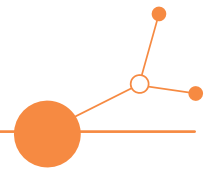# Action plan for improving the last mile accessibility of CE rural/peripheral areas to TEN-Ts through traffic management IT tools and VBS

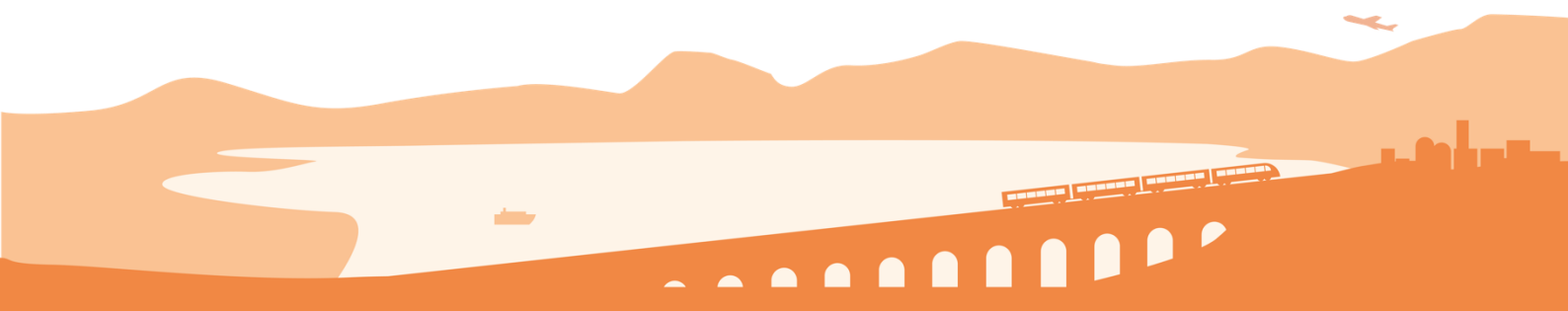## Deliverable no. D.1.2.3 – output no. 1.3

Version 2

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Introduction

Activity 1.1 is devoted to jointly planning the improvement of accessibility of rural and peripheral areas to TEN-T nodes through IT tools, covering the three domains of:

1. Vehicle Booking Systems/pre-arrival or pre-exit notification, port/terminal gates;

2. Port/terminal gates and interoperability among public/private IT systems;

3. Cargo bundling

Aim of this document is to provide PPs with a common template as to co-design Deliverable D.1.2.3 "Action Plan for improving the last mile accessibility of rural/peripheral areas to TEN-Ts through ICT".

1. Executive summary

Project Partners have jointly evaluated and discussed an Action Plan how to improve the last mile accessibility of rural/peripheral areas to TEN-Ts through ICT.

All participating partners in Topic 1. "Vehicle Booking Systems/pre-arrival or pre-exit notification, port/terminal gates", LP, PP5 and PP7 suffer from the fluctuating transport flow, which considerably slows down the entering and exiting processes of the trucks. This causes huge congestion at the front of the port/terminal and the arriving trucks usually have to wait several hours before they can enter.

The group members are convinced that with the help of ICT development the fluctuation can be reduced, the truck-flow can be better managed and the time spent in the port / terminal can be considerably reduced, so that rural and peripheral areas can be better and faster reached

After having set up the working group, identifying and involving stakeholders, the project partners jointly develop Action Plan, even if the Action Plans can be different at each partner. All Action Plans are 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.

All the three parties plan to introduce and/or develop a Vehicle Booking System (VBS). As they are in different development stage of this system development, the action are somehow different, however, all actions aim the same result, to improve the transport flow, finding ideal place and ideal way of trucks' parking place and port entering processes, including trucks' calling in and inspection.

Based on the Strategy, all project partners have designed their own Action Plans:

LP

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

Port of Trieste intends to outsource some activities, such as
- Pre-exit notification
- Slot booking management system

They intend to have PCS in the port of Monfalcone and Upgrade of the pre-arrival notification process, with establishing Interoperability with the AIDA system (Customs Agency) for the pre-exit notification and Interoperability with the AIDA system (Customs Agency) for e-CMR. Further developments are Digitalisation of the A22 module and Interoperability with SUDOCO

All these activities will be made through the upgrade of the port's Port Community Systems.

LP plans to link the existing FENIX project - A European Federated Network of Information eXchange in LogistiX project, co-funded by the Connecting Europe Facility Programme- with ACCESSMILE. Within ACCESSMILE, the LP will realise the pre-exit notification for trucks

PP05

The Port of Rijeka uses an IT platform called Portunus, through which users of port services request access to the port operational areas. The system needs to be upgraded to fit the needs of the port's users located in its hinterland.

Currently, users use ID cards, which must pick up personally at the premises of Port of Rijeka Authority, with long time needed for entry in the port, PP5 would like to improve system to accept digital cards to

enter port. Within ACCESSMILE, Port of Rijeka Authority will make it possible for users to obtain and use a complete digital identity card.

PP5 also would install 15 new readers supporting this technology, multi readers would be installed at the entrances to the port operational areas (multi-technology RFID, NFC, and Bluetooth® touch screen/keypad reader is equipped with a QR code / barcode module).

PP 07

Today the trucks do not have dedicated parking place for waiting, there is a huge congestion and queue, MAHART Container Center does not have a slot booking system yet, therefore arrival time of a truck cannot be managed or anticipated. Due to this process, currently the trucks have to wait several hours before entering the port, making it impossible to reach rural and peripheral areas by truck in one day,

Therefore, following actions plans are developed by the PP7: the number on entry lanes from 2 to 3 , in order to accelerate terminal entry process. VBS will be introduced, giving the possibility to the customers and/or truck drivers to book a slot for trucks arrival.

