Financial income or port traffic volumes can be measured. |

VISION:

The Hungarian Danube ports shall become significant and effective multimodal hubs until 2030 in their region's transport system capable to transport the 10% of the domestic freight traffic on the environmental friendly inland waterways.

It is important to harmonise and standardise data formats between the Rhein and the Danube. According to this goal the standardised Rhein data format will be analysed and adopted for Hungary. The harmonisation will increase competitiveness and better processing of logistics data.

Goal no. 4: Automatization of ports, Industry 4.0 solutions

| Perspectives | Goal | Measurement |
|---|--|--|
| 1. Environmental and safety perspective | Automatization will also enhance the environmental and safety aspects of the ports. Reduction of human factor mistakes or problems. New safety rules will be needed. | Environmental: less pollution incident because electronic reporting Safety: Enhanced and more effective processes will conclude less human factor accidents and problems. |
| 2. Internal processes perspectives | Improvement of internal processes will be necessary because introduction of new services. | More effective and modernised processes can be measured by reduced time and efforts port processes. |
| 3. Innovation and growth perspective | Automatization will bring innovation and growth possibilities. | Time and cost reduction. |
| 4. Customer / Partner perspective | Improved and more comfortable modern services will raise customer satisfaction. | Customer acceptance of the system and satisfaction can be measured by surveys or feedbacks. |
| 5. Financial perspective | Cost saving and more effective automatization. | Financial cost reduction can be measured. |

VISION:

The Hungarian Danube ports shall become significant and effective multimodal hubs until 2030 in their region's transport system capable to transport the 10% of the domestic freight traffic on the environmental friendly inland waterways.

Based on the National Port Development Masterplan it is a priority to boost automatization and Industry 4.0 solutions in port operations. The innovation increases competitiveness and effectivity of port operations.



Goal no. 5: Danube Ports Information System integration

| Perspectives | Goal | Measurement |
|---|--|--|
| 1. Environmental and safety perspective | Danube port management system will also enhance the environmental and safety aspects of the ports. Cooperation with other Danube ports. | Environmental: less pollution incident because electronic reporting Safety: Enhanced and more effective monitoring will conclude effective international processes. |
| 2. Internal processes perspectives | Improvement of internal processes will be necessary because introduction of new international system. | More effective and modernised processes can be measured by reduced time and efforts port processes. |
| 3. Innovation and growth perspective | Digitalisation will bring innovation and growth possibilities. | Number of cross border Danube ports involved. |
| 4. Customer / Partner perspective | Cross border modern Danube services will raise customer satisfaction. | Customer acceptance of the system and satisfaction can be measured by surveys or feedbacks. |
| 5. Financial perspective | Effectivity and satisfaction growth will lead to financial increase as well. | Financial income or port traffic volumes can be measured. |
| <p>VISION: The Hungarian Danube ports shall become significant and effective multimodal hubs until 2030 in their region's transport system capable to transport the 10% of the domestic freight traffic on the environmental friendly inland waterways.</p> | | |

The Danube transnational transport corridor would need a harmonised and integrated information system to manage cross border transport effectively. Hence the riparian countries ports and national administrations shall make efforts to harmonise their system and interconnect them. The Danube Ports Network will serve as perfect basis for this.

| Wishlist of ICT measures | | | |
|--------------------------|---|---|---|
| Title | Short description | Link to the strategic goal | Link to the pilot action |
| 1. | Integrated Port Information System in Hungary (KIR) | Goal no. 1: Establishing National Integrated Port Management Information System | ongoing project, cooperation with COMODALCE pilot |
| 2. | IWT Loading Plan Software | Goal no. 2: IWT Loading Plan Software | part of COMODALCE pilot (WPT2) |



| | | | |
|----|---|---|--------------------------------|
| 3. | Adopting common Upper Rhein Container List | Goal no. 3: Adopting common Upper Rhein Container List | part of COMODALCE pilot (WPT2) |
| 4. | Automatization of ports, Industry 4.0 solutions | Goal no. 4: Automatization of ports, Industry 4.0 solutions | - |
| 5. | Danube Ports Information System integration | Goal no. 5: Danube Ports Information System integration | - |

Container loading plan software and Container List data harmonisation pilots

The results of the pilot software development and harmonisation are available port and logistics users of the KIR national system. Conclusion is that the workflow became more transparent, modern and user friendly. Administrative burdens have been reduced and communication between the parties has become more efficient.

