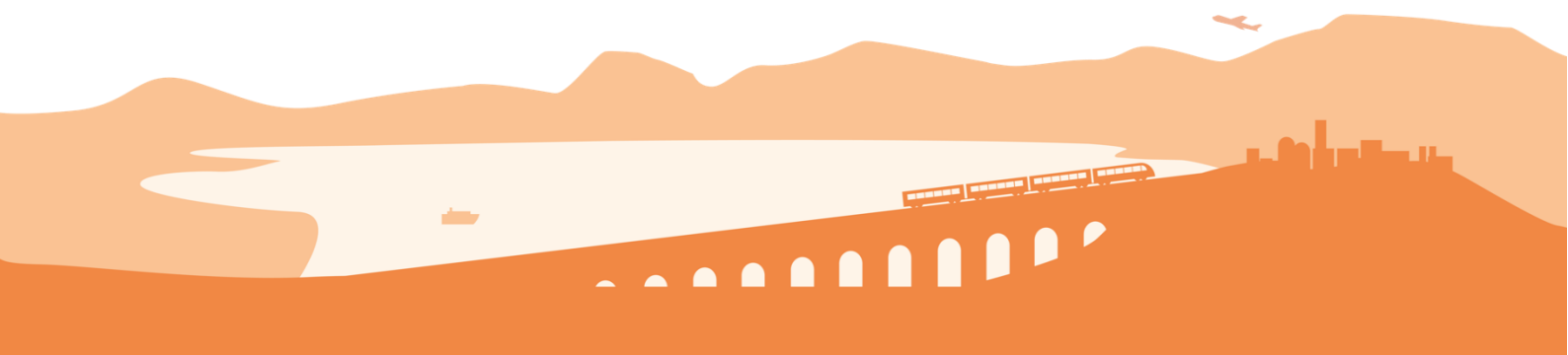
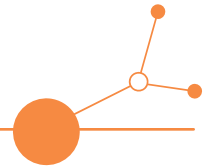


Pilot action final status report - topic 1

Deliverable no. D.2.1.3

Version 2

08 2026





Sommario

1. Introduction of the Pilot action	2
1.1. General Introduction	2
1.2. Importance of topic 1. in ports/terminals for peripheral and rural areas.....	2
2. Description of individual Pilot action of the participants of topic.1.....	4
2.1. LP - Port Network Authority of the Eastern Adriatic Sea.....	4
2.1.1. Ex Ante situation	4
2.1.2. Pilot action description	4
2.1.3. Pilot action results	10
2.2. PP05 - Port of Rijeka Authority	12
2.2.1. Ex Ante situation	12
2.2.2. Pilot action description	13
2.2.3. Pilot action results	18
2.3. PP07 - MAHART Container Center Ltd.	20
2.3.1. Ex Ante situation	20
2.3.2. Pilot action description	24
2.3.3. Pilot action results	25
3. Accessibility of rural and peripheral areas: results of the pilots	27
3.1. Port Network Authority of the Eastern Adriatic Sea	27
3.2. MAHART Container Center	28
3.3. Port of Rijeka Authority	30
4. Conclusions	32



1. Introduction of the Pilot action

1.1. General Introduction

Activity 2.1 is devoted to co-design, implement and evaluate pilot actions for improving the last mile accessibility of rural/peripheral areas to TEN-Ts through ICT. Within this activity, topic 1 is about transport flow management and vehicle booking systems, where there are three participating companies who design and implement their separate pilot actions, with a joint coordination, in order to make sure best exploitation of the project. After the implementation is done, the parties evaluate the pilot action, this is the aim of this document.

More specifically, in topic no. 1, the participating partners (LP - Port Network Authority of the Eastern Adriatic Sea, PP5 - Rijeka Port Authority and PP7 - MAHART Container Center Ltd.) tested in their different sites complementary approaches on improving the last mile accessibility of rural/peripheral areas to TEN-T network through ICT development, in the area of transport flow management and vehicle booking systems.

Participating partners suffer from the fluctuating transport flow by the trucks, and the big queues of these trucks at the port/terminal gates, which considerably slows down the entering and exiting processes of the sites.

The scope of the designed pilot actions is to leverage ICT development to better manage trucks' flow as to reduce the waiting time at port gates, so that rural and peripheral areas can be better and faster reached.

As a first step, the group members had set up the working group, developed the Action Plan and the Pilot Actions for each site to improve last mile accessibility of rural and peripheral areas through ICT, with improved transport flow management and vehicle booking system. Each site has different processes and systems used and faces different challenges, therefore, the Pilot Actions are different in their processes, while linked by the aimed results.

The aim of this document is to evaluate each Pilot action and find common results and learnings, consolidate the outcomes of the interventions and provide a common understanding of the positive impacts the Pilot Actions granted.

1.2. Importance of topic 1. in ports/terminals for peripheral and rural areas

The project ACCESSMILE aims to improve the last mile accessibility of Central European rural and peripheral areas to the main TEN-T freight nodes, strengthening territorial cohesion, through innovative IT solutions with the help of new planning tools, tested through joint pilot actions. The three key topics of ACCESSMILE are: 1) transport flow management and vehicle booking systems; 2) gates & entry/exit tools; 3) cargo bundling & tracking.

This report deals with the Topic no.1.: "transport flow management and vehicle booking system", where the participating partners are LP - Port Network Authority of the Eastern Adriatic Sea, PP5 - Rijeka Port Authority and PP7 - MAHART Container Center Ltd.

All the three PPs agreed that one of the main obstacles to reach faster entry/exit process of their logistic sites is the congestion at the gates, mainly due to the fluctuating transport flow and the existing entry/exit process. The arriving trucks usually have to wait hours before they can enter the port/terminal and being loaded with containers or exit from the port after their operations are concluded, this very slow process hinders to serve the rural and peripheral areas the same way as the other, closer, central destinations. The group members are convinced that with the help of ICT development, the trucks' flow can be better



managed and the waiting time spent at the gates of the port terminals can be considerably reduced, so that rural and peripheral areas can be better and faster reached.

The working group members defined a common Action Plan where after discussing on the most recent technologies and ICT solutions to reach the specific objective, each partner specified their own Pilot Actions to improve last mile accessibility or rural and peripheral areas through ICT - improved transport flow management and vehicle booking system, both with the help of ICT development, according with the solutions available and the different characteristics of their premises, procedures and ICT systems.

All the three parties were involved in implementation or improvement of a Vehicle Booking System (VBS), but, due to the different starting conditions and IT tools and processes, each site needed its own ICT solution; however, learnings and outcomes have been shared and discussed.

The importance of the topic one can be experienced and evaluated from several point of view. The queuing trucks contribute to CO2 emissions and increase the CO2 footprint of the container traffic. With reducing the waiting time, we increase environment protection with less fuel consumed and less CO2 emissions.

With reducing the waiting time, less trucks can perform the same trucking needs, also contributing to the environment protection. Last, but not least the terminal can support areas which are situated farther from the current radius, this is the reason that rural and peripheral areas can benefit from the pilot action, therefore these areas can be included into the environment friendly intermodal transport (rail and road), instead of full road transport.



2. Description of individual Pilot action of the participants of topic. 1.

2.1. LP - Port Network Authority of the Eastern Adriatic Sea

2.1.1. Ex Ante situation

Over the recent years, the **Port Network Authority of the Eastern Adriatic Sea (PNAEAS)** has invested in the digitalisation of the administrative procedures in order to better monitor and streamline transport processes in the ports of Trieste and Monfalcone. This occurred through the coordination with public entities - e.g. customs agency, maritime authority, police - and private operators - e.g. terminal and logistic operators, freight forwarders - also thanks to EU funds.

Port of Trieste already used some pre-arrival notification system, however, in this system arriving vehicles' arriving time could not be inserted, no slot-booking system is introduced, only the day of expected arrival.

The digitalisation of the last mile road accessibility of the ports of Trieste and Monfalcone, most notably to/from the peripheral and rural zones included in the ports' catchment areas, represented a key aspect to maximise the efficiency of port's logistics given the growing numbers of total throughput and the ensuing increased number of trucks.