MCC will rent a new, dedicated parking area in the logistic Centre, where the arriving trucks must check in. The trucks will wait there and will be called in to the terminal from this designated parking area, with the help of monitors and barrier system.

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).

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

These pilot actions are fully aligned with the strategic aim of project ACCESSMILE, "Improving ACCESSibility of last MILE connections of rural and peripheral regions to main TEN-T nodes in Central Europe through ICT", as all action plans of the three project partners help the accessibility and outreach of the rural and peripheral areas. When all developments are will be operational, will grant the expected benefit of the project.

During the Stakeholder involvement, the PPs have their action plans endorsed by the Stakeholders, who are also convinced that the development projects will support the aim of optimizing the transport flow, reducing fluctuation of the arriving trucks and fastening the entry and exit processes, avoiding huge congestions and giving possibility to support connection with rural and peripheral areas.

Reducing the waiting time and improving the truck inbound-outbound process will also have a positive effect on environment protection. Trucks will have much less CO_2 emission with minimizing the time spent in a queue, with switched on motor and moving slowly truck-by-truck, emitting pollution to the air. Instead of this, the trucks will arrive at a pro-booked slot and will have much faster gate in and out process.

With eliminating trucks' waiting time, a smaller number of trucks can fulfil the same transport tasks than presently, also adding positive effect on environmental solution.

2. Identification of the actions

2.1. Mapping the actions

LP

ACTION/MEASURE	ESTIMATED COST	TIME HORIZON
Pre-exit notification of trucks leaving the port of Trieste	*90.000 euros*	*2025*
Slot booking management systems of trucks directed to the port of Trieste	*124.350 euros*	*2026*
Development of a new GOS (Gate Operating System) for the port's gates	*178.000 euros*	*2027*
e-CMR IT components in the PCS	*38.150 euros*	*2030*

PP05

ACTION/MEASURE	ESTIMATED COST	TIME HORIZON
Access to the port operational areas with digital card	*50.000 euros*	*2025*
Time slot Management system	*75.000 euros*	*2028*
Integration with future PCS system	*50.000 euros*	*2027*

PP07

ACTION/MEASURE	ESTIMATED COST	TIME HORIZON
Development of a slot booking IT tool for entering/exiting the port	*150.000 euros*	*2025*
Development of a new GOS (Gate Operating System) for the port's gates	*100.000 euros*	*2025*

2.2. Setting the actions

In this section, please describe the actions included in the previous table. Please find some examples as guidance. Please replicate this table for each action.

LP

Action no. 1: Pre-exit notification of trucks leaving the port of Trieste	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	This activity involves the analysis and design of the application solution to be implemented for the digitization of the procedures for the pre-exit notification from the port of Trieste of goods by road, in order to automate the operations necessary for the affixing of the visa leaving the port. This activity represents a project, which will be developed in partnership between Customs and Monopolies Agency (ADM) and PNAEAS, and has the following objectives: • realization of the pre-exit notification of goods leaving the port. The pre-exit notification will be realized within the PCS Sinfomar in a new dedicated module and can be transmitted, through interoperability between ADM and PNAEAS, to customs systems. Advance notice will be completed with the control of vehicles at the exit gate from the port of Trieste; • Automation of the exit from the port by the Finance Police (Guardia di Finanza).
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	Project design Tender Software upgrade
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	• PNAEAS • Maritime Authority • Border Police • Port community • Representatives of shippers and logistic operators located in peripheral areas – or their associations The first three categories of stakeholders defined are directly involved in the port entry authorization process; along with the Port Community and operators from peripheral areas, they will all be direct beneficiaries of the action
Timeline *Indicate the time horizon for the implementation of the action*	By 2025
Investment cost	90.000 euros

How much will cost the construction/realization of the future initiative/action/technology?	
Sources of financing *What are the sources of financing? Private capital, public capital, CEF, etc... How much is the share covered by each of them?*	European and own funds
Impact of the initiative - environment *How does this action contribute to environmental sustainability requirements and the related reduction of road transport related emissions?*	Currently, when a ship arrives and cargo is downloaded, ITUs which continue their journey from Trieste to their destinations are loaded on trucks, building a long queue at the port gates, with ensuing air pollution and GHG emissions. The pre-exit notification will reduce such queues, and the harmful effects on the environment as well.
Impact of the initiative – accessibility of peripheral regions *How does this action contribute to improving the accessibility of peripheral regions in the hinterland?*	The reduction of queues at the port gates positively affects the accessibility of the hinterland, since road transport is mostly used by shippers located in the regional peripheral areas, short distances not allowing rail transport.
KPIs *Please identify the KPI to be used for measuring the action's impact*	Number of pre-exit notifications

Action no. 2: Slot booking management systems of trucks directed to the port of Trieste

Description of action/measure *Describe the action foreseen and the expected results from its implementation*	The procedure for the realization of the slot booking to be completed requires two phases: • the first phase consists in the realization of a new PCS Sinfomar module dedicated to the port terminal operators that allows to include these operators in the data exchange procedures within the port community using procedures present and to be developed in Sinfomar • the second phase consists in the realization in the complete slot booking system in order to optimize the traffic and to reduce the waiting time of the haulier inside the terminal in the phase of picking up the container destined to exit the terminal/port The main objective and results will be to pass from the current pre-arrival notification on a daily basis to an hourly basis.
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	Project design Tender Software upgrade

Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	• PNAEAS • Maritime Authority • Border Police • Port community • Representatives of shippers and logistic operators located in peripheral areas – or their associations The first three categories of stakeholders defined are directly involved in the port entry authorization process; along with the Port Community and operators from peripheral areas, they will all be direct beneficiaries of the action
Timeline *Indicate the time horizon for the implementation of the action*	By 2026
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	124.350 euros
Sources of financing *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	European and own funds
Impact of the initiative - environment *How does this action contribute to environmental sustainability requirements and the related reduction of road transport related emissions?*	Trucks can enter the port of Trieste only if it has registered for a "pre-arrival notification". Yet, this authorisation is given on a daily basis. This means that trucks can build a long queue at the port gates, with ensuing air pollution and GHG emissions. The slot booking system will work on an hourly basis, reducing such queues, and the harmful effects on the environment as well.
Impact of the initiative – accessibility of peripheral regions *How does this action contribute to improving the accessibility of peripheral regions in the hinterland?*	The reduction of queues at the port gates positively affects the accessibility of the hinterland, since road transport is mostly used by shippers located in the regional peripheral areas, short distances not allowing rail transport.
KPIs *Please identify the KPI to be used for measuring the action's impact*	Number of slot booking notifications

Action no. 3: Development of a new GOS (Gate Operating System) for the port's gates	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	The dedicated port gate automation system must be able to make the detections to uniquely identify transits at each vehicular and pedestrian track, and then be able to provide the relevant detected information to the Sinfomar PCS. The

	transits must then be associated with moving objects in the internet of things (IOT) logic and other information, such as, in the case of cargo, the customs status of the goods, authorizations to enter port areas, Transit Permits, etc. The concept of a port gateway in which all processes are linked must apply regardless of the hardware and software technology or instrumentation employed. Theoretically, such a system could also function with manual data surveys and recordings. Thus, the technology component must provide operational support and better working conditions for operators. This implementation must provide an architecture that allows for maximum flexibility, so that the component dedicated to the automation of port gates can receive the data not reprocessed by the different systems (field infrastructure) and has within it the ability to create the necessary associations between the different data, and provide reporting, statistics and analysis activities. It is required to be designed as an open system owned and controlled by PNAEAS. Such components will have to have the possibility to interface also with mobile apps and with additional systems related to port processes, not only related to the operation of the gates.
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	Project design Tender Software upgrade Purchase of equipment
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	• PNAEAS • Maritime Authority • Border Police • Port community • Representatives of shippers and logistic operators located in peripheral areas – or their associations The first three categories of stakeholders defined are directly involved in the port entry authorization process; along with the Port Community and operators from peripheral areas, they will all be direct beneficiaries of the action
Timeline *Indicate the time horizon for the implementation of the action*	By 2026
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	124.350 euros
Sources of financing	European and own funds

What are the sources of financing? Private capital, public capital, CEF, etc... *How much is the share covered by each of them?*	
Impact of the initiative - environment *How does this action contribute to environmental sustainability requirements and the related reduction of road transport related emissions?*	Trucks can build a long queue at the port gates, with ensuing air pollution and GHG emissions. The new GOS will allow for an enhanced monitoring and management of inbound and outbound road flows, reducing congestion, and the harmful effects on the environment as well.
Impact of the initiative - accessibility of peripheral regions *How does this action contribute to improving the accessibility of peripheral regions in the hinterland?*	The reduction of congestion at the port gates positively affects the accessibility of the hinterland, since road transport is mostly used by shippers located in the regional peripheral areas, short distances not allowing rail transport.
KPIs *Please identify the KPI to be used for measuring the action's impact*	Number of users of the new GOS

Action no. 4: e-CMR IT components in the PCS	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	The objective of this activity is to implement a new interoperability component with the AIDA system (of the Customs Agency) in order to include, within the Pre-arrival notification, data related to the electronic management of CMR (e-CMR). This project will be carried out in collaboration with the Customs Agency, with which PNAEAS has shared the aims of this activity. The expected output will be realized not only in the implementation of new components within the PCS (and respectively also in AIDA) but also in the implementation of a complete pilot, tested in the port of Trieste. The port of Trieste, thanks to this activity, will represent the first case in which a port of call is directly involved in activities related to the e-CMR procedure. The data to be managed concern, as defined by the data model being developed by the Customs Agency: • Shipment, Shipper, Shipment Mandate, Shipper, Seller, Consignee, Carrier, Forwarder • Loading Place, Loading Date. Delivery, Incoterms®, Attached Documents. • Delivery grouping, Packages, Packing type • Description of goods, Gross weight, Volume, Total packages, Total weight • Completion and Signatures

Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	Project design Tender Software upgrade
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	• PNAEAS • Maritime Authority • Border Police • Port community • Representatives of shippers and logistic operators located in peripheral areas – or their associations The first three categories of stakeholders defined are directly involved in the port entry authorization process; along with the Port Community and operators from peripheral areas, they will all be direct beneficiaries of the action
Timeline *Indicate the time horizon for the implementation of the action*	By 2030
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	38.150 euros
Sources of financing *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	European and own funds
Impact of the initiative - environment *How does this action contribute to environmental sustainability requirements and the related reduction of road transport related emissions?*	The e-CMR or electronic CMR is the digital equivalent of the CMR Transport Document in paper-based format that is used and signed in 4 copies (sender, consignee, carrier and administration. Its use implies adherence to the CMR Agreement (*Contrat de Transport International de Marchandises par Route*) that regulates it. In its paper-based format, the CMR Transport Document brings many benefits: it harmonises contractual conditions for goods transported by road and helps facilitate goods transport overall. A global e-CMR solution would retain all these benefits, but would make the system more modern, by removing paperwork and handling costs Some of the benefits to e-CMR include: 1) Lower costs • Handling costs can be up to three to four times less expensive.