Deck 1

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC |
| 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC |
| 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC |
| 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC |
| 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC |

Deck 2

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC |
| 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC |
| 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC |
| 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC |
| 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC | 40HC |

KIR System Container Plan design screenshot (portinfo.hu)



4. Identification of the actions

4.1. Mapping the actions

| ACTION/MEASURE | ESTIMATED COST | TIME HORIZON |
|---|----------------------------|--------------------------|
| Automatization, Industry 4.0 port solution pilot | 400 000 - 1 000 000 EUR | 2026 (36 Months project) |
| Port Blockchain pilot | 250 000 - 500 000 EUR | 2026 (36 Months project) |
| Enhancing port communication with road transport in KIR national system | 200 000 EUR | 2025 (36 Months project) |
| Masterplan and pilot for Danube Ports Information System | 1 000 000 - 3 000 000 EUR | 2026 (48 Months project) |
| Danube Ports Information System implementation | 4 000 000 - 10 000 000 EUR | 2030 (48 Months project) |

4.2. Setting the actions

The Actions are identified and detailed here below.



Action no. 1: Automatization, Industry 4.0 port solution pilot

Description of action/measure

Describe the action foreseen and the expected results from its implementation

Based on the Hungarian Port Masterplan (Sub Chapter 4.3) automatization and introduction of Industry 4.0 is a priority in Hungarian port strategy.

Nine pillars of the technological advance that form the foundation of Industry 4.0 are (Rüßmann):

- i) autonomous robots and systems,
- ii) Internet of Things (IoT),
- iii) Cybersecurity,
- iv) Horizontal and Vertical System Integration (HVSII) through new standards,
- v) Cloud Computing (CC),
- vi) 3D printing (3DP) and Additive Manufacturing (AM),
- vii) Big Data (BD) and Business Analytics,
- viii) Augmented Reality (AR),
- ix) Simulation and Modelling (S&M).



| | |
|---|--|
| | <p>The planned pilot project will analyse the available Industry 4.0 technologies for inland ports and will implement some services in order to prove how digitalisation can support daily port processes and activities.</p> <p>It will contribute to:</p> <ul style="list-style-type: none"> - increasing of efficiency, - enhancement of operational safety, - improvement of operational sustainability, - improvement of operational maintenance. |
| <p>Description of the main steps for its implementation <i>List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc...)</i></p> | <ol style="list-style-type: none"> 1. Analysis and inventory of Industry 4.0 technologies and solutions for ports 2. Design of 4.0 pilot services 3. Implementation of 4.0 pilot services in Danube ports (including tendering procedure) 4. Evaluation and exploitation of 4.0 Danube port pilots 5. Dissemination of results, know-how exchange with maritime and inland ports |
| <p>Stakeholders involved <i>List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?</i></p> | <p>Direct beneficiaries:</p> <ul style="list-style-type: none"> - Hungarian Danube port and terminal operators - Hungarian Federation of Danube Ports (HFIP) <p>Indirect beneficiaries:</p> <ul style="list-style-type: none"> - Logistics actors in connection with inland ports - Ministry responsible for transport - Inland navigation sector - RSOE - Relevant ICT service supplier companies |
| <p>Timeline <i>Indicate the time horizon for the implementation of the action</i></p> | <p>2022: Project planning 2023: Project development and application for funding 2024: Design Phase of project 2025: Implementation phase of project 2026: Evaluation, exploitation and dissemination phase of project</p> |
| <p>Investment cost <i>How much will cost the construction/realization of the future initiative/action/technology?</i></p> | <p>400 000 - 1 000 000 EUR (total project budget)</p> |
| <p>Sources of financing <i>What are the sources of financing? Private capital, public capital, CEF, etc...</i></p> | <p>EU Connecting Europe Facility 2 or EU Horizon Europe or</p> |