In this context, implementing a pre-exit notification system for trucks is a strategic move to improve the last mile road accessibility of the ports of Trieste and Monfalcone.

2.1.2. Pilot action description

The pilot action envisaged the analysis and design of the application solution to be implemented for the digitalisation of the procedures for the notice and exit of goods by road from the port of Trieste, in order to automate the operations necessary for the affixing of the visa to leave the port.

The pilot action was developed jointly by the Customs and Monopolies Agency (ADM) and the Port Network Authority of the Eastern Adriatic Sea and had the following objectives:

- realisation of the prior notice of exit of goods from the port. The advance notice of arrival was realised within Sinfomar¹ in a new dedicated module and can be transmitted, through interoperability between ADM and PNAEAS, to the customs systems. The Advance Notice is completed by the control of vehicles at the exit gate from the port of Trieste;
- automation of the exit visa from the port by the Guardia di Finanza² (GdF).

The solution implemented is based on the re-engineering of the port exit procedures and the development of functionalities to simplify the procedures for checking vehicles and goods, in order to increase the security of these operations, allowing the automatic detection of abnormal behaviour.

The aims of this project, similarly to what has been achieved with the Pre-notification of Arrival procedure, are to optimise exit times from the port areas; automatically detect anomalies in the handling of goods; decongest the port areas; implement automated control of the exit visa; ensure customs and logistics

¹ <https://www.sinfomar.it/> The PCS Sinfomar is an IT tool for the management of vessel, vehicle and goods traffic in the port of Trieste and its Free Port.

² The Guardia di Finanza is a military Police Force reporting directly to the Minister of Economy and Finance, with general economic and financial crime-fighting competences



monitoring of goods flows. Moreover, since, in the case of the Free Points (Punti Franchi/PF), the logistic areas from which the goods leave are identified by the relative PF lot, through the exit notice it is possible to close all those lots of goods that have not been previously transformed into Transits or Imports, allowing a correct and definitive management of the lots themselves, and relative alignment with what is present in AIDA³.

By virtue of the particular regime of free port⁴, specific customs procedures were taken into account during the project phase. Specifically, with reference to the provisions of the service provisions of the Free Points of Trieste issued with the note prot. Nr. 709 dd. 12 January 2017 by the Customs Office of Trieste, art. 66, in the new procedure related to the Exit Notice the following data have been managed:

- Tractor plate, semi-trailer plate, container number;
- MRN of the declaration of entry for a customs procedure and PF number;
- Warehouse/depot/area/terminal from which the goods leave;
- Reference of the consignment of goods in the warehouse accounts;
- Manifest number, if available;
- Transport documents (CIM, CMR, DDT).

The main port stakeholders involved, directly or indirectly, in the project are as follows:

- Port Network Authority of the Eastern Adriatic Sea (PNAEAS);
- Customs and Monopolies Agency (ADM);
- Guardia di Finanza (GdF) - Port of Trieste;
- Freight Forwarder;
- Security at the gate;
- Haulier.

The company Infoera was responsible for implementing the 'Exit Notice' module within the Sinfomar PCS, the purpose of which is to enable the entry and management of logistical and customs data of the exit notice.

To enter the main page, after having entered the 'Traffic Alert Management' module in the Sinfomar PCS, the user must select Road Exit from the vertical menu.



Figure 1 - "Road Exit" icon

³ AIDA (Automazione Integrata Dogane ed Accise) is the information system created by the Italian Customs Administration to control complex customs operations.

⁴ The Free Port of Trieste regime is a special status that allows the port area to be considered outside the customs territory of the European Union, offering tax and customs benefits for goods transiting or exported through the port.



The main page presents a notice search mask where, aided by the filters present, it is possible to search for notices of interest.

Figure 2 - Main Page for the notice of interest

The module, therefore, provides for the interaction of Sinfomar PCS, either manually or in an automatic manner, with the management and logistics systems in use at the port terminal operators, in order to create the Exit Notice, which contains logistics data (with reference to the vehicle) and customs data (with reference to the goods) of the traffic leaving the Port of Trieste. This data is also integrated with data about the driver of the vehicle.

The exit notice (Figure 3) contains the following data:

- date of notice generation;
- terminal operator/agent/transporter/shipper/transit operator;
- tractor plate, trailer plate, ILU code, container abbreviation/number (if any), vehicle type, container type (if any), customs seal number;
- PF number;
- country of destination of the vehicle, mandatory if it has a transit permit;
- Warehouse/depot/terminal from which the goods leave;
- Driver data: first name, last name, nationality, document number, document type;
- Badge number issued by PNAEAS (if any).



PREAVVISO DI USCITA

PREAVVISO DI USCITA		
PORT TRACKING		IOT: P24QXL01WDO1PMNI N.Sinfomar: 6441278
<u>EXPECTED DEPARTURE DATE</u>		
TRACTOR PLATE		
TRAILER PLATE	34ED8713	
ILU CODE		
VEHICLE TYPE	Trailer	
CONTAINER No		
CONTAINER TYPE		
<u>BOOKING</u>		
ARRIVING BY	Road	
TERMINAL	SAMER SEAPORTS TERMINALS	
DESTINATION	Sinalunga	
DECLARANT	INTERLAND SRL	
HAULER		
SHIPPING AGENT	SAMER & CO SHIPPING SPA	
CUSTOMS BROKER	INTERLAND SRL	
HAULER		
TRAILER FIRM		
DRIVER SURNAME		
DRIVER NAME		
DRIVER NATIONALITY		
DRIVER DOCUMENT No		
DRIVER DOCUMENT TYPE		
<u>NOTE</u>		
VESSEL	TROY SEAWAYS	
VOYAGE	F.18210 / 46-24	
A2	2407264	
A2 MRN	24ITQXLA00664662M7	
DATA A2	12/12/2024	
PICKUP TERMINAL	SAMER SEAPORTS TERMINALS	
UNDG		
ADR		
IMO CLASS		
COMMODITY	ALTRE	
SEAL		
HS CODE		
GROSS WEIGHT	12956.00	
No. OF PACKAGES	8	
CUSTOM DOCUMENT	Formulario IM	
No. OF CARNET		
MRN	24ITQXL04EUA2407R4	

Created on 16/12/2024 at 14:32 - page 1 of 2



Autorità di Sistema Portuale
del Mare Adriatico Orientale
Porti di Trieste e Monfalcone

Figure 3 - Exit notice

The module provides for the composition and subsequent finalization of the Exit Notice by all operators involved in the logistics chain (terminal operator, agent, transporter, shipper, transit), tracking their individual contributions and respective responsibilities, in order to correct any typing errors, or to consciously make the necessary corrections in case of changed situations.

The Exit Notice is linked to the uniquely identified Sinfomar number and carries a barcode and QR code in order to enable faster reading by both the GdF and the supervisory service or similar entities.

The Exit Notice, realised as a new module Sinfomar Exit, allows the management of mainly logistics and customs data within the Sinfomar PCS. To complete the procedure, interoperability with the AIDA system was set up to allow the Exit Notice to be sent via Sinfomar to the customs systems and consequently make it visible to the GdF on the Port Tracking system, in use at the port entry points. It thus becomes possible to obtain the acknowledgement at the gate of the goods declared in the Advance Notice phase and the digitalisation of the exit visa procedure with the consequent memorisation of the information acquired in the exit visa phase.

The macro-activities implemented are briefly described below:

Acquisition on AIDA, System to System through interoperability, of the data of the Prior Notice of Exit of goods leaving the port received by the PNAEAS and sent by the operators. Among the data managed for the



Prior Notice, of particular relevance are the documents accompanying the goods on which the GdF staff affixes the exit visa at the gate: The MRN in the presence of specific customs declaration (e.g. Transit or Import) and related PF batch numbers and any reference documentation (e.g. Memorandum, LME, etc.).

PF number and relevant supporting documents in case the customs declaration is not available.

Other documentation in case neither specific customs declarations nor PF numbers are available.

Verification of the validity of the MRN declared in the prior notice, upon request of the PNAEAS during the compilation of the prior notice itself, by the economic operators.