	• Faster administration with reduced data entry, no paper handling, no fax/scan/letter exchanges, no paper archiving, etc. • Faster invoicing. • Reduction of delivery and reception discrepancies. 2) Greater Transparency • Data accuracy • Control and monitoring of the shipment • Real-time access to the information & proof of pick-up and delivery. Because of its digital nature, e-CMR can also be easily integrated with other services used by transport companies, e.g. customs declaration or transport & fleet management services. By moving to an electronic format, the three parties involved in each shipment benefit from increased overall efficiency of logistics, resulting in increased economic competitiveness. A final benefit is greater road safety, as e-CMR can be linked to eCall, a system for trucks that automatically dials emergency services in the event of a road traffic accident. The digitalisation of the CMR entails a faster data exchange among interested parties, especially in the whole supply chain. Thanks to this, cargo bundling will be made easier, reducing the need for empty trucks on the roads, reducing air pollution and GHG emissions.
Impact of the initiative – accessibility of peripheral regions *How does this action contribute to improving the accessibility of peripheral regions in the hinterland?*	Not only does the transport of goods between peripheral areas and the main nodes of the TEN-T networks mainly occur by road, but it is often done through almost empty vehicles and empty returns. The e-CMR will allow road haulers located in peripheral regions in the hinterland to exchange data more easily, making it easier for different cargo to be bundled.
KPIs *Please identify the KPI to be used for measuring the action's impact*	Number of users of the e-CMR

Action no. 1: Access to the port operational areas with digital card	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	Existing IT platform called Portunus, in the port of Rijeka needs to be upgraded with new for it to fit the needs of the port's users located in its hinterland. Currently, users use ID cards, which must pick up personally at the premises of Port of Rijeka Authority, This activity will make it possible for users to obtain and use a complete digital identity card.Together with the new application solution, 15 new readers supporting this technology would be installed. This means that multi readers would be installed at the entrances to the port operational areas (multi-technology RFID, NFC, and Bluetooth® touch screen/keypad reader is equipped with a QR code / barcode module).
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	Technical and bidding documentation Tender Bid evaluation Implementation
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	Concessionares including agents Maritime police Harbour master Custom Agency
Timeline *Indicate the time horizon for the implementation of the action*	By 2025
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	50.000 EUR
Sources of financing *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	European and own funds

	High waiting time for vehicle at the terminal gates of port is an issue that is increasingly receiving more attention. Long queues terminal gates waiting to pick up or deliver a container lead to congestion further upstream, and induce emissions, costs, and delays.
Impact of the initiative - environment *How does this action contribute to environmental sustainability requirements and the related reduction of road transport related emissions?*	The technology of digital card could be NFC, bluetooth or qr code to verify the identity of the user andaccess to the controlled area, depending on the most suitable IT solution This pilot action would 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.
Impact of the initiative - accessibility of peripheral regions *How does this action contribute to improving the accessibility of peripheral regions in the hinterland?*	The Port of Rijeka is located in the center of the city, a large number of vehicles causes large city congestion, slow flow of cargo and increased air pollution. Reducing the waiting time for the entrance to the port has a positive effect on the availability of the hinterland and on-time arrival for loading/unloading of cargo.
KPIs *Please identify the KPI to be used for measuring the action's impact*	entry request number

Action no. 2:	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	Prerequisites for time slot management to be functional are: Correctness of the appropriate module within the PCS system and completion of the Vehicle booking system in the entire port area. One of the main objectives are receiving notifications of pre arrival on hurly basis of course the total number of requests.
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	Technical and bidding documetation Tender Bid evaluation Implementation
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	Concessionares including agents Port Community Maritime police Harbour master Custom Agency The Concesionares, Port Authority and Border Police will have direct beneficiaries from this

Timeline *Indicate the time horizon for the implementation of the action*	**By 2028**
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	**75.000 EUR**
Sources of financing *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	European and own funds
Impact of the initiative - environment *How does this action contribute to environmental sustainability requirements and the related reduction of road transport related emissions?*	A well-designed system and compliance with all parties involved can also improve the coordination of cargo transportation activities, reducing truck turnaround times and improving overall terminal efficiency, which directly affects pollution reduction.
Impact of the initiative – accessibility of peripheral regions *How does this action contribute to improving the accessibility of peripheral regions in the hinterland?*	The Port of Rijeka is located in the center of the city, a large number of vehicles causes large city congestion, slow flow of cargo and increased air pollution. Reducing the waiting time for the entrance to the port has a positive effect on the availability of the hinterland and on-time arrival for loading/unloading of cargo
KPIs *Please identify the KPI to be used for measuring the action's impact*	Tracking truck visit time and booking notifications

Action no. 3: Integration with future PCS system	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	Perform an extended integration for the announcement of the arrival of freight vehicles with the existing PCS system in such a way as to achieve sigle data entry.
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	System analysis and mapping Creating a functional specification Development of WEB services Testing Production

Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	Concessionaires including agents Port Community Maritime police Harbour master Custom Agency
Timeline *Indicate the time horizon for the implementation of the action*	2025 - 2026
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	Estimated 100.000 €
Sources of financing *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	European and own funds
Impact of the initiative - environment *How does this action contribute to environmental sustainability requirements and the related reduction of road transport related emissions?*	Reduced printed documents, reduce fuel emission and faster cargo delivery.
Impact of the initiative – accessibility of peripheral regions *How does this action contribute to improving the accessibility of peripheral regions in the hinterland?*	Reduced traffic jams in hinterland.
KPIs *Please identify the KPI to be used for measuring the action's impact*	Reduce truck visit time, less traffic jams and improvement of environmental protection using data from measuring stations

Action no. 1: Development of a slot booking IT tool for entering/exiting the port	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	the IT system will be developed, so that truck drivers/companies will pre-book time slot at the terminal via their public/private IT systems, in order to reduce waiting time at the terminal. Trucks will wait at a dedicated parking place before entering the terminal. Expected results: - avoiding congestion and queue in front of the terminal - reducing time wasted before entering the terminal, so rural and peripheral areas can be served quickly and empty containers returned at the same day - CO2 pollution reduction of the trucks while waiting in the queue - reducing fluctuation of the truck flow, as many trucks accepted for entering, as many can be served simultaneously
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	- definition of required VBS software - sharing experience with the other PPs to learn how their software works - tendering and selection of the software company - meantime contracting rented parking area - equip the parking area with office container premises, IT systems - implementation - testing - go live
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	- customers: shipping lines and forwarders Maersk line, MSC, Evergreen, Hapag Lloyd, Hoyer, Bertschi - rail operators: TO Delta - Trucking companies: LKW Walter, Medlog, WSZL All of them will benefit by the project due to the quicker loading process, however, also beneficiaries are the rural and peripheral areas
Timeline *Indicate the time horizon for the implementation of the action*	by 2025
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	- ICT development: € 50,000 - investment in increasing and re-designing the entry lines and parking area: € 100,000
Sources of financing *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	- ICT development financed by ACCESSMILE (80% Interreg funds and 20% own contribution) 80% Interreg, 20% private capital - parking area development financed by MCC own sources, 100% own investment, without EU funds (ACCESSMILE will not be involved here)

	100% private capital Altogether 27 % Interreg and 73 % private capital
Impact of the initiative - environment *How does this action contribute to environmental sustainability requirements and the related reduction of road transport related emissions?*	Quicker loading processes will have following impact: - less queue in front of the terminal - less CO emission and less fuel consumption - less trucks can serve the same volume - save fossil fuel consumption
Impact of the initiative – accessibility of peripheral regions *How does this action contribute to improving the accessibility of peripheral regions in the hinterland?*	Impact on the accessibility of peripheral areas: - drivers can work 9 hours in a day (including waiting time) - destination over150-200kms (upto 400kms) can be served within a day - with waiting time of 1 hour a truck with 1 driver can deliver the container to peripheral and rural areas and container can be returned the same day - competitional disadvantage of rural and peripheral area can be reduced
KPIs *Please identify the KPI to be used for measuring the action's impact*	- truck turn time - truck average waiting time - number of trucks handled annually vs number of administrative staff - average waiting time of the trucks - number of partners using time slot booking - data punctuality

Action no. 2: Development of a new GOS (Gate Operating System) for the port's gates	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	The trucks will first call at the dedicated area, the trucks that have pre-booked slots can either proceed immediately to the terminal gate (if they are in the slot) or can wait at the parking area until their slot opens. The Gate Operating System will signal to the truck driver when the slot is open and when they can proceed to the terminal. In case the truck is called in, the barrier will allow the truck to leave parking place and enter the terminal gate.
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	- definition of required GOS software - sharing experience with the other PPs to learn how their software works, if any - tendering and selection of the software company - implementation - testing - go live
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	- customers: shipping lines and forwarders Maersk line, MSC, Evergreen, Hapag Lloyd, Hoyer, Bertschi - rail operators: TO Delta - Trucking companies: LKW Walter, Medlog, WSZL

	All of them will benefit by the project due to the quicker loading process, however, also beneficiaries are the rural and peripheral areas
Timeline *Indicate the time horizon for the implementation of the action*	- 2025
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	- ICT development: € 30,000 - equipment (displays, barriers): € 10,000 - further investment in parking: € 60,000
Sources of financing *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	- ICT and equipment: 80% Interreg funds 20% own contribution, private funds - investment 100% private capital - altogether 32% Interreg funds (ACCESSMILE) and 68% private capital
Impact of the initiative - environment *How does this action contribute to environmental sustainability requirements and the related reduction of road transport related emissions?*	Quicker loading processes will have following impact: - less queue in front of the terminal - less CO emission and less fuel consumption - less trucks can serve the same volume save fossil fuel consumption
Impact of the initiative - accessibility of peripheral regions *How does this action contribute to improving the accessibility of peripheral regions in the hinterland?*	Impact on the accessibility of peripheral areas: - drivers can work 9 hours in a day (including waiting time) - destination over150-200kms (upto 400kms) can be served within a day - with waiting time of 1 hour a truck with 1 driver can deliver the container to peripheral and rural areas and container can be returned the same day competitional disadvantage of rural and peripheral area can be reduced
KPIs *Please identify the KPI to be used for measuring the action's impact*	truck turn time - truck average waiting time - number of trucks handled annually vs number of administrative staff - average waiting time of the trucks - number of partners using time slot booking - data punctuality

3. Contributions to environmental sustainability and accessibility of peripheral regions in the hinterland, topic.1. "Vehicle Booking Systems/pre-arrival or pre-exit notification, port/terminal gates"

This chapter explores how the identified actions support the project's main objectives. i.e. the improvement of the accessibility of rural and peripheral regions to the TEN-T nodes and networks while at the same time enhancing the environmental sustainability of last mile road transport.

