



Pilot actions co-design and launch report – topic no. 1 - transport flow management and vehicle booking systems

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Introduction

Activity 2.1 is devoted to co-design, implement and evaluate the pilot action in topic no. 1: transport flow management and vehicle booking systems.

More specifically, group members (LP, PP3, PP6 and PP8) test in different sites complementary approaches on transport flow management and vehicle booking systems.

The improvement of the ICT system supporting the logistic processes is the emerging solution to allow an increase in traffic using the current infrastructures and more effective coordination of the processes. All participating partners in Topic 1 “Transport flow management and vehicle booking systems” are affected by long queues both inside and outside the terminal area, slowing down all daily operative activities and making unpredictable the times and unreliable the operative plans. This causes a significant extension of the waiting times for the trucks, raising the costs and the CO₂ emissions

The pilot actions and investments described in the next paragraphs aim at improving the smoothness and efficiency of the last mile operations in the involved ports by introducing innovative technologies.

All pilot actions and investments answer to urgent and verified needs in the ports, therefore their realization is planned to conclude in 2025.



Port Network Authority of the Eastern Adriatic Sea (LP)

Title: Installing VBS sensors to monitor trucks flows

In October 2022, the Port Network Authority of the Eastern Adriatic Sea activated the so-called pre-arrival notification procedure, whereby trucks can enter in the Port of Trieste only if their arrival has been pre-approved.

This procedure greatly improved the situation at port gates, reducing congestion and improving the fluidity on the city roads.

Yet, the system in place cannot measure exactly the length of the queues at the gates nor the time spent for a truck entering the port.

Additionally, in the framework of the MERIDIAN (CEF) and ACCESSMILE (Interreg Central Europe) projects the Port Network Authority of the Eastern Adriatic Sea will further improve the management of the road traffic by developing a slot booking system for inbound trucks and the pre-exit notification for outbound trucks.

Additional tools are necessary to measure these KPIs as to adapt the pre-arrival notification procedure to the changing circumstances, differentiating VBS policies for trucks transporting containers or other ITUs.

The pilot investment consists of the installation of approximately 21 sensors (laser scanners) to be installed at the gates and a few hundred meters before the entry in the ports of Trieste and Monfalcone, including photovoltaic panels necessary for their power supply, control units and software.

It will allow to differentiate port access policies according to the type of cargo (container or semi-trailer), eliminating bottlenecks at the port gates, thus improving the port-city interface at the same time its environmental impact.

The exact number of pieces of equipment will be decided with the other PPs in the co-design phase and according to the market conditions.



Port of Ravenna Authority (PP3)

TITLE: Vehicle booking system of the PCS

Pilot action consist in the upgrade of the existing PCS by the realization of a new Vehicle Booking System module. These improvements will permit to speed up the access of heavy vehicles to the terminal gates, anticipating controls on customs clearance, delivery order and availability of the goods, and reducing the congestions and the inefficiencies at the terminal.

The new module will be divided in three sub-modules:

- **Digitalization of delivery orders:** implementation of connectors through which the shipping lines can transmit the Delivery order only in digital format and of a mechanism of release to the truck driver of a PIN code to be used instead of the printed copy of the delivery order
- **Transport orders management:** management of the transport orders emitted by the forwarders using a GUI, the mobile app or the APIs with which ask to release or withdraw a specific good. The system anticipates and automates the controls related to customs clearance, delivery order, and the availability of the goods. If all three controls are positive, the transport order will be accepted. There will be a unique and standard interface for all the terminals and some messages for the data exchange between the PCS and the different TOSs.
- **Multimodal appointment management:** management of the appointment between a truck driver and the terminal concerning a specific transport order. The truck company using the GUI, the mobile app, or the APIs, will be able to communicate to the terminal which driver and vehicle are assigned to the transport order and when it will be done and the terminal must confirm or not the appointment and send the gate-in and gate-out for the closure of the process.



Port of Rijeka Authority (PP6)

TITLE: Mobile application for announcing the truck arrival

Port of Rijeka Authority will develop a mobile application for Android and iOS platforms.

The mobile application will enable users for announce the arrival and check the availability of cargo and through it, users would be divided into user roles.