Registration on AIDA archives of the data of the exit visas affixed at the port by the GdF and consequent sending of notification to Sinfomar (System To System through interoperability).

Interoperability with AIDA has the purpose of:

- Receive the Exit Notice information sent by the operators to the PNAEAS;
- Allow the validation of the MRNs declared in the Prior Notice already being compiled by the operators;
- Present the information of the Advance Notice to the GdF operators in order to facilitate the operations at the exit visa stage;
- Digitally record in AIDA the exit visa information recorded by GdF;
- Make the information on goods endorsed by GdF available to customs officials.

The implemented solution is based on the possibility of automatically detecting the exit notice number at the gate and presenting to the GdF operator on Port Tracking all information on the announced goods. The Exit Notice thus contains, as already specified in the previous section, a barcode and/or a QR code that can be read with an optical reader gun. The GdF operator equipped with a reader can then display the corresponding notice information on Port Tracking.

To best meet the requirements provided, a SOA (Service Oriented Architecture) with service logic was developed that will allow A2A (Administration - Administration) application cooperation between AdSP MAO and ADM.

The architecture supports the business processes described above and involves the three categories of users:

- Port System Authority;
- Customs Officer;
- GdF Officer.

The main services referred to in the development of the Exit Notice interoperability are the following:

- Ws_PSF: this service, active for the complete tracking of the vehicle within the port's customs area in case of import and export operations;
- WsPS_UM: this service, active for the tracking of the vehicle leaving the port's customs area.

Interoperability between Sinfomar and AIDA is through XML data exchange using the approach in line with what is currently provided for business processes.

Recalling the flow pattern, the company focused on the IT management of obtaining the IOT code and sending the exit notice data to customs.

The operations involved in the exit notice are:

1. the transIT creates the exit notice (PROVISIONAL);
2. the sendWsPsf service obtains the IOT code generated by AIDA;



3. the sendWsPsUm service sends the notice and any corrections to customs;
4. the GdF checks the vehicle that shows up at the port gate;
5. once the vehicle has been checked, the officer uses the Exit Acknowledge command present on PortTracking to authorize the exit of the vehicle from the gate; this operation invokes the PushEventService method.

See the flow diagram (Figure 4)

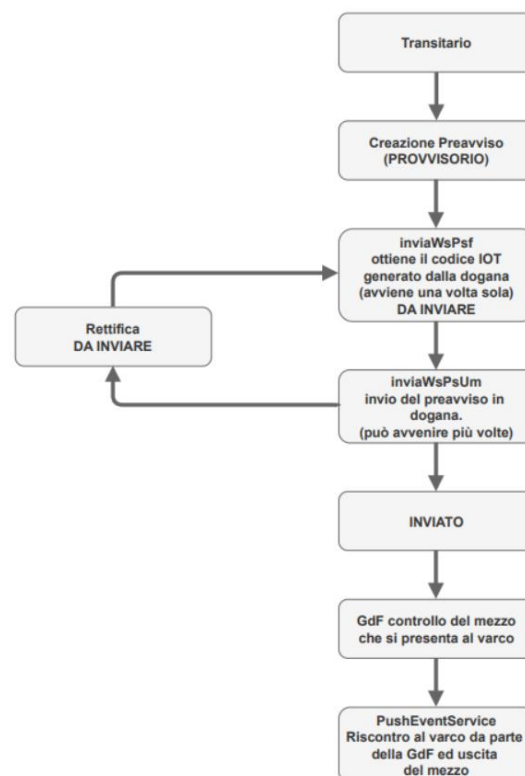


Figure 4 - Interoperability between Sinfomar and AIDA flow diagram

Thanks to the interoperability with AIDA, the Exit Notice made in Sinfomar is sent in AIDA and consequently visible to the GdF on the Port Tracking system, in use at the port gates. Thus, it becomes possible to obtain the acknowledgement at the gate of the goods declared in the Advance Notice phase and the digitization of the procedure of the visa exit from the port with the consequent storage of the information acquired in the process of affixing the visa exit.

On December 16, 2024, a first test took place at Varco 4 of the New Free Port of Trieste.

Both public and private actors present were:

- GdF;
- Eastern Adriatic Sea Port System Authority;
- Infoera;

And remotely connected: SOGEI, Customs and other personnel from GdF and Infoera.

The test resulted in the arrival of 5 pre-announced units on Sinfomar, 4 containers and 1 a Ro-Ro unit, transported by four different operators.



Relative to the vehicles that showed up at the port gate, the test was successful, the vehicles that showed up at the gate were found to have exited successfully.

The vehicles with license plate 34EB0761 and container MRKU0217962 did not show up by 7 p.m., the deadline for testing the exit notices. As a result, there is no exit acknowledgement for them from the GdF.

The exit notice related to vehicle license plate 34ED8713 that participated in the test is the one reported in Figure 3.

With reference to the interoperability between Sinfomar and AIDA, from the data collected during the field tests (Figure 5), it can be seen that:

- invocations of the WSPSF method always occur only once for obtaining the IOT ID;
- invocations of the WSPSUM method sometimes occur multiple times, this in conjunction with adjustments.

In addition, invocation of the method always involves sending the IOT ID provided by the previous method and the details of the transported goods.

SERVIZIO	MRN	COLLI	PESO LORDO	TARGA	CONTAINER	IOT ID	COD UFF DOG	ID CORRIDOR	ID DESTINAZIONE	ID NODO RILEVAZIONE	ROUTE	RISCONTR O USCITA
WSPSF				XA082FE	UETU5316360		IT129103		5	41 NAVE		1
WSPSUM	24ITQXL08ZL46750J3	710	6777.2	XA082FE	UETU5316360	P24QXL01ZDG1EFMI	IT129103		5	777 PFTRI02		2 OK
WSPSF					TLLU2313973		IT129103		5	41 NAVE		1
WSPSUM	24ITQXL04EPG2119R3	24	24480		TLLU2313973	P24QXL01PCKYQADF	IT129103		5	777 PFTRI02		2 OK
WSPSUM	24ITQXL04EPG2119R3	24	24480		TLLU2313973	P24QXL01PCKYQADF	IT129103		5	777 PFTRI02		2 OK
WSPSF				EMCU6132660			IT129103		5	41 NAVE		1
WSPSUM	24ITQXL04EOZ0510R0	10	8821	EMCU6132660		P24QXL01PDE1DI03	IT129103		5	777 PFTRI02		2 OK
WSPSF				TEMU6063090			IT129103		5	41 NAVE		1
WSPSUM	24ITQXL04EOX6974R1			TEMU6063090		P24QXL01ODS1VLTJ	IT129103		5	777 PFTRI02		2 OK
WSPSF				34ED8713			IT129103		5	41 NAVE		1
WSPSUM	24ITQXL04EUA2407R4	8	12956	34ED8713		P24QXL01WDO1PMNI	IT129103		5	777 PFTRI02		2 OK
WSPSF				34EB0761			IT129103		5	41 NAVE		1
WSPSUM	24ITQXL04ETZ6546R5	52	14776.95	34EB0761		P24QXL01IDH1MMBJ	IT129103		5	777 PFTRI02		2
WSPSF					MRKU0217962		IT129103		5	41 NAVE		1
WSPSUM	24ITQXL08ZL61309J9	60	277.76		MRKU0217962	P24QXL01ADL1KXE5	IT129103		5	777 PFTRI02		2
WSPSUM	24ITQXL08ZL61307J0	716	3722.64		MRKU0217962	P24QXL01ADL1KXE5	IT129103		5	777 PFTRI02		2

Figure 5 - Test data

2.1.3. Pilot action results

The Port of Trieste, a vital hub for maritime and logistical operations in the Mediterranean, plays a crucial role in regional and international trade. As global commerce increasingly leans toward digital solutions, modernizing port operations has become essential to enhance efficiency, safety, and compliance. In this context, the pre-exit notification system for trucks implemented revealed itself to be a strategic move that offered numerous benefits.

The following considerations arose from the monitoring of the gates and interaction with the main subject involved in the process, such as customs personnel, freight forwarders; security officers at the gate, hauliers, and PNAEAS personnel involved in the monitoring of the port roads and gates congestion.