All the three Project Partners have carefully examined the contribution of their respective Action Plans to the environmental sustainability and the accessibility of the rural and peripheral regions.

LP – Port of Trieste

All identified goals contribute to the goals of environmental protection and improvement of accessibility of peripheral areas in the hinterland. Indeed, they are closely intertwined.

The maritime industry is a major carbon emission contributor. Therefore, the global maritime industry puts every effort into reducing carbon emissions in the shipping chain, which includes vessel fleets, ports, terminals, and hinterland transportation. A representative example is the carbon emission reduction standard mandated by the International Maritime Organisation for international sailing ships to reduce carbon emissions this year. Among the decarbonisation tools, the most immediate solution for reducing carbon emissions is to reduce vessel waiting time near ports and increase operational efficiency.

On the port and hinterland side, the operation efficiency improvement in maritime stakeholders' port operations can be achieved using data. This data collection and operational efficiency improvement can be realised using several types of digital innovation tools.

Digitalisation of current paper-based procedures, jointly defining common IT standards, increase of data visibility and data exchange, interoperability between IT systems of public entities and private operators are all common features and the basis for the four goals identified in the LP's strategy.

In order to achieve these targets and ensure decoupling of carbon emissions from economic growth, policy makers have begun to focus, encourage, and foster the five Ds, namely, democratization, decarbonisation, deregulation, decentralization, and digitalisation.

Since digital technologies are transforming every aspect of our daily life, and with the next Industrial Revolution evolving around "digital technology," it is appreciated that digitalisation could possibly help address this dilemma of emission control and reduction. Hence, the concept of "Ds" that is based on five foundational pillars is being encouraged. These include development of transition architecture from the existing system to low carbon system; increasing use of alternate fuels and renewable energy; encouraging energy storage devices; extensive use of data and analytics to empower users; and creation of individual users as power generating systems. While the concept exists, one realises that it is difficult to implement due to non-existent systems and hence requires some serious efforts to achieve the desired low-carbon economy. In this regard, an increased use of technology for a more decentralised and digitalised scenario is considered a good opportunity to create the required transition architecture for the energy system.

Hence, from and environmental point of view, through the four goals to be later detailed in the action plan - the LP aims to speed up the entry and exit of trucks in the ports, reducing congestion at gates thereby decreasing the ensuing air pollution and carbon emissions generated by truck engines.

Digitalisation has also a relevant impact on the accessibility of regional peripheral areas to the port of Trieste, being a TEN-T core network port.

Indeed, Modal shift from road to rail of freight is economically convenient only for long distances. For short distances, road transport is the only option. Yet, road first/last mile connections between the hinterland and the main nodes of the transport network are the most inefficient processes in the entire supply chain, with negative impacts air pollution and CO_2 emissions.

Therefore, the goals of digitalization identified by the LP – as it is certainly the case of all the other PPs – for improving the entry and exit of trucks in the ports will benefit mostly those shippers, logistic operators, road haulers located in the peripheral areas around the region of the main nodes, since they have no alternative for accessing the port of Trieste other than the inefficient last mile road transport.

PP5 – Port of Rijeka

The Port of Rijeka has developed an IT platform called Portunus, through which users of port services request access to the port operational areas. Such a system needs to be upgraded with new for it to fit the needs of the port's users located in its hinterland.

Currently, users use ID cards, which must pick up personally at the premises of Port of Rijeka Authority, with longer time needed for entry in the port. Also, in the future some users would use digital cards to enter port operational areas under jurisdiction of Port of Rijeka Authority.

Within ACCESSMILE, Port of Rijeka Authority will make it possible for users to obtain and use a complete digital identity card.

Together with the new application solution, 15 new readers supporting this technology would be installed. This means that multi readers would be installed at the entrances to the port operational areas (multi-technology RFID, NFC, and Bluetooth® touch screen/keypad reader is equipped with a QR code / barcode module).

The issuing and verifying users will be 100% digital, reducing the time for entering in the Port of Rijeka.

The new system will endow port users with an easier and more practical way of obtaining permits with efficient use of time and material resources, optimising transport flows in/out of the Port of Rijeka, reducing congestion at the port entrance and on the city streets leading to the port terminals.

The investment consists in the purchase of QR code readers, aiming to streamline traffic flows to /from the Port of Rijeka. This will have a positive impact on the environment, both in terms of pollution and GHG emissions, since congestion to/from the port will be reduced.

PP7 – Mahart Container Center

MCC is at the edge of the operational capacities, the demand is fluctuating (time to time and even within a day) and at the peaks it already creates difficulties of the terminals even on the rail side.

MCC has made a lot of efforts already to ease this congestion, however, the processes for receiving trucks did not improve significantly. At the peaks it is possible that over 100 trucks are waiting inside the logistic center (Budapest Free Port) to enter MCC. Almost every day in the morning and afternoon hours there is a congestion, when average turn time of a truck (waiting, checking, handling, administration and leaving) can reach 4 hours. During noon and the night there is free capacity as very few trucks arriving at the terminal for loading.

This creates problem for the trucking companies, the owner of the site, to the customers as well as the terminal itself. Every day is a period when there is a congestion at the logistics site, trucks' queue occupies

the transport lanes of the Freeport. While waiting, and proceeding to the entrance truck by truck, the trucks' emission on CO2 is huge, there is a considerable environmental effect. One hour less idling of the waiting trucks can have a significant environment protection effect.