| | |
|--|--|
| <p><i>How much is the share covered by each of them?</i></p> | <p>Private funds of the ports</p> |
| <p>Impact of the initiative <i>Describe the expected future economic, social, environmental impacts of this initiative</i></p> | <p>Economic The reduction of redundant waiting times and the increase of efficiency will lead to significant cost and time saving for the port companies and organizations.</p> <p>Social Digitalisation of port processes will support everyday life of the people working in the port and logistics sector.</p> <p>Environmental Digital monitoring and tracking of activities and green processes will contribute to a sustainable, greener port.</p> |
| <p>KPIs <i>Please identify the KPI to be used for measuring the action's impact</i></p> | <p>KPI1: Industry 4.0 technologies introduced (before-after %)</p> <p>KPI2: Enhancement of efficiency ratio - reduction of time spent with administration (%)</p> <p>KPI3: Increase of number of companies/organizations using Industry 4.0 technologies (before-after %)</p> |



| Action no. 2: Port Blockchain pilot | |
|---|--|
| <p>Description of action/measure <i>Describe the action foreseen and the expected results from its implementation</i></p> | <p>The blockchain technology refers to “a distributed database of records, or public ledger of all transactions or digital events that have been executed and shared among participating parties”(M. Crosby, 2016).</p> <p>Digitalization and blockchain will lead to reduction of paper administration. Cross-border commercial procedures and Danubian traditional paperwork are dominant that can be reduced and process could be more efficient. Blockchain can be adopted to track the movements of cargo.</p> |
| <p>Description of the main steps for its implementation <i>List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc...)</i></p> | <ol style="list-style-type: none"> 1. Analysis data and processes 2. Design of Blockchain pilot service 3. Implementation of Blockchain pilot service in Danube ports (including tendering procedure) 4. Evaluation and exploitation of Blockchain Danube port pilots 5. Dissemination of results, know-how exchange with maritime and inland ports |
| <p>Stakeholders involved <i>List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?</i></p> | <p>Direct beneficiaries:</p> <ul style="list-style-type: none"> - Hungarian Danube port and terminal operators - Hungarian Federation of Danube Ports (HFIP) <p>Indirect beneficiaries:</p> <ul style="list-style-type: none"> - Logistics actors in connection with inland ports - Ministry responsible for transport - Inland navigation sector - RSOE - Relevant ICT service supplier companies |
| <p>Timeline <i>Indicate the time horizon for the implementation of the action</i></p> | <p>2022: Project planning 2023: Project development and application for funding 2024: Design Phase of project 2025: Implementation phase of project 2026: Evaluation, exploitation and dissemination phase of project</p> |



| | |
|---|---|
| <p>Investment cost <i>How much will cost the construction/realization of the future initiative/action/technology?</i></p> | <p>250 000 - 500 000 EUR (total project budget)</p> |
| <p>Sources of financing <i>What are the sources of financing? Private capital, public capital, CEF, etc...</i> <i>How much is the share covered by each of them?</i></p> | <p>EU Connecting Europe Facility 2 or EU Horizon Europe or Private funds of the ports</p> |
| <p>Impact of the initiative <i>Describe the expected future economic, social, environmental impacts of this initiative</i></p> | <p>Economic The reduction of paperwork and the increase of efficiency will lead to significant cost and time saving for the Blockchain user companies and organizations.</p> <p>Social Digitalisation of port processes will support everyday life of the people working in the port and logistics sector.</p> <p>Environmental Digital monitoring and tracking of activities and green processes will contribute to a sustainable, greener port.</p> |
| <p>KPIs <i>Please identify the KPI to be used for measuring the action's impact</i></p> | <p>KPI1: Paperwork reduction ratio - Number of less paper document used (before-after %)</p> <p>KPI2: Enhancement of efficiency ratio - reduction of time spent with administration (%)</p> <p>KPI3: Increase of number of companies/organizations using Blockchain (before-after %)</p> |