Below, some of the activities positively affected by the pre-exit notification system implemented:

- Streamlining Operations through Digitalization

The core activity involved in this initiative was the analysis and design of an application solution aimed at digitalizing the procedures related to the notice and exit of goods by road from the port. Traditionally,



these procedures relied heavily on manual documentation and physical checks, often leading to delays, errors, and administrative burdens. By automating the process, currently, a digital pre-exit notification system enables real-time communication and reduces manual interventions, resulting in faster clearance times and smoother flow of trucks.

- **Enhancement of Efficiency and Throughput**

One of the primary advantages of a pre-exit notification system is the significant increase in operational efficiency. Trucks designated to leave the port can submit their exit notices electronically ahead of their departure, allowing port authorities to review and approve these notices more rapidly. This pre-emptive approach minimizes bottlenecks, reduces waiting times for trucks, and boosts overall throughput capacity at the port. Consequently, logistics companies benefit from predictable schedules and reduced costs associated with delays.

- **Improved Security and Compliance**

A digital pre-exit notice enhances port security by providing authorities with advance information about trucks departing with cargo. This proactive approach facilitates better monitoring, screening, and authorization procedures, thereby reducing risks associated with smuggling, unauthorized goods, or security threats. Moreover, it ensures compliance with customs and transportation regulations, which is crucial in a regulated environment such as port operations.

- **Facilitation of Data Collection and Analytics**

The digital system creates a valuable repository of departure data, which can be analysed to optimize port management strategies. Trends can be identified, bottlenecks addressed proactively, and resource allocation improved. The data-driven approach supports decision-making processes, leading to continuous operational improvements.

- **Environmental Benefits**

By reducing queuing times and streamlining exit procedures, the pre-exit notification system also contributes to environmental sustainability. Less idling and congestion lead to lower emissions of pollutants and greenhouse gases, aligning port operations with broader environmental objectives.

Thanks to all the above considerations, the implementation of the pre-exit notification system for trucks leaving the Port of Trieste represents a forward-looking innovation that delivers multiple benefits. It enhances operational efficiency, reinforces port security, simplifies compliance, and supports data-driven management. As global trade continues to evolve, such digital solutions are vital in maintaining the competitiveness and sustainability of port operations, ultimately supporting economic growth and logistical excellence in the region.

Going deeper into the **pilot action's results** for the last mile logistics to/from the peripheral and rural zones included in the ports' catchment areas, **5 main improvement field can be noticed/expected:**

Enhanced Traffic Flow and Reduced Congestion

Fewer Trucks Waiting: By automating and streamlining departure procedures, trucks can leave the port more promptly, reducing congestion on port access roads and surrounding infrastructure.

Less Road Congestion: Improved efficiency means fewer trucks idling or queuing in the region's road network, alleviating traffic jams that often extend into city centers and regional highways.

Increased Reliability and Predictability

Consistent Schedules: With real-time notifications, logistics providers can better plan their routes and timings, leading to a more predictable flow of goods in the last mile.



Improved Delivery Times: Better scheduling reduces delays in deliveries to regional distribution centers and customers, which enhances service quality and customer satisfaction.

Cost Savings and Efficiency Gains

Reduced Fuel Consumption: Quicker departures and fewer stoppages lead to significant fuel savings for logistics companies.

Lower Operational Costs: Less idling and quicker turnaround times decrease overall transportation costs, benefiting regional economic activities.

Environmental Improvements

Lower Emissions in the Region: Reduced idling and congestion translate into decreased local air pollution, improving air quality around urban and suburban areas.

Health Benefits: Better air quality contributes to public health, reducing respiratory and cardiovascular issues linked to air pollution.

Support for Sustainable Regional Development

Reduced Environmental Footprint: As transport efficiency improves, the region's overall carbon footprint declines, aligning with sustainability goals.

Enhanced Competitiveness: The port's modernized operations make the region more attractive to logistics and industrial companies seeking efficient and environmentally conscious supply chains.

In essence, digital pre-exit notification enhances last mile logistics by improving traffic flow, reducing congestion, and lowering emissions in regional areas. These improvements lead to more reliable delivery schedules, cost savings for logistics operators, and a positive impact on regional air quality and public health. As a result, the local economy benefits from more sustainable and efficient freight movement, fostering a resilient regional logistics network.

2.2. PP05 - Port of Rijeka Authority

2.2.1. Ex Ante situation

The Port Authority of Rijeka currently provides ID cards to its users as port entry permits: these cards can only be collected at the Port Authority offices during the prescribed working hours. Due to this port entry authorization method, a long time is needed to enter into the operational area of the port, with additional costs, traffic jams on the access roads, and consequent pollution on the surrounding areas.

Before the current implementation of the pilot project, the port authority improved the existing design and introduced new steps to facilitate the entrance to the port area through ICT:

1. Application submission

Users submit their permit application through the Portunus system as before. New requirements will include mandatory submission of photos of the user.

2. Permit approval

Once the port authority, police and concessionaire approve the permit, a virtual permit is created.

3. API integration

It is necessary to publish and analyze the API for connecting the new virtual card issuance system with Portunus and ACT. Currently, the permit is automatically created in ACT.



4. Card management

Portunus must allow users to view all cards in their possession, as well as the ability to extend and cancel cards.

5. Card Issuance Regulations

Create a proposal for amending the Card Issuance Regulations.

6. New Reader Analysis

Perform an analysis of the number of readers needed, noting that all those installed so far support NFC technology. Plan a minimum of 4 readers at each entrance: two for people and two for vehicles.

7. User instructions

Create detailed instructions for users on how to use virtual cards.

8. System architecture

Work out the details of the system architecture, including:

- Online architecture (all data goes through the server)
- Offline architecture (the card is activated via Bluetooth)

9. Virtual permit design

Create a design for the appearance of the virtual permit and the QR code on the card.

10. Migration of existing cards

Develop in detail the method of migrating existing cards to the new system.

11. Vehicle cards

Develop the issuance of vehicle cards. Daily cards can be virtual, while others cannot.

12. Double check for vehicles

Investigate the possibility of double check for vehicles (e.g. card and LPR - License Plate Recognition).

13. System block diagram

Create a system block diagram and proposal for reader positions.

The virtualization of ID cards represented a step forward in the modernization of the port access permit system.

ACCESSMILE will enable a greater efficiency, security and simplicity of the system thanks to the implementation of new technologies such as NFC and Bluetooth that will ensure the flexibility and robustness of the system.

2.2.2. Pilot action description

As described in the previous chapter, the Port of Rijeka has implemented an advanced IT platform known as Portunus, which serves as a central digital interface through which users can request access to specific port areas. This system represents a significant step forward in the digitalization of port operations, enabling smoother administrative procedures and improved coordination between port stakeholders. However, with the continuous growth of traffic and logistics operations in the port and its hinterland, the need has arisen to further enhance Portunus with additional digital functionalities to better serve a wider range of users, particularly those operating in rural and peripheral areas connected to the port's logistics network.



To address these needs, the Port of Rijeka Authority, within the framework of the ACCESSMILE project, initiated an upgrade of the existing platform by introducing a new digital access management system. This system allows port users to obtain and use a complete digital identity card or electronic permit for entering the port area. The new functionality is supported by the development of a custom-made mobile application that seamlessly integrates with the Portunus IT platform. Through this mobile solution, users can manage access requests, receive approvals, and validate their entry credentials directly from their smartphones, ensuring a convenient and fully digital experience.

In parallel with the software upgrade, 16 new multi-technology readers are being installed at the port's access points. These devices—equipped with RFID, NFC, and Bluetooth® technologies, as well as touch screens, keypads, and QR code/barcode scanning modules—will enable the use of various forms of digital identification. The introduction of these readers will allow for faster verification of access permits, reduce waiting times at entry gates, and provide a flexible and secure access control system compatible with multiple identification technologies.

The new infrastructure will be deployed across the Rijeka Basin and the Raša Basin, ensuring consistent digital access control across all major operational areas of the port. By simplifying and accelerating the entry and exit procedures, this upgrade will contribute to a more efficient flow of goods and vehicles, reducing administrative bottlenecks and minimizing congestion both at the port gates and on adjacent city streets leading to the terminals.

