Project MILEPORT
Strategy for improving the last mile accessibility of Adriatic ports through ICT

Deliverable no. D.1.1.2

All partners – Joint contribution

Responsible partner – PP6 (RPA)

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Introduction

Activity 1.1 is devoted to jointly assessing the current situation on last mile accessibility of Italian and Croatian ports and elaborating a cross-border strategy to improve it.

As a first step, PPs analysed the status quo in this domain by assessing bottlenecks and market potential, including currently applied ICT tools.

PP6-PRA investigated good practices in the European and international context and carried out a comparative benchmarking study, assessing regions against each other, identifying which best practice could feed further project activities in a work paper.

Following that, PPs jointly drafted a strategy setting a vision, objectives and priorities aimed at the optimisation of transport flows and reduction of environmental externalities through IT tools, covering the two 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;

1. Methodology

1.1. Setting vision, mission, key values

In this chapter the vision statement, mission statement and key values are defined to provide a strategic framework for improving the last mile accessibility of Adriatic ports through IT tools.

1.1.1. LP1 - Port Network Authority of the Eastern Adriatic Sea

VISION
(Vision statement focuses on tomorrow and set the target aims to be achieved)
To steer the development of the port community by promoting technological innovation and boosting digital growth to improve the last mile accessibility of Adriatic ports through IT tools.
MISSION
(Mission statement focuses on today, what challenges shall we face towards the vision today)
To reach a strong coordination and information exchange in the port community, overcoming all problems in coordination, connectivity, interoperability of the last mile transportation.
Measure the effect of action already implemented to steer future improvement of ICTs tools as to further enhance the last mile accessibility of Adriatic Ports.
KEY VALUES
(The principles and values that are the basis of the vision of the strategy)
The neutrality guaranteed by the port's IT systems improves trust among logistic operators.
The use of open-source software ensures competitive development and maintenance costs.
Interoperability among public and private IT platforms avoids the need for developing a completely new IT system.
Use of common standards allows a smooth interaction among different IT systems.
ICT tools can improve both the efficiency and the environmental impact of last mile transportation.

1.1.2. PP2 - North Adriatic Sea Port Authority - Ports of Venice and Chioggia

VISION
(Vision statement focuses on tomorrow and set the target aims to be achieved)
The aim is developing a long-term plan, which can be implemented in subsequent steps, in order to have complete coverage of road traffic monitoring, integrated with Customs clearance data and information available from other bodies (such as the terminals, motorways, local/regional traffic providers), and have a first release of the prototype of a single information system with functions capable of collecting and displaying traffic data in real-time in the port area of Venice and Chioggia.
To achieve such a goal NASPA will work to improve both the traffic monitoring tools outside and at port gates, in particular from highway to port and on the port gates themselves to extend the digitalization already in place to all the freight.
Port gates are no longer an obstacle to a seamless flow of goods leaving or entering the port from/to the landside: when a truck transits through the port gate, there is no need for it to stop and exhibit paperwork (not even a QR code on a phone) to the people manning the check posts, and vehicles do not form any queue.
This is possible because every truck movement is arranged beforehand, and all the relevant information is exchanged and updated in real-time among the stakeholders. When the truck or train car approaches the gate, cameras (with the help of AI software) identify who are coming, what they are transporting, where they are going to and, most importantly, check if they are authorised to transit.
Cameras and SW also keep track of the traffic just outside the port, allowing to send real-time alerts to road hauliers if a congestion arises, and to accurately measure transit times from the last inbound mile to the terminal gate (as well as from the terminal gate to the port gate, for outbound traffic).
MISSION
(Mission statement focuses on today, what challenges shall we face towards the vision today)

The aim is to create a tool for monitoring of last mile road traffic affecting the port area, for operational and planning purposes. The tool will include the recovery of traffic data through integration with systems already in use (in the port and in other managing bodies, e.g. motorways, Customs Agency), as well as the development of an application front-end for internal and external users.