| Action no. 3: Enhancing port communication with road transport in KIR national system | |
|---|--|
| <p>Description of action/measure <i>Describe the action foreseen and the expected results from its implementation</i></p> | <p>Presently it is possible to pre-register trucks and call them to enter the port in the national Integrated Port Management System - KIR system.</p> <p>The pilot development planned aims to manage the complete entering and exiting process of the trucks and provide guidance for the driver to reach the loading/unloading points. Special interfaces will be specified and developed to connect to terminal information system and sensors and displays. The truck guidance and communication development will use and further develop the KIR mobile application also.</p> <p>It is expected to reduce waiting times and seasonal congestion of trucks.</p> |
| <p>Description of the main steps for its implementation <i>List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc...)</i></p> | <ol style="list-style-type: none"> 1. Strategic planning 2. Implementation of pilot 3. Evaluation of pilot |
| <p>Stakeholders involved <i>List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?</i></p> | <p>Direct beneficiaries:</p> <ul style="list-style-type: none"> - Hungarian Danube port and terminal operators - Road transport carriers - Hungarian Federation of Danube Ports (HFIP) <p>Indirect beneficiaries:</p> <ul style="list-style-type: none"> - Logistics actors in connection with inland ports - Ministry responsible for transport - RSOE |
| <p>Timeline <i>Indicate the time horizon for the implementation of the action</i></p> | <p>2022: Project planning and development with partners, application for funding</p> <p>2023: Strategic planning phase of the project</p> <p>2024: Implementation of pilot phase of the project</p> <p>2025: Evaluation of pilot phase of the project</p> |



| | |
|--|--|
| <p>Investment cost <i>How much will cost the construction/realization of the future initiative/action/technology?</i></p> | <p>200 000 EUR (KIR Road Transport pilot only)</p> |
| <p>Sources of financing <i>What are the sources of financing? Private capital, public capital, CEF, etc... How much is the share covered by each of them?</i></p> | <p>EU Central Europe (project proposal under elaboration)</p> |
| <p>Impact of the initiative <i>Describe the expected future economic, social, environmental impacts of this initiative</i></p> | <p>Economic The reduction of waiting times and the increase of efficiency will lead to significant cost and time saving for both port and road transport carriers.</p> <p>Social Digitalisation of port processes will support everyday life of the people working in the port and logistics sector especially the truck drivers.</p> <p>Environmental Less waiting times and reduced congestion of trucks will contribute to a sustainable, greener port.</p> |
| <p>KPIs <i>Please identify the KPI to be used for measuring the action's impact</i></p> | <p>KPI1: Reduction of truck average waiting times per visit (minute)</p> <p>KPI2: Number of downloads of KIR mobile applications by truck drivers</p> |



MASTERPLAN

| Action no. 4: Masterplan and pilot for Danube Ports Information System | |
|---|--|
| <p>Description of action/measure <i>Describe the action foreseen and the expected results from its implementation</i></p> | <p>Based on national experiences (e.g. KIR system in Hungary) and the Rhein (RPIS CEF project) an integrated Danube Ports Information System will be designed and some key services will be pilot implemented to gain experience for the final implementation of the Danube-wide system.</p> <p>After analysis of national and transnational inland and maritime port systems a transnational corridor approach concept shall be developed with clear interfaces to RIS and other public and private inland navigation and logistics information systems.</p> <p>Special services will be designed and implemented as pilots. The pilot services shall be evaluated and results will be integrated into the final Danube concept. Feasibility study shall be also elaborated for final implementation.</p> |
| <p>Description of the main steps for its implementation <i>List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc...)</i></p> | <ol style="list-style-type: none"> 1. Analysis of national and transnational inland and maritime port systems 2. Transnational Danube corridor concept (Masterplan) 3. Design of pilot services 4. Implementation of pilot services 5. Evaluation of pilot services 6. Update of Danube concept (Masterplan) 7. Feasibility study for implementation 8. Exploitation and dissemination |
| <p>Stakeholders involved <i>List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?</i></p> | <p>Direct beneficiaries:</p> <ul style="list-style-type: none"> - Danube port and terminal operators - Danube Port Network <p>Indirect beneficiaries:</p> <ul style="list-style-type: none"> - Logistics actors in connection with inland ports - Ministries responsible for transport - RSOE - ProDanube |