Beyond operational efficiency, the pilot action also carries significant environmental and economic benefits. By optimizing the movement of vehicles and reducing idle times, the system is expected to lower fuel consumption and emissions, contributing to the port's broader sustainability goals. Additionally, improved coordination with shippers, freight forwarders, and logistics operators located in the hinterland will enhance the overall integration of the port into regional transport networks, facilitating smoother multimodal connections.

This ongoing pilot action represents an important milestone in the Port of Rijeka's transition toward a fully digital and smart port environment. It strengthens the port's competitiveness within the Adriatic and Mediterranean logistics corridors, supports the principles of the EU Smart Mobility strategy, and sets an example of how digital transformation can drive both operational efficiency and environmental responsibility in port management.

The Port of Rijeka Authority has launched a pilot project to modernize the access control system for port operational areas, using new virtual access control cards. This project aims to improve the security and efficiency of operations in the port. The pilot project has proven that the new virtual cards can: Increase the level of security, Reduce the time required for the card issuance process, Reduce electronic waste by removing old cards from use, Speed up the process of accessing goods and cargo in the port area.

This solution will also have a positive impact on the optimization of daily operations and sustainability, reducing the amount of electronic waste and facilitating operations within the port.

As part of the pilot project, The Port of Rijeka Authority carried out :

- Installation of hybrid contactless card reader 16 pieces

By locations:

- Žabica 4 pieces (entrance bus station)
- Brajdica Service entrance 2 pieces (Container Terminal Brajdica)
- Brajdica Main entrance 8 pieces (Container Terminal Brajdica)
- Temporary entrance road D403 2 pieces



- installation of a time and attendance terminal PRA main building
- installation of a contactless card reader PRA main building

Total: 7 pieces

- o By locations: PRA main building
- o Entrance Parking Mail building
- o Ground floor 3 pieces
- o And Floor 2 pieces

In addition to the installation of equipment the following steps have been made:

- Survey of the current system situation and creation of an application and API development plan
- Installation New computer with 24" monitor
- Supply 1000 virtual cards
- Development/customization of a mobile application for virtual cards for Android and Apple devices,
- Development/customization of a cloud/server platform for secure distribution of virtual cards
- Development/customization of an interface for communication between the Portunus, ACTPro services and the virtual card distribution system
- Creation of user instructions
- Creation of supporting documentation
- System maintenance









Figure 6 - Equipment installed in the port of Rijeka

2.2.3. Pilot action results

By the end of August Port Authority of Rijeka was able to complete its pilot action. There was, however, a small delay with the results and providing real feedback due to external factors: the intense and challenging period of investments and development of the port operational area required to coordinate the realization of several projects that are directly or indirectly connected with the implementation of this pilot project.

These projects include:

- Reconstruction of the Žabica entry-exit point
- Relocation and construction of the D403 entry-exit point
- Implementation of access control in the new ISPS area of the new container terminal Zagrebačka obala

Reconstruction of the Žabica entry-exit point

The completion of the project for the arrangement of the Rijeka basin surface and obtaining the usage permit created the prerequisite for the reconstruction of the Žabica entry-exit point. The technical inspection of the mentioned project was planned for September 2024, but due to delays in the completion of works, it was carried out at the end of last year.

The contract was signed on January 30, 2025, and the completion of the realization was expected on May 2025. After the completion of construction, electrical installation, and locksmith works, the installation of the equipment for video surveillance and access control began.

Since the virtualization of cards is related to the installation of multi readers, only after the installation of the access control gate, the installation of the necessary multi readers began.



Figure 7 - Žabica entry-exit point



Figure 8 - Žabica entry-exit point

Relocation and construction of the D403 entry-exit point

The construction project began with the signing of the contract on January 23, 2025.

After the completion of construction, electrical installation, and locksmith works, the installation of the equipment for video surveillance and access control was implemented. Since the virtualization of cards is related to the installation of multi readers, only after the installation of the access control gate, the installation of the necessary multi readers began and was finalized.

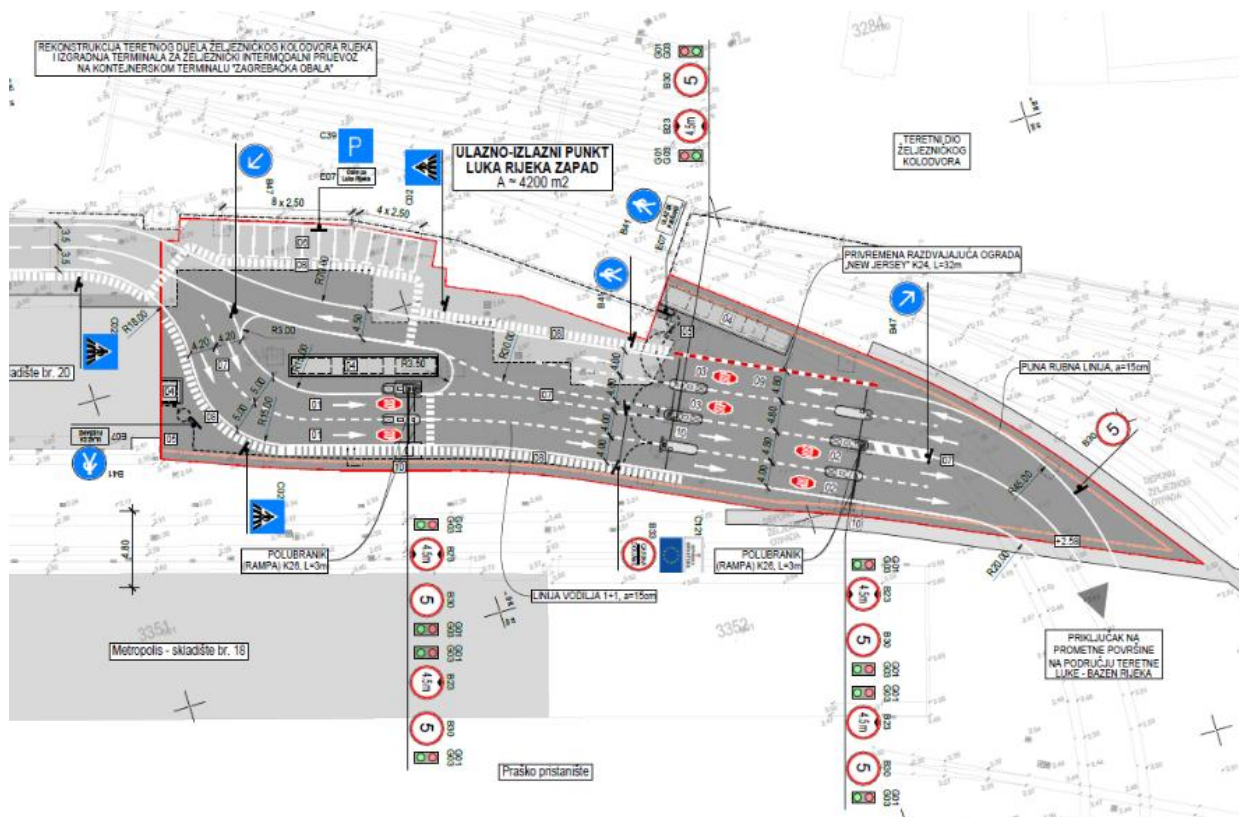


Figure 9 - D403 entry-exit point project design

Implementation of access control in the new ISPS area of the new container terminal Zagrebačka obala

Currently, one of the largest historical projects of the Port Authority of Rijeka is ongoing with the scope to equip and prepare the start of the operations of the new container terminal Zagrebačka obala. A very challenging series of activities needs to be precisely coordinated from all aspects, especially from the aspect of security.

Since the container terminal Zagrebačka obala has high standards regarding security, it was necessary to harmonize the technology and level of security encryption of the multi readers funded by the ACCESSMILE project as the same readers will be installed by the concessionaire at their entry-exit points.