Currently, the main obstacles to a seamless flow of trucks carrying freight through the port gates are that it is impossible to automatically:

- (in the case of imports) double-check that the ID number of a container getting out of the port is the same as the ID number of a container announced by the terminal as leaving;

- (exports) send alert to road hauliers when traffic congestion forms, and to measure the transit times from the last inbound mile to the terminal gate;

- (exports) read (and thus, share with the customs agency and the relevant terminal) the ID number of a container arriving at the gate.

Moreover, the lanes at the port gates are too narrow to allow the installation of ordinary cameras and OCR software, but thanks to specialist AI tools, it is now possible to correctly read the container ID number even from disadvantaged positions.

KEY VALUES
(The principles and values that are the basis of the vision of the strategy)

1. Smoothing the movement of trucks.

2. Accelerating gate-in procedures at the container terminals.

3. Alleviating encumbrances to drivers.

4. Reducing greenhouse gases emissions due to trucks queueing.

1.1.3. PP3 - Port of Ravenna Authority

VISION
(Vision statement focuses on tomorrow and set the target aims to be achieved)
Implement an IT system that help to achieve the following objectives: • Receiving in advance the data of drivers and arriving vehicles;   • Request for access and verification of pre-authorisation for access of people to the dock issued by AdSP, (also through the use of a smartphone application)   • Receive in advance information on the arrival of external personnel and/or vehicles at the terminal;   • Changes to the access roads to the port, to facilitate the entry and exit of vehicles;   • Possibility of sending communications to the drivers of arriving vehicles through a device / smartphone application in case of delays / emergencies / information on traffic flows and roads;   • Use rest and parking areas outside the port area, to be reported in advance to the drivers.
MISSION
(Mission statement focuses on today, what challenges shall we face towards the vision today)
All the road transports arriving at or exiting from the port are managed directly by each singular terminal each of them following their own rules and procedures. The result is a big fragmentation of procedures that aren't homogeneous generating confusion and inefficiencies.   For the most active terminals and depending on the general level of road traffic, there can be serious congestions that entail long waits for drivers and dangerous situations along the road.
KEY VALUES
(The principles and values that are the basis of the vision of the strategy)

- Standardization

- Improvement of efficiency

- Data collection

- Dematerialization of documents

- Environmental and safety improvement

1.1.4. PP4 - Central Adriatic Ports Authority

VISION
(Vision statement focuses on tomorrow and set the target aims to be achieved)
Ensuring the full digitalization and interoperability between the IT systems of ADSPMAC devoted to the logistics data and to the management and control of vehicular traffic flows and container movements in the port areas (PCS, Hyperion) and the IT systems of the main public and private operators in charge of security, customs control, maritime traffic, road and rail infrastructures traffic, to improve the integration of the Motorways of the Sea in the wider logistics chains and smooth the connections between the different transport modes.
MISSION
(Mission statement focuses on today, what challenges shall we face towards the vision today)
The mission of ADSPMAC is to reach the full operability of the Hyperion system, the Artificial Intelligent system currently allowing the tracking and tracing of vehicles in the port areas, and ensure its interoperability with the AIDA system of the National Customs Agency to allow the digitalization of customs procedures.
Moreover, the mission of ADSPMAC is to promote the dialogue between the Hyperion system with the Port Community System and the IT systems of the road and rail operators, to ensure an efficient and seamless environment for the freight flows in transit in the Motorways of the Sea gateway of the port of Ancona.
KEY VALUES
(The principles and values that are the basis of the vision of the strategy)
- Digitalization: the digitalization of an increasing number of functions along the maritime transport chain paves the way for a smoother and more efficient freight transit, contributing to boost the role of the maritime transport as most efficient way of transport;   - Environmental sustainability: all improvements in the maritime transport and in the interconnection with the other modes of transport along the logistics chains should be based on the assumption of reducing the environmental impact of maritime transport and contributing to reach the Green Deal targets;

- Resilience and cybersecurity: the improvement of the last mile accessibility relies on the extensive use of IT systems able to ensure an open environment for the exchange of sensible data, thus reducing the fragmentation on the transport and logistic chains. It derives that the networks and the IT systems must be able to safely manage important amount of sensible data and afford possible external threats that may endanger the operativity of the systems