The large transport companies would make an announcement for their drivers, and the drivers would only receive an appointment and a digital license on their mobile phone, while small transporters would make the arrival announcement themselves in a much easier way

With this approach, the system of notifying users about terminal activities and work dynamics will be improved.

Therefore, the mobile applications will allow monitoring of the traffic conditions at the entrances to the port and, if necessary, inform users accordingly.

This pilot action will allow a more efficient connection with shippers and logistics operators located in the rural/peripheral areas which are reached by trucks and smoother entry/exit procedures, with subsequent positive impact on the environment.



Port of Ploče Authority (PP8)

TITLE: Installing cameras for managing trucks with HAZMAT

Part of the traffic flows managed by the Port of Ploče includes trucks carrying dangerous goods (HAZMAT), with ensuing implications in port-city relations in terms of security, congestion and air quality.

Port of Ploče Authority needs to collect information regarding the containers carrying dangerous goods. These data are collected by the Port control centre officer. All containers have codes which are unique, and containers for dangerous goods have their own unique codes. By using special cameras this code can be collected and exchanged in the system on electronical way and paperless. Data collected will be exchanged to Port Community System (PCS) which present exchange system and is possible to exchange these data to other subsystems. PCS is integrated with the National Croatian maritime information system (CIMIS) to exchange data regarding the vessels. Based on the inputs from the CIMIS, role of the agents (ship, cargo) is declared. This has impact on the cargo manifest and cargo operation documents provided with vessel announcements to terminal operators and PCS provide and exchange these data through API to terminal operating systems. Cargo container codes has been delivered and exchanged. Collection of these codes on terminal must be paired and exchanged for dangerous goods back to National CIMIS system. This data must be paired with data delivered from cargo agents and can be exchange with other ports.

For collecting these data Port of Ploče Authority needs to upgrade PCS and Control access system which include CCTV subsystem and Technical security system with approx. 20 cameras and technical security system part for the analytics which have to be able to recognise codes of containers and other objects.

The investment of PP8 is structured in the actions detailed in the tables here below:



Action no. 1: Upgrade and development of the PCS - Development of the API services to exchange data with other systems; Testing and production of the system

<p>Description of action/measure</p>	<p>Upgrade and development of the PCS - Development of the API services to exchange data with other systems; Testing and production of the system</p>
<p>Description of the main steps for its implementation</p>	<p>As part of the upgrade of the existing module, functionalities that belong to the domain of the PCS system will be implemented. The basis of the upgrade of the existing module will be integration with the terminal operating systems of the terminal operator Adriatic Tank Terminals in the form of an exchange of messages about vehicle (tank) announcements. This integration will serve as standard for integration with other Terminal operating systems of terminal operators.</p> <p>Functionalities refer to the interaction of port authority, the forwarder with terminal operator in the parts of the process that include common data, to avoid multiple entries in heterogeneous IT systems and to enable the reuse of already entered data, and to provide stakeholders with a single interface to the greatest extent possible in current situation. This primarily refers to the creation of vehicle announcements and the refinement and synchronization of their data, for the purpose of using them to create the necessary supporting documents within the PCS system, such as permits, invoices and any other necessary documents in the process that contain common data. The existing business process and its logic, which was previously implemented for the needs of the remaining port areas, remains unchanged.</p>

Action no. 2: Upgrade and development of the Control access system, Analytics system - Development of the API services to exchange data with other systems. Testing and production of the system.

<p>Description of action/measure</p>	<p>Upgrade and development of the Control access system, Analytics system - Development of the API services to exchange data with other systems. Testing and production of the system.</p>
<p>Description of the main steps for its implementation</p>	<p>As part of the upgrade of the existing module, functionalities that belong to the domain of the PCS system will be implemented. The basis of the upgrade of the existing module will be integration with the terminal operating systems of the terminal operator Adriatic Tank Terminals in the form of an exchange of messages about vehicle (tank) announcements.</p>