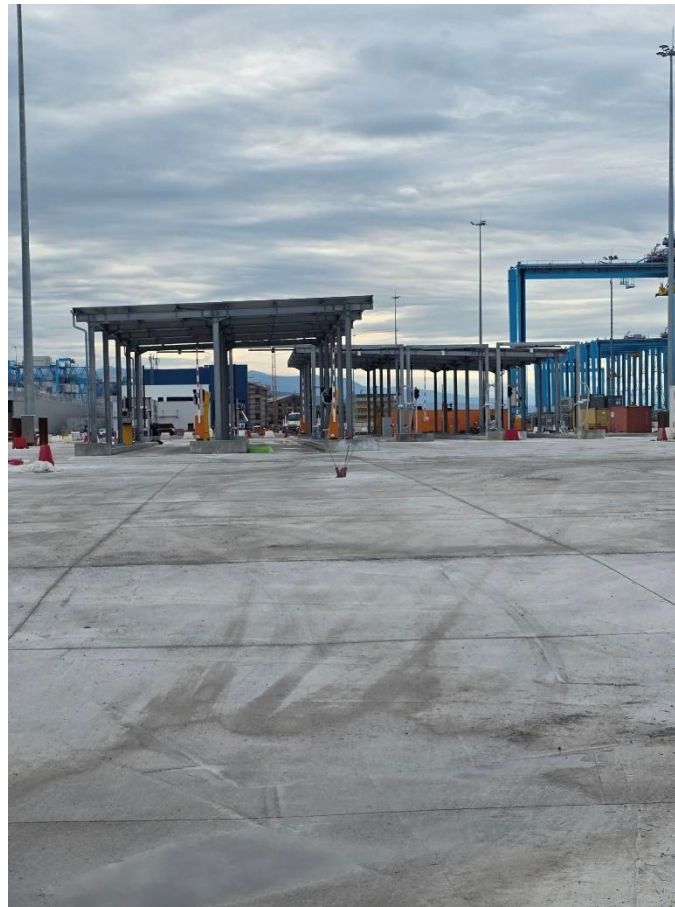


Figure 10 – works for the realization of the access control in the new ISPS area of the new container terminal

These three projects are crucial for the modernization of the port operational area and represent a significant step forward in ensuring a safe and efficient port.

The implementation of the pilot action funded by ACCESSMILE project related to the ID card virtualization system along with its mobile application will enable simpler and faster access management, which will ultimately increase the security and efficiency of operations in the port of Rijeka.

Due to the reasons described here above, the Port of Rijeka Authority successfully finalised its investment in August 2025. With implementation of the projects accessibility of rural and peripheral areas to the port will be improved, with the development of the IT systems, digitalisation, more readers, the entry process will be more efficient, trucks spend less time at the entry gates, with the help of the bar code, the driver can remotely check in with a help of an app.

2.3. PP07 - MAHART Container Center Ltd.

2.3.1. Ex Ante situation

One of the problems affecting the logistic supply services to rural and peripheral areas, concerns the driving time allowed for the truck drivers. The daily driving time cannot exceed 9 hours (2 times a week can be extended to 10 hours) and after 4 and a half driving hours a minimum of 45 minutes break must be taken. Usual rest time should be minimum 11 hours a day (can be reduced to 9 hours 3 times a week).



The driving time of a truck from MAHART Container Center's site in Budapest to rural and peripheral areas is normally from 3 to 4 hours (3-3,5 hours to Zalaegerszeg, Szombathely, Szeged, Békéscsaba, Debrecen, Nyíregyháza area and 4-4,5 hours to Záhony via different motorways); if we consider an average of 2 hours for the unloading operations, a truck can turn back from a rural area within 8-9 hours).

Taking into consideration that during the container handling activities at the MCC terminal the truck slowly moves forward in the queue and the tachograph cannot be switched off, the driver is considered as working/driving, also while waiting to be loaded. Therefore, this period cannot be considered as rest time. Currently there are working peaks when there are up to 80-100 trucks that are waiting for entering or waiting for handling at MCC terminal, with an average 4-5 hours waiting time (when the truck slowly moves and stops). Therefore, due to this congestion, a destination at a rural and peripheral area cannot be served within one day by truck with one driver only. This affects the rural and peripheral area with a competitive disadvantage compared to closer, central and more developed areas.

In order to improve the last mile accessibility of MCC's rural/peripheral areas, trucks turn time must be reduced by an average 1 hour.

MCC has several plans to speed up the turn time, including the modification of entry and exit lanes to the terminal (this action is outside ACCESSMILE project), improve the control of truck flows with an IT tool for the Vehicle Booking Systems / pre-arrival or pre-exit notification, as well as innovative terminal gates and a full interoperability with IT systems.

Another issue to be solved is the administrative procedure for checking the containers at the MCC's gate.

When, finally, the truck reaches the entrance of the terminal, the container is checked and a receipt report has to be filled-up manually on paper, then the report is forwarded to the customer service, who type in the container receipt report into the system.

This manual system slows down the entering processes and increases the possibility for human errors in typing data into the system.

This slow process could be considerably speeded up, by using ICT developments in a way that the examiner with the help of a handheld OCR equipment, can make the report - including pictures - and can automatically upload the report into the system. This gives an improved and faster process at the terminal gate.

Within ACCESSMILE project, MCC promoted a pilot action with the following scopes:

- Development of an ICT system for portable OCR scanning of incoming trucks to speed up the procedure of checking inbound trucks;
- Development of an ICT vehicle booking system and a truck calling system at the terminal;
- A new truck parking area, equipped with displays, to fulfil the needs of the truck calling system.

The processes for receiving and departing trucks were mainly manual and slow. With 4 hours turn time at the terminal plus 2 x 3-4 hours driving time, plus 2 more hours for container unloading, a truck cannot serve the rural and peripheral areas in case of one driver, as one driver can work 9 (max 10) hours daily. So, there was a need to reduce the truck turn time to one hour (or below), in order to make it possible that a container can return in the same day from the rural and peripheral area to the terminal.

In order to reach this goal, MCC has to improve and strengthen the processes and ICT, by developing vehicle booking systems with pre-arrival or pre-exit notifications, as well as terminal gates and interoperability.

Demand for intermodal transport is constantly increasing and this increase is expected to continue in the future. EU policy of promoting environmentally friendly modes of transport (rail, water) and switching traffic from road to rail and water also supports this progress. The terminal supply side could keep satisfactory capacities for the volume growth and such capacity increase should come from efficiency improvements.



With optimised processes, the truck throughput can grow and also the competitive disadvantage of the rural and peripheral area can be eliminated.

2.3.2. Pilot action description

In MAHART Container Center, due to fluctuating trucks' arrival, at some days of the week and some hours of a day there were huge congestions for entering the port, while other times the entrance was almost empty. The majority of the trucks usually comes in the morning and afternoon hours, while other periods (late morning, early afternoon and evening/night) there are very few trucks coming.

The MCCs Pilot Action is about tackling this problem, by implementing a Vehicle Booking System, a Truck Call-in System and an OCR container/truck checking software.

The trucks had no dedicated parking place for waiting for entering the terminal, but they were standing in a queue, in the sequence of arrival at a certain place of the logistics center, there was no possibility to call in the most important trucks, and the trucks could not arrive on a pre-booked slot, as this process did not exist. MAHART Container Center did not have a slot booking system, therefore arrival time of a truck could not be managed or anticipated, the trucks arrived whenever they wanted, this created a huge fluctuation of trucks' arrival times. While there was a huge congestion in the morning hours, by noon the arrivals are reduced, thereafter also a peak during afternoon.

Due to this process, the trucks had to wait several hours before entering the port, making it impossible to reach rural and peripheral areas by truck in one day. In order to solve this problem, and promote the last mile access of rural and peripheral areas, PP07 implemented several measures to optimise transport flow and truck entering process.

In order to avoid queue of vehicles, MCC rented a dedicated parking area - for up to 60 trucks - in the logistic Centre from Budapest Free Port, where the arriving trucks must check in. The trucks are called in to the terminal from this designated parking area, with the help of monitors and barrier system. PP07 also implemented a Vehicle Booking System, giving the possibility to the customers truck drivers to book trucks arrival for a time slot. This is not obligatory, but who has booked a slot has priority and is served earlier. In the system MCC offers number of loading/unloading lots in a particular time which can be pre-booked, therefore, no congestion will be created by overbooking a particular time slot.