MCC has a strategy, with the help of ICT development and VBS system will avoid queues, so less fuel will be consumed by the trucks, consequently less CO2 will be released to the air, which will protect environment. Terminal will make sure that the trucks are not queuing after each other, but are waiting at a designated, safe area, during parking the engine can be switched off, without releasing CO to the air. The trucks will be called in when there is a slot for handling the particular truck, avoiding congestion and CO pollution in front of the terminal. Reducing trucks' waiting in a queue will save use of fossil energy.

On top of that there is another factor that contributes to environmental protection and reduction of pollution, this is that fewer trucks can serve the same volume. If trucks don't spend their time with idling and waiting to be loaded, but they arrive at their pre-booked slots, with good truck management the trucking companies can fulfil the same amount of the tacks with less trucks. Less trucks also mean less pollution and energy consumption.

The problem with supplying the rural and peripheral areas are mainly with the allowed driving time of the truck drivers. According to the present rules, the 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).

With 4 hours turn time at the terminal plus 2 x 3-4 hours driving time + 2 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 is a need to reduce the truck turn time to (or below) one hour, in order to make it possible that the truck can return the container in the same day from the rural and peripheral area.

Currently, if a container should be delivered to the area over 150-200 kms from the terminal, the trucks that are collecting the empty containers from the terminal, can go to the destination and load the container, however, the driver must take the compulsory rest time and return the loaded container for loading of the train during the next day. This gives additional costs, longer transit time and consequently competitive disadvantage to those areas.

Currently there are peaks when there are up to 100 trucks are waiting for handling at MCC terminal, with an average 4-5 hours waiting time, in order to make it possible that farther destinations can be also served within a day, the trucks turn time must be reduced to an average 1 hour.

MCC has several plans to fasten the turn time, including change (increase) of entry / exit lanes to the terminal, improve control of truck flow with an IT tool for Vehicle Booking Systems/pre-arrival or pre-exit notification, as well as terminal gates and interoperability with IT systems (calling in process and system).

With finalization of above projects, the transport flow can be optimized, therefore the waiting time can be reduced, resulting in less environmental pollution and avoiding the competitive disadvantage of the rural and peripheral areas.

4. Conclusion

The participants of the topic no. 1 – "Vehicle Booking Systems/pre-arrival or pre-exit notification, port/terminal gates" developed their action plan based on their respective strategy and vision. After all the project partners also had a virtual meeting together, where the group members discussed the current situation, their actio plans for improving the last mile accessibility of rural/peripheral areas to TEN-Ts through ICT, as well as the experience and feedback from each other.

The project partners concluded that the action plan is in line with the vision and strategies, they have phrased earlier.

The vision of LP is : "To steer the development of the port community by promoting technological innovation and boosting digital growth for a seamless supply chain, better integrating rural and peripheral areas."

Vision of PP5 is: "To reach the higher level of multimodality, based on improved infrastructure, improved ICT solutions and high level of cooperation in multimodal chain."

Vision of PP7: "Mahart Container Center will work with paperless administration, automated data transfer, involving as low manual work as possible, optimizing capacities with helping hand of digitalization and data transfer asset tools, software. Mahart Container Center will use up-to-date IT solutions, including vehicle booking system and truck calling system, in order to provide smooth loading processes for the trucks with a turn time of less than one hour, avoiding the competitive disadvantage of the rural and peripheral areas."

As at each port/terminal one of the main problems is the huge trucks waiting time of the trucks, before entering and even before leaving. This puts the rural and peripheral areas to competitive disadvantage, as the waiting time makes it more difficult to reach these areas by truck on the day of loading. The waiting time has also negative effect on the environment, due to the CO emission during trucks' queueing. This waiting time can be considerably lowered with the help of ICT development for better transport flows and Vehicle Booking Systems.

Although the three participating parties are using different IT platforms and management systems and they are in different development status of using VBS systems, by sharing the respective actions the involved PPs have identified several synergies.

Port of Rijeka is at the most developed status of using VBS system, called Portunus, the system needs to be upgraded to fit the needs of the stakeholders, including port's users located in its hinterland mainly about development of digital cards to enter port, including 15 new multi-tasking readers. By the development of the process and system, they could set path for the other PPs and share best practices, so that they can chose the best systems for their VBS solutions.

Port of Trieste already uses some pre-arrival notification system, however, trucks' arriving time cannot be inserted, no slot-booking system is introduced yet, only the day of expected arrival. The development of the system should be made in partnership between Customs and Monopolies Agency (ADM) and PNAEAS, as well as with the Finance Police (Guardia di Finanza), where slot booking system and pre-exit notification system should be developed. These ICT developments should be realized within the Sinfomar system in a new dedicated module and can be transmitted, through interoperability between ADM and PNAEAS, to customs systems, automation of the exit from the port by the Finance Police (Guardia di Finanza).

Port of Trieste cannot "copy – paste" the system used by Port of Rijeka due to above reasons and the different IT platforms, however, when designing the specification of the development, they can learn from the systems used by PP05. LP also can develop the system in a way that in the future digital cards also can be used by the arriving/leaving trucks.

PP07 uses a tailor-made software for the terminal operations and the newly developed VBS and calling-in system should be embedded in this IT solution. However, with the specification already used by PP05 and LP, MCC can take the best practices and design the tender specification in the with learning from the other PPs and also take into account the potential further development possibilities (like digital cards).

As PP05 also has a dedicated parking area for the waiting trucks, they also can design their entry lane and parking place design with taking into account the learnings from PP05.