	<p>This integration will serve as standard for integration with other Terminal operating systems of terminal operators.</p> <p>Functionalities refer to the interaction of port authority, the forwarder with terminal operator in the parts of the process that include common data, to avoid multiple entries in heterogeneous IT systems and to enable the reuse of already entered data, and to provide stakeholders with a single interface to the greatest extent possible in current situation. This primarily refers to the creation of vehicle announcements and the refinement and synchronization of their data, for the purpose of using them to create the necessary supporting documents within the PCS system, such as permits, invoices and any other necessary documents in the process that contain common data.</p> <p>The existing business process and its logic, which was previously implemented for the needs of the remaining port areas, remains unchanged.</p>
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<p>Action no. 3, 4 and 5: Purchase of the networking equipment for data exchange on terminal (wifi, IoT. Etc), Purchase and installation of the server for the CCTV Video management system and object analytics, Purchase and installation of approx. 20 smart recognition cameras with video management system licences for recognition of container codes,</p>	
<p>Description of action/measure</p>	<ul style="list-style-type: none"> • Purchase and installation of the server for the CCTV Video management system and object analytics. • Purchase and installation of approx. 20 smart recognition cameras with video management system licences for recognition of container codes • Purchase of the networking equipment for data exchange on terminal (wifi, IoT. Etc)
<p>Description of the main steps for its implementation</p>	<ul style="list-style-type: none"> • Functional specifications • Tender • Installation of the equipment • Integration with Enterprise service bus to exchange data to PCS • Testing • Production



Pilot action and investments time plan

Expected time plan for the implementation of the pilot action per partner:

LP – Port Network Authority of the Eastern Adriatic Sea	
Milestone	Date (MM/YYYY)
Launch of the tender	04/2025
Award of the tender	09/2025
Start of the activity	10/2025
End of the activity	11/2025

PP3 – Port of Ravenna Authority	
Milestone	Date (MM/YYYY)
Launch of the tender	12/2022 *
Award of the tender	12/2022 *
Start of the activity	12/2024
End of the activity	12/2025

* A framework contract for new functionalities of the PCS was signed before the project start

PP6 – Port of Rijeka Authority	
Milestone	Date (MM/YYYY)
Launch of the tender	05/2025
Award of the tender	08/2025
Start of the activity	08/2025
End of the activity	12/2025

PP8 – Port of Ploče Authority	
Milestone	Date (MM/YYYY)
Launch of the tender	05/2025
Award of the tender	08/2025
Start of the activity	08/2025
End of the activity	12/2025



Conclusions

The pilot actions and investments to be implemented by the LP, PP3, PP6 and PP8 in MILEPORT project aim to tackle the same issue – how to optimise the freight road flows to/from the respective ports – by applying different IT solutions and of advanced ICT technologies from different perspectives.

The interoperability of the new equipment with the existing Port Community Systems or available IT systems is a key aspect, able to ensure the efficiency and the smoothness of data processing. The exchange and integration of data between the several ports stakeholders involved in the last-mile operations, such as the Customs Agency, port operators or road operators guarantee a comprehensive optimization of the traffic flows and improved connections with the hinterlands, with benefits spread along the whole logistics chain.

The digitalization of entry/exit procedures also allows to reduce the environmental impacts of the maritime traffic through the optimization of trucks queuing, contributing to strengthen the efficiency of the maritime transport mode compared to alternative land-based routes.

Each partner suggested a list **KPIs** inherent to their specific pilot action and investment that will allow to measure their impact once they are completed.

LP – PORT NETWORK AUTHORITY OF THE EASTERN ADRIATIC SEA

- No. of vehicles identified by the IT equipment
- Typology of vehicles identified by the IT equipment

PP3 – PORT OF RAVENNA AUTHORITY

- Number of terminals connected to the system
- Number of Delivery orders received per month
- Number of transport orders completed per month
- Number of booked vehicles per month

PP6 – PORT OF RIJEKA AUTHORITY

- number of usage mobile application and received digital licence
- calculation of traffic flow efficiency = $(\text{Total Vehicles Passed} / \text{Ideal Max Capacity}) \times 100$
- increase or decrease transit time using digital license



PP8 – PORT OF PLOČE AUTHORITY

- detention of trucks at the port entrance and port exit
- processing and delivery of port warehouse documents
- custom processing
- detention of trucks in port area
- entrance terminal truck processing
- type of truck and cargo monitoring and management
- time of transaction processing.
- implementation of new traffic monitoring IT system as a baseline for achieving IT systems interoperability