When the trucks finally are called in and arrive at the terminal gate, the containers and the trucks are be checked with the help of a handheld OCR reading system, which enables automatic uploading possibility to the terminal software (TOS - Terminal Operating Software), this enables further fastening of the entry process and less human errors, compared to the manual work.

In case the trucks that arrive for containers to be carried to rural and peripheral areas can book a loading slot which enables them to arrive at the destination at the required time and the same driver can implement the round trip (transport to destination, unloading and bringing the empty container back to drop off) within the allowed driving time of 9 (maximum 10 hours).

The problem with supplying the rural and peripheral areas are with the driving time possibilities of the truck drivers. The daily driving time cannot exceed daily 9 hours (weekly twice can be extended to 10 hours) and after 4 and a half hour drive a minimum of 45 minutes break must be taken. Usual rest time should be minimum 11 hours a day (can be reduced to 9 hours 3 times a week).

Several re-arrangements (increase the number of lanes, new parking place) are also to be developed by MCC own budget, while the ICT Pilot Action development (VBS, truck call-in system, OCR system) and some equipment (display monitors) were co-financed by ACCESSMILE budget



Therefore, with pre-announcement of the trucks through a newly developed VBS solution and calling-in system from the buffer area, as well as better transport and gate-in management (OCR solution for vehicle and container checking) the trucks entry procedure can be considerably faster and rural and peripheral area can be served better and quicker.

The intermodal volumes are increasing year by year in Hungary and the terminals are at the edge of the operational capacities. The demand is fluctuating and at the peaks it already creates difficulties of the terminals both on the rail and the truck side.

MCC in the past made a lot of efforts already to ease this congestion from the rail side, by improving ICT on the rail side with and OCR gate and automatic EDI data exchange with other terminals/ports. in this way the train turn time shortened, train handling capacities increased.

Now, with the help of ACCESSMILE project, PP07 concentrates on improvement in the road side, extending parking place territories, by improving the truck gate-in processes with new IT developments as described above.

Figure 11 - Screenshot of the slot booking system

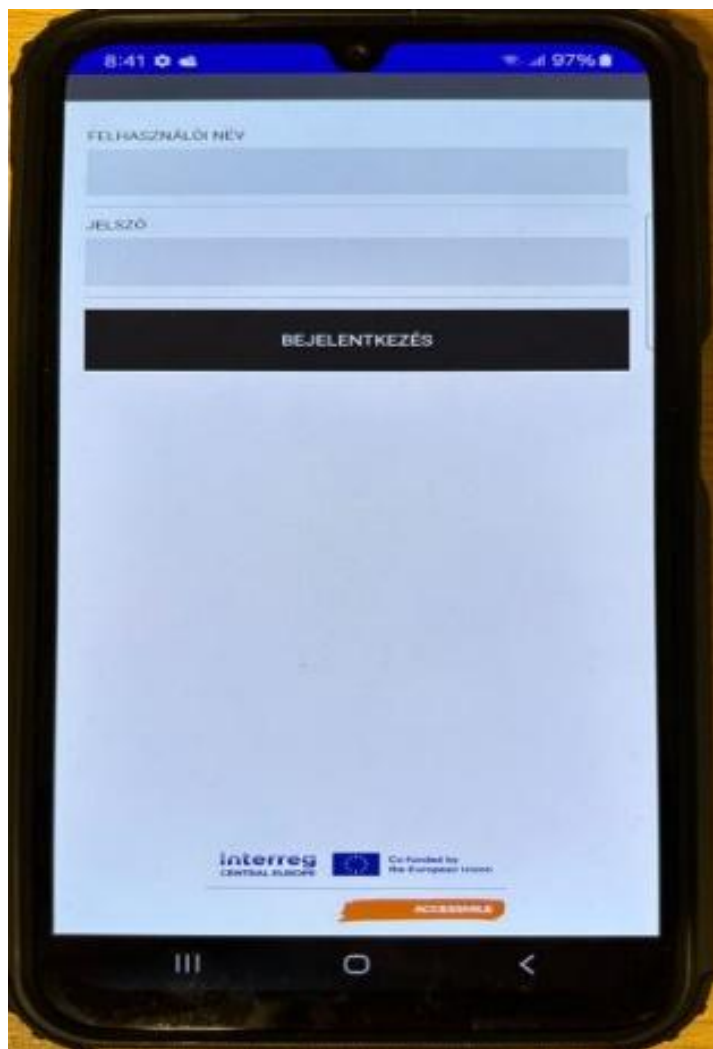


Figure 13 - Screenshot of the slot booking system app



Figure 12 - Test mode of the display



Figure 14 - Test mode of the display

2.3.3. Pilot action results

MCC has accomplished the IT development side of the project in time, as originally planned, by September - November 2024. There was only one delay, the landlord of the logistics centre (BSZL - Budapest Free Port) handed over the new parking area in February to MCC, as BSZL had to have an agreement with the previous tenant - who rented the place before - they had to be moved out from the area. After taking over the new parking place, MCC had to rearrange the site and put gate and toilet containers, laid down necessary optical cables, rearranged the moving plan and erected posts on which the two displays are positioned.

The parts of the IT development were independent from the parking place and the OCR automatic entry system was implemented Q3 last year and the VBS and the call-in system were tested that time.

The rearrangement of the parking area was finished in April therefore the whole new processes, like the vehicle booking system (VBS) and the call-in system was ready to start according to the timetable of project ACCESSMILE. By the end of April the live test period could start and already could show huge improvement compared to the previous processes.

The IT development company was selected through a public procurement tender process, this was an open tender, published in EKR system (the official and central system of public procurement system in Hungary). The tender was successful, without legal procedures, therefore the contract could be signed on 13th June, 2024. The software development was fully finalised, after the testing protocol the development with the source code was handed over to MCC, and the "certificate of completion" was also issued.

The supplier of the displays - due to the fact that the budgeted amount did not reach the level of the public purchase process limit - was selected by an invitational normal tender process. After agreement on the specification a wide internet search was made, based on what the potential suppliers were selected and invited to the tender. The process was successful and the 2 big open-air displays were delivered by the end of last year.

After the parking place was taken over and the necessary arrangements done, apart from the already working mobile OCR system, the VBS and the truck call-in system could also start. Now we have a live test period, but also can feel the less congested entrance and the better processes that were developed with the help of ACCESSMILE budget.

There were some KPIs defined during the project, these can be measured after a few weeks/months of operation, however, the trucks' turn time have been noticeably shortened. The trucking companies and the truck drivers already showed their satisfaction on the new process, the trucks are waiting in a parking place that is designed for this reason, with much better conditions, for example a container toilet is available for



the drivers. The waiting time has been reduced and now the process is clear, those trucks can proceed to the terminal entrance whose register plane number is visible on the display screen.

The VBS (vehicle booking system) is not used by all the truck drivers, however, as the trucks that use VBS before arrival have priority over the trucks who arrive without preliminary notification, in short time frame we are confident that the majority of the trucks will use the opportunity to book an arrival slot through the newly developed VBS system.

With the help of the ICT developments supported by ACCECCMILE project, the handheld OCR system at the terminal entrance, the vehicle booking system and the truck call-in system, the fluctuation of the trucks arrival can be reduced, the waiting time of the trucks can be reduced and the terminal entrance process could be fastened.

All these factors contribute to more efficient truck handling and with reducing the trucks turn time, this became a reality that the rural and peripheral areas can be served within one day, even if there is one driver in the truck, so the competitive disadvantage of the rural and peripheral areas could be eliminated with the support of ACCESSMILE project.



3. Accessibility of rural and peripheral areas: results of the pilots

Each pilot was designed to address the challenge of improving last-mile accessibility in rural and peripheral areas, starting with the specific baseline characteristics and systems in use at each site.