| | |
|---|--|
| <p>Timeline <i>Indicate the time horizon for the implementation of the action</i></p> | <p>2022: Project planning and development with partners, application for funding 2023: Analysis 2024: Concept 2025: Pilot design and implementation, evaluation 2026: Update of concept, feasibility study, dissemination</p> |
| <p>Investment cost <i>How much will cost the construction/realization of the future initiative/action/technology?</i></p> | <p>1 000 000 - 3 000 000 EUR (total project budget, depending on number of partners and pilots)</p> |
| <p>Sources of financing <i>What are the sources of financing? Private capital, public capital, CEF, etc...</i> <i>How much is the share covered by each of them?</i></p> | <p>Connecting Europe Facility 2 (Call 2022)</p> |
| <p>Impact of the initiative <i>Describe the expected future economic, social, environmental impacts of this initiative</i></p> | <p>Economic The increase of efficiency and modernisation of procedures will lead to significant cost and time saving for ports and logistics.</p> <p>Social Digitalisation of port processes will support everyday life of the people working in the port and logistics.</p> <p>Environmental Digitalisation of ports will contribute to a sustainable, greener port operation also.</p> |
| <p>KPIs <i>Please identify the KPI to be used for measuring the action's impact</i></p> | <p>KPI1: Number of new modern, digital port services identified</p> <p>KPI2: Number of pilot services implemented</p> <p>KPI3: Number of countries planned to be involved in new system</p> |



IMPLEMENTATION

| Action no. 5: Danube Ports Information System implementation | |
|---|--|
| <p>Description of action/measure <i>Describe the action foreseen and the expected results from its implementation</i></p> | <p>Based on Danube Ports Information System Masterplan project results the implementation of transnational Danube system will be realised.</p> <p>It is expected to better integrate port services in the Danube transport corridor. Harmonisation and standardisation of digital port services will conclude in an efficient and competitive and modern port management operation along the Danube.</p> |
| <p>Description of the main steps for its implementation <i>List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc...)</i></p> | <ol style="list-style-type: none"> 1. Technical design of Danube system (based on Masterplan) 2. Implementation of system (including tendering) 3. Test of system services 4. Evaluation of tests 5. Validation, introduction of services 6. Exploitation and dissemination |
| <p>Stakeholders involved <i>List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?</i></p> | <p>Direct beneficiaries:</p> <ul style="list-style-type: none"> - Danube port and terminal operators - Danube Port Network <p>Indirect beneficiaries:</p> <ul style="list-style-type: none"> - Logistics actors in connection with inland ports - Ministries responsible for transport - RSOE - ProDanube |
| <p>Timeline <i>Indicate the time horizon for the implementation of the action</i></p> | <p>2026: Project development and application for funding 2027: Technical design 2028-2029: Implementation, tests, evaluation 2030: Validation, introduction, exploitation and dissemination</p> |
| <p>Investment cost <i>How much will cost the construction/realization of the future initiative/action/technology?</i></p> | <p>4 000 000 - 10 000 000 EUR (total project budget, depending on number of partners and services)</p> |



| | |
|---|--|
| <p>Sources of financing <i>What are the sources of financing? Private capital, public capital, CEF, etc... How much is the share covered by each of them?</i></p> | <p>Connecting Europe Facility 2</p> |
| <p>Impact of the initiative <i>Describe the expected future economic, social, environmental impacts of this initiative</i></p> | <p>Economic The increase of efficiency and modernisation of procedures will lead to significant cost and time saving for ports and logistics.</p> <p>Social Digitalisation of port processes will support everyday life of the people working in the port and logistics.</p> <p>Environmental Digitalisation of ports will contribute to a sustainable, greener port operation also.</p> |
| <p>KPIs <i>Please identify the KPI to be used for measuring the action's impact</i></p> | <p>KPI1: Number of new modern, digital port services implemented</p> <p>KPI2: Number of employees affected by digitalisation</p> <p>KPI3: Number of countries connected in new system</p> |



5. Conclusion

In the Action Plan five project ideas are analysed and detailed for strategic planning. Different budget and size of projects are envisioned to support the decision-makers to choose from the projects. Some of the project plans are already elaborated in detail, some of them are innovative ideas that need more efforts to be developed before realisation.

The following ideas are innovative but should be developed:

- Automatization, Industry 4.0 port solution pilot
- Port Blockchain pilot

The following project plans are prepared or will be developed in the near future:

- Enhancing port communication with road transport in KIR national system
- Masterplan and pilot for Danube Ports Information System

The last project idea is based on the results of the fourth project strongly:

- Danube Ports Information System implementation

The implementation of the projects is of course strongly depending on the funding opportunities, mostly based on European funding programmes and calls. Some of the project ideas are very clearly linked to a funding programme, some of them are still open.



6. Sources

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