1.1.5. PP5 - Southern Adriatic Sea Port Authority (Ports Of Bari, Brindisi, Manfredonia, Barletta And Monopoli)

VISION
(Vision statement focuses on tomorrow and set the target aims to be achieved)
The port and logistics system can and must be a fundamental contributor to the country's economic recovery, an active instrument of Euro-Mediterranean policy and a lynchpin of cohesion policy and growth in the southern Italy. A guarantee and driving force behind the promotion of sustainability.
MISSION
(Mission statement focuses on today, what challenges shall we face towards the vision today)
As is well known, Italy, and to a lesser extent the Apulia region, is a highly specialised industrial and food processing economy, importing raw materials and industrial semi-finished products, transforming them into finished products and distributing them on the domestic market, and/or exporting them abroad using the logistic-distribution chains of the large players in the sector. In the case of partner ADSPMAM, which in its system includes six ports covering a very long area over two regions, Apulia and Molise, the dynamic physical flows of goods in transit in the ports reflects a substantially positive long-term trend, but one that must tend to increasingly increase the efficiency of the ports in terms of infrastructure, IT and roads. Strategies that, if implemented, can also have important consequences on the Italian and cross-border production system from various points of view, starting with the reduction of transport times and costs and therefore the transit of goods, vehicles and people.
KEY VALUES
(The principles and values that are the basis of the vision of the strategy)
Establish transit hubs for flows of goods and people to and from the countries on the Adriatic side, an objective that takes on a strategic dimension.

1.1.6. PP6 - Port of Rijeka Authority

VISION (Vision statement focuses on tomorrow and set the target aims to be achieved)
To achieve an enhanced level of multimodality through the development of superior infrastructure, advanced ICT solutions, and a high degree of collaboration across all segments of the multimodal transportation chain.
MISSION (Mission statement focuses on today, what challenges shall we face towards the vision today)
To attain a robust, enduring multimodality at the Port of Rijeka by adopting comprehensive measures including greater stakeholder engagement, effective management of carbon emissions and waste, fostering regional innovation networks, alongside collaborative planning and the enhancement of port technology and infrastructure.
KEY VALUES (The principles and values that are the basis of the vision of the strategy)
Commitment to sustainable multimodality, continuous modernization, and improved energy efficiency as fundamental principles guiding our operations and strategic decisions.

1.1.7. PP7 - Port of Zadar Authority

VISION **(Vision statement focuses on tomorrow and set the target aims to be achieved)**
Improvement of last mile accessibility by implementing port management system (ICT) in ZPA along with supplemental data feed/input systems and proper interconnections/output for other traffic/transportation/authority systems on local/regional/state levels enabling both operational and strategic managing.
MISSION **(Mission statement focuses on today, what challenges shall we face towards the vision today)**
Implementation of adequate port management system (ICT) enabling interoperability with other stakeholder's ICT systems (Terminal Operators/Concessionaires, Customs, Maritime Police, Harbour Master Office, Port Agents/Freight Forwarders, Ship Supply Agencies, Shippers) and implementation of data/feed input system(s).
KEY VALUES **(The principles and values that are the basis of the vision of the strategy)**
Use of common standards allowing interoperability/interconnectivity between different stakeholder's I(C)T systems. interoperability/interconnectivity between different stakeholder's I(C)T systems can improve both efficiency and environmental impact of last mile transportation.

1.1.8. PP8 - Port of Ploče Authority

VISION
(Vision statement focuses on tomorrow and set the target aims to be achieved)
To achieve an enhanced level of multimodality through the development of superior port infrastructure, advanced ICT solutions in addition to the application of modern technologies, and a high degree of collaboration across all segments of the multimodal transportation chain.
MISSION
(Mission statement focuses on today, what challenges shall we face towards the vision today)
Achieving strong and permanent multimodality in the port of Ploče by adopting comprehensive measures that will include greater engagement of port concessionaires and stakeholders with focus on creating and securing conditions for efficient management of maritime and public property, effective and comprehensive management of carbon dioxide emissions and waste, encouraging regional innovation networks with joint planning and improvement of port technology and infrastructure by creating preconditions for the transformation of the port from a transshipment port to a regional logistics center in which, in addition to the application of modern technologies, various distribution and additional services will be provided on goods that run through the port.
KEY VALUES
(The principles and values that are the basis of the vision of the strategy)
Commitment to sustainable multimodality, continuous modernization, and improved energy efficiency as fundamental principles guiding our operations and strategic decisions.

1.2. Setting strategic objectives and priorities

This chapter describes the strategic goals that Ports want to achieve in the domain of <u>improving the last mile accessibility through IT tools</u> in the fields:

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

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

in the medium (5 years) and long term (10 years).

1.2.1. LP1 - Port Network Authority of the Eastern Adriatic Sea

The strategic goals PNAEAS wants to achieve in the domain of <u>improving the last mile accessibility through IT tools</u> are defined as follows:

Medium term (5 years):

1. topic no. 1 (VBS)

    a. Goal no. 1 - Pre-exit notification

    b. Goal no. 2 - Slot management system

    c. Goal no. 3 – Laser scanners at gates

2. topic no. 2 (gates)

    a. Goal no. 4 – Port Community System (PCS) integration with gates

Long term (10 years):

1. topic no. 1 (VBS)

    a. Goal no. 5 – e-CMR

Perspectives	Goal #1 – Pre-exit notification	Measurement
1. Environmental and safety perspective	A new PCS procedure allowing to track the exit of vehicles (from disembarkation to gate-out); also integrate the exit direction in the	All port systems by law must prepare yearly a comprehensive document (Environmental Energy Planning Documents of

	port's procedures; simplify the operation at the gate (and standardise with respect to port tracking at entry); simplify associated customs procedures. This will reduce the time spent at terminals' gates and reduce the related environmental impact, at the same time improving the last mile accessibility	the Port Systems DEASP) measuring in detail the carbon footprint of all port activities
2. Internal processes perspectives	The processes and procedures of the port authority and terminal operators will be harmonized to become a common set of rules	Reduction of number of rules and procedures managed in different ways in the two ports
3. Innovation and growth perspective	Increased efficiency should lead to a better growth for the port community including shippers and logistic operators	Statistics for the two ports
4. Customer / Partner perspective	Transparency portals on website communicate promptly any change in procedures to stakeholders	Yearly satisfaction survey is distributed to stakeholders
5. Financial perspective	Funds from European Projects can help Port System Authority in financing activities toward this goal	Number of EU projects focused on this goal

VISION:
To steer the development of the port community by promoting technological innovation and boosting digital growth to improve the last mile accessibility of Adriatic ports through IT tools.

Perspectives	Goal #2 – Slot management system	Measurement
1. Environmental and safety perspective	A new PCS procedure to allow the carrier to present himself at the relevant unloading terminal to collect the container, within a previously defined time window. The container to be collected must therefore be unrestricted and the module must interface with the other modules used to control the goods in the container and, in particular, with the "unloading fees" module. This will reduce the time spent at terminals' gates and reduce the related environmental impact, at the same time improving the last mile accessibility of shippers and logistic operators	All port systems by law must prepare yearly a comprehensive document (Environmental Energy Planning Documents of the Port Systems DEASP) measuring in detail the carbon footprint of all port activities
2. Internal processes perspectives	The processes and procedures of the port authority and terminal operators will be harmonized to become a common set of rules	Reduction of number of rules and procedures managed in different ways in the two ports
3. Innovation and growth perspective	Increased efficiency should lead to a better growth for the port community including shippers and logistic operators	Statistics for the two ports
4. Customer / Partner perspective	Transparency portals on website communicate promptly any change in procedures to stakeholders	Yearly satisfaction survey is distributed to stakeholders

| 5. Financial perspective | Funds from European Projects can help Port System Authority in financing activities toward this goal | Number of EU projects focused on this goal |

| **VISION:**
To steer the development of the port community by promoting technological innovation and boosting digital growth to improve the last mile accessibility of Adriatic ports through IT tools. | | |

Perspectives	**Goal #3 - Laser scanners at gates**	**Measurement**
1. Environmental and safety perspective	Installing sensors (laser scanners) at the gates will allow to differentiate port access policies according to the type of cargo (container or semitrailer), eliminating bottlenecks at the port gates, thus improving the port-city interface at the same time its environmental impact. The information gathered by the sensors, will be useful to validate the positive effects of previous action developed and steer future improvement of ICTs tools as to further enhance the last mile accessibility of Adriatic Ports	All port systems by law must prepare yearly a comprehensive document (Environmental Energy Planning Documents of the Port Systems DEASP) measuring in detail the carbon footprint of all port activities.
2. Internal processes perspectives	The processes and procedures of the port authority and terminal operators will be harmonized to become a common set of rules.	Reduction of number of rules and procedures managed in different ways in the two ports

3. Innovation and growth perspective	Increased efficiency should lead to a better growth for the port community including shippers and logistic operators	Statistics for the two ports
4. Customer / Partner perspective	Transparency portals on website communicate promptly any change in procedures to stakeholders	Yearly satisfaction survey is distributed to stakeholders
5. Financial perspective	Funds from European Projects can help Port System Authority in financing activities toward this goal	Number of EU projects focused on this goal

VISION:
To steer the development of the port community by promoting technological innovation and boosting digital growth to improve the last mile accessibility of Adriatic ports through IT tools.

Perspectives	Goal #4 – PCS integration with gates	Measurement
1. Environmental and safety perspective	Integrate the data declared in Sinfomar (logistics data) with the data collected at the roadside checkpoints. This will reduce the time spent at terminals' gates and reduce the related environmental impact, at the same time improving the last mile accessibility	All port systems by law must prepare yearly a comprehensive document (Environmental Energy Planning Documents of the Port Systems DEASP) measuring in detail the carbon footprint of all port activities.
2. Internal processes perspectives	The processes and procedures of the port authority, terminal operators, Customs Agency,	Reduction of number of rules and procedures managed in different ways in the two ports.

Perspectives		Measurement
	Finance police and police, shippers and logistic will be harmonized to become a common set of rules	
3. Innovation and growth perspective	Increased efficiency should lead to a better growth for the port community including shippers and logistic operators	Statistics for the two ports.
4. Customer / Partner perspective	Transparency portals on website communicate promptly any change in procedures to stakeholders	Yearly satisfaction survey is distributed to stakeholders.
5. Financial perspective	Funds from European Projects can help Port System Authority in financing activities toward this goal	Number of EU projects focused on this goal.

VISION:
To steer the development of the port community by promoting technological innovation and boosting digital growth to improve the last mile accessibility of Adriatic ports through IT tools.

Perspectives	Goal #5 – e-CMR	Measurement
1. Environmental and safety perspective	A new PCS procedure capable of managing the data contained in the electronic CMR and associating them with the data already present in the other Sinfomar modules, with the possibility of exchanging them	All port systems by law must prepare yearly a comprehensive document (Environmental Energy Planning Documents of the Port Systems DEASP) measuring in detail the carbon footprint of all port activities.

	with Custom Agency and Finance Police through interoperability. This will reduce the time spent at terminals' gates and reduce the related environmental impact, at the same time improving the last mile accessibility	
2. Internal processes perspectives	The processes and procedures of the port authority, terminal operators, Customs Agency, Finance police and police, shippers and logistic operators will be harmonized to become a common set of rules	Reduction of number of rules and procedures managed in different ways in the two ports.
3. Innovation and growth perspective	Increased efficiency should lead to a better growth for the port community including shippers and logistic operators	Statistics for the two ports.
4. Customer / Partner perspective	Transparency portals on website communicate promptly any change in procedures to stakeholders	Yearly satisfaction survey is distributed to stakeholders
5. Financial perspective	Funds from European Projects can help Port System Authority in financing activities toward this goal	Number of EU projects focused on this goal

VISION:
To steer the development of the port community by promoting technological innovation and boosting digital growth to improve the last mile accessibility of Adriatic ports through IT tools.

1.2.2. PP2 - North Adriatic Sea Port Authority - Ports of Venice and Chioggia

The strategic goals NASPA wants to achieve in the domain of <u>improving the last mile accessibility through IT tools</u> are defined as follows:

Medium term (5 years):

1. topic no. 2 (gates)

   a. Goal no. 1 - Installing and setting up cameras that, with the appropriate software, are able to correctly read the container ID number (and, possibly, also the vehicle plate) even under disadvantaged circumstances (bad position; bad visibility) and feed the PCS and its data-exchange module.

Long term (10 years):

1. topic no. 2 (gates)

   a. Goal no. 2 - Getting 99.99% of correct data (no errors) read from container and vehicle.

Topic no. 2 (gates) – Goal no. 1 "Cameras and appropriate software"

Perspectives	Goal	Measurement
1. Environmental and safety perspective	Monitoring queues to/from the port gates to abate the emissions due to trucks queueing	Time to cover the last mile (from the road leading to the port gate, all the way to the terminal gates)
2. Internal processes perspectives	Trucks are encouraged to announce/book their arrival; road hauliers are real-time informed when congestion arises	Average time (in seconds) for a truck to transit through the in/out gates
3. Innovation and growth perspective	The correspondence of document information and the physical transit of trucks and freight is automatically verified	Implementation (Y/N) of the automatic clearance for trucks carrying: - containers (import);

		- containers (export); - bulk (import); - general cargo (import).
4. Customer / Partner perspective	The port gate is no longer a barrier where trucks have to stop and wait if the all the relevant documents are compliant to the law	Percentage of trucks coming at the port gates with a match between information provided and real plate/container id.
5. Financial perspective	Funds come from MILEPORT Project, as well as from other grants, e.g. Italian PNRR (National Recovery and Resilience Plan)	Number of: - cameras; - software licences bought.

VISION:

Port gates are no longer an obstacle to a seamless flow of goods leaving or entering the port from/to the landside: when a truck transits through the port gate, there is no need for it to stop and exhibit paperwork (not even a QR code on a phone) to the people manning the check posts, and vehicles do not form any queue.

Topic no. 2 (gates) – Goal no. 2 "Cameras and appropriate software"

Perspectives	Goal	Measurement
1. Environmental and safety perspective	Prevention of queues to/from the port gates to abate the emissions due to trucks queueing	Time to cover the last mile (from the road leading to the port gate, all the way to the terminal gates)
2. Internal processes perspectives	All trucks announce/book their arrival; no congestion ever arises	Average time (in seconds) for a lorry to transit through the in/out gates
3. Innovation and growth perspective	The correspondence of document information and the	Implementation (Y/N) of the automatic clearance for trucks carrying:

	physical transit of trucks and freight is automatically verified	- containers (import); - containers (export); - bulk (import); general cargo (import).
4. Customer / Partner perspective	The port gate is no longer a barrier where trucks have to stop and wait if the all the relevant documents are compliant to the law	Percentage of trucks coming at the port gates with a match between information provided and real plate/container id.
5. Financial perspective	Funds for maintenance and upgrades are paid for with internal resources.	Number of: - cameras; - software licences bought.

VISION:

Port gates are no longer an obstacle to a seamless flow of goods leaving or entering the port from/to the landside: when a truck transits through the port gate, there is no need for it to stop and exhibit paperwork (not even a QR code on a phone) to the people manning the check posts, and vehicles do not form any queue.

1.2.3. PP3 - Port of Ravenna Authority

The strategic goals Port of Ravenna Authority wants to achieve in the domain of <u>improving the last mile accessibility through IT tools</u> are defined as follows:

Medium term (5 years):

1. topic no. 1 (VBS)

    a) Goal no