The pilot implemented by the Port Network Authority of the Eastern Adriatic Sea and the one implemented by MAHART Container Center have been evaluated from the monitoring of the gates and interaction with the main subject involved in the process, such as customs personnel, freight forwarders; security officers at the gate, hauliers, and personnel involved in the monitoring of the port roads and gates congestion, on the 6 main aspects impacted by the actions.

- Technological Advancement and Digitalization
- Safety and Security
- Port and Terminal Operations and Management
- Customer Service and Satisfaction
- Environment and Sustainability
- Social and community responsiveness

Since the pilot action promoted by the Port of Rijeka Authority is not finished yet, we provide below an estimation on its effects on the identified aspects. Once the Port of Rijeka Authority will finalise its action, this deliverable will be integrated with the outcomes of the pilot action implemented

3.1. Port Network Authority of the Eastern Adriatic Sea

Referring to the pilot action developed by the Port of Trieste, the following table highlights the evaluations on the impact of the Pre-Exit Notification System for Trucks in the Port of Trieste, with specific attention to its effect on accessibility to rural and peripheral areas. The scores reflect the typical challenges and improvements expected in a port like Trieste, an important logistics hub with connections to Central and Eastern Europe, and the often-limited infrastructure in surrounding rural regions.

Aspect	Pre Status (1-10)	Post Status (1-10)	Comments/Observations
Technological Advancement and Digitalization	5	8	Trieste benefits from modernization; pre-exit alerts integrate with digital logistics systems.
Safety and Security	6	9	Better scheduling and vehicle tracking reduce unauthorized movements and enhance roadside safety.
Port and Terminal Operations and Management	5	9	Streamlined truck exit flow helps avoid bottlenecks, especially at peripheral road junctions.
Customer Service and Satisfaction	6	8	Transport companies and rural consignees experience better predictability and fewer delays.
Environment and Sustainability	4	7	Less idle time and smoother logistics flow reduce fuel consumption and emissions in rural transit corridors.



Aspect	Pre Status (1-10)	Post Status (1-10)	Comments/Observations
Social and Community Responsiveness	5	8	Reduced truck build-up improves livability and road access in peripheral towns and villages near the port.

3.2. MAHART Container Center

Based on the technologies and infrastructure upgrades implemented at the MAHART Container Center, including:

- Vehicles Booking System (VBS)
- Trucks Call-in System from buffer area/truck parking lot with display monitors
- OCR (Optical Character Recognition) Gate

the following table collects the evaluations of the pre and post impact, with a particular focus on accessibility to rural and peripheral areas.

Aspect	Pre Status (1-10)	Post Status (1-10)	Comments/Observations
Technological Advancement and Digitalization	4	9	Integration of VBS and OCR gates introduces automation, real-time data exchange, and smarter logistics flows.
Safety and Security	5	8	OCR and call-in systems reduce unauthorized entries/exits; predictable schedules reduce roadside risks.
Port and Terminal Operations and Management	5	9	Booking and call-in systems reduce congestion; parking lot monitors enhance staging and flow control.
Customer Service and Satisfaction	5	8	Carriers and clients benefit from reduced waiting times, real-time updates, and faster gate processing.
Environment and Sustainability	4	7	Reduced idle time and waiting queues mean lower emissions; better logistics reduces traffic through small towns.
Social and Community Responsiveness	5	8	Local rural roads benefit from controlled dispatching and parking systems, reducing traffic shocks and delays.

3.3. Port of Rijeka Authority

After the pilot action has been finalized by the Port of Rijeka Authority, the following table highlights the estimation of the pre and post status across key logistics and social-environmental dimensions, with a particular focus on the accessibility of rural and peripheral areas, based on the impacts of the digitalization of the port entry permit system and the installation of multi-readers at the port's gates.



Aspect	Pre Status (1-10)	Post Status (1-10)	Comments/Observations
Technological Advancement and Digitalization	4	8	Digital permits and multi-readers automate access, reduce manual checks, and enable data centralization.
Safety and Security	5	8	Automated entry validation reduces risk of unauthorized access and improves gate surveillance.
Port and Terminal Operations and Management	5	8	Faster entry processing improves gate flow and reduces queue lengths and turnaround time.
Customer Service and Satisfaction	6	8	Drivers and transport companies benefit from fewer delays and less bureaucracy at entry.
Environment and Sustainability	4	6	Reduced truck idling at gates and shorter queues decrease fuel consumption and local emissions.
Social and Community Responsiveness	5	7	Smoother truck flow reduces traffic spikes affecting nearby rural roads and towns like Grobnik, Škrljevo, and Kukuljanovo.



4. Conclusions

In topic no. 1, “transport flow management and vehicle booking systems”, the participating partners developed, tested and implemented in their different sites complementary approaches on co-design, test and evaluate pilot action for improving the last mile accessibility of CE rural/peripheral areas to TEN-Ts through ICT.

At the project start the three parties were in different status of finalisation of the Pilot Actions, therefore, each of them had slightly different approach to tackle the problem described at the co-design phase. There projects were the followings.

LP improved its PCS with additional functionalities, enabling the smooth entry/exit of vehicles in the port of Trieste, directing them to the right terminal.

PP5 had a problem with the identity card of the users, as only physical could be used, which lead to lot of wasted time, as the truck drivers must have gone to the Port Authority’s premises in order to get the cards. Therefore, implementation of digital identity cards and introduction of 16 new readers significantly improved the efficiency of trucks’ entry of the ports. PP5 also extended and modernised the “Portunus” VBS used in Rijeka, integrating it with digital card issuance system for access to the port operational area.

PP7 had no VBS system at the start of the project, trucks arrived whenever they could and wanted, creating huge peaks of trucks’ arrivals during a day and some days of a week, consequently creating a huge queue in front of the terminal, creating huge waiting time. To tackle this problem, in ACCESSMILE project PP7 developed a truck calling system in their main site in Budapest Port - including purchasing two displays - to invite the truck to enter at the right time in the right gate, truck and container checking staff got a new device, with help of OCR being able to record the check protocols automatically in the system upon arrival at the terminal with handheld devices.

All the three group members have developed clear and specific pilot actions, which helped improving the transport flow efficiencies and reducing the waiting time of the trucks. The improvements support the catchment places in the rural and peripheral areas, so that they can be involved more in the intermodal transport.

With the help of implementation of the pilot actions, the participating partners benefit from several aspects, like:

- Technological Advancement and Digitalization
- Safety and Security
- Port and Terminal Operations and Management
- Customer Service and Satisfaction
- Environment and Sustainability
- Social and community responsiveness

From Technological Advancement and Digitalization point of view: the technological advancement and digitalization are increasingly becoming essential part of business in terms of controlling the entrance-exit system in ports/terminals. The use of technology can help improve efficiency, increase security, and enhance the overall customer experience. The Pilot Actions support innovation, digitalization, automation, smart port technology and IT infrastructure security.

From Safety and Security point of view: safety and security are essential considerations for the overall port authority and terminal business. These facilities can be high-risk areas for accidents and theft, so it is critical to take steps to ensure the safety and security of staff and customers. Results of the Pilot Actions



implementation will mean improved safety, development of emergency response plan and risk management, improved security measures, and training plus education for employees

From Port and Terminal Operations and Management point of view: effective port/terminal operations and management are essential for the successful integration of entry-exit terminals. To achieve this Pilot Action, contribute to better Port/Terminal management, efficiencies, capabilities and operation costs

From Customer Service and Satisfaction aspects: a high level of customer service can lead to repeat business and positive reviews, while poor service can lead to a negative reputation and loss of business. The implementation of the Pilot Actions will contribute to customer satisfaction and feedback, customer experience and service reliability.

From Environment and Sustainability aspects: environment and sustainability are crucial considerations for port and terminal operations. They can have a significant impact on the local environment and the communities that depend on them. Pilot Actions will foster green solutions, sustainable development, environmental protection and CO2 reduction.

From Social and community responsiveness point of view: social and community responsiveness are critical considerations for the port authority and terminal business. These facilities play an essential role in their local communities and must be responsible and responsive to the social and community needs and concerns. Pilot Actions will support employee satisfaction and engagement, labour relations, corporate social responsibility and Port community involvement.