With the help of these synergies and best practice sharing, the three participating partners can reach a common platform where further developments could be harmonised and potentially upgraded simultaneously.

The PPs envisage the ACCESSMILE project contribution of environmental protection as follows:

LP

The vision of PNAEAS aims to reach a full-fledged development of the multimodal freight transport in the ports of Trieste and Monfalcone, steer the development of the port community by promoting technological innovation and boosting digital growth for a fully integrated supply chain, along with a continuous improvement of the ICT systems in order to make the port safer, more efficient and more sustainable.

Starting from this vision, four strategic goals have been defined.

According to the goals, an action plan has been evaluated to set up concrete actions capable to align our future ICT development with the vision and goals defined.

The Action Plan is based on four actions to be realised by 2030:

- Pre-exit notification of trucks leaving the port of Trieste

- Slot booking management systems of trucks directed to the port of Trieste

- Development of a new GOS (Gate Operating System) for the port's gates

- e-CMR IT components in the PCS

Upgrading the PCS to all the logistic infrastructures upon the competence of the PNAEAS will harmonize the different rules currently defined in each site aiming to an increment in procedure's efficiency and, therefore, fostering the growth for the two ports and their dry ports as logistic "buffer areas".

By doing so, PNAEAS aims to reduce air pollution and GHG emissions linked to road transport of the port.

At the same time, shippers, haulers and logistic operators located in the peripheral areas of the hinterland will benefit from these investments. In fact, since road transport is the only option for connecting rural and peripheral areas in the port's region, due to its closeness, making entry and exit of trucks to/from the port more efficient will yield a positive effect especially for those economic operators for which railway transport is not an option.

The action plan's vision is based on the following key words: #Neutrality, #Open-Source. #Interoperability. #Use of standards. All these key words are related to specific objectives that must be met to develop an ICT system to be shared and used by different operators, regional as well as European ones.

These actions, focused on ICT systems, have the main effect to reach a strong coordination and information exchange in the port-hinterland interface, providing a better coordination between all stakeholders and public authorities and, therefore, fostering a coordinated multimodal freight transport.

Such a vision considers the application and potential benefits for both the medium and long-distance rail transport and last mile road port-hinterland accessibility.

PP5

The Port of Rijeka uses an IT platform called Portunus, through which users of port services request access to the port operational areas. The system needs to be upgraded to fit the needs of the port's users located in its hinterland.

Currently, users use ID cards, which must pick up personally at the premises of Port of Rijeka Authority, with long time needed for entry in the port, PP5 would like to improve system to accept digital cards to enter port. Within ACCESSMILE, Port of Rijeka Authority will make it possible for users to obtain and use a complete digital identity card.

PP5 also would install 15 new readers supporting this technology, multi readers would be installed at the entrances to the port operational areas (multi-technology RFID, NFC, and Bluetooth® touch screen/keypad reader is equipped with a QR code / barcode module).

PP7

PP7 will develop a truck slot booking and calling-in system, in order reduce the arrival peaks of the trucks. As many slots will be available for the trucks, as many the terminal can handle, in order to avoid queue.

Today the trucks do not have dedicated parking place for waiting, there is a huge congestion, MAHART Container Center does not have a slot booking system yet, therefore arrival time of a truck cannot be managed or anticipated. Due to this process, currently the trucks have to wait several hours before entering the port, making it impossible to reach rural and peripheral areas by truck in one day,

Therefore, following actions plans are developed by the PP7: the number on entry lanes from 2 to 3, in order to accelerate terminal entry process. VBS will be introduced, giving the possibility to the customers and/or truck drivers to book a slot for trucks arrival.

MCC will rent a new, dedicated parking area in the logistic Centre, where the arriving trucks must check in. The trucks will wait there and will be called in to the terminal from this designated parking area, with the help of monitors and barrier system.

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).

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

All partners are convinced and agree that with the help of ACCESSMILE project and with the action plans defined, the transport flow can be optimized and automized, which will help improving the last mile accessibility of CE rural/peripheral areas to TEN-Ts through ICT. The topic no.1. is about transport flow management and vehicle booking systems.

With the help of project ACCESSMILE and the ICT development, including introduction and development of the VBS system, the ports and terminals will have the opportunity to avoid truck queues. With less idling vehicles less fuel will be consumed by the trucks, consequently less CO_2 will be released to the air, which will protect environment.

Participating Partners will make sure that the trucks are not standing in a queue with switched on engine after each other, but with – arriving at pre-booked slot – a smooth gate in and out process will have no unnecessary releasing CO to the air. The trucks will be called in when there is a slot for handling the

particular truck, avoiding congestion and CO pollution in front of the terminal. Reducing trucks' waiting in a queue will save use of fossil energy.

The problem with supplying the rural and peripheral areas are mainly with the allowed driving time of the truck drivers. According to the present rules, the driving time cannot exceed daily 9 hours (only in special cases and maximum twice per week).

With the present slow gate in and out process a truck with one driver can drive not more that 3-4 hours a day (including loading and unloading of the truck at the destination), so the truck and the truck driver must spend the night close to the destination at the rural and peripheral areas and the container can be returned to the port the next day only. This creates a competitive disadvantage to the rural and peripheral areas.

If the port/terminal can serve the trucks quicker, the outreach of the terminal can increase by 2-300kms on top of the current outreach, going further into the rural and peripheral areas.

With finalization of the action plans, the transport flow can be optimized, therefore the waiting time can be reduced, resulting in less environmental pollution and avoiding the competitive disadvantage of the rural and peripheral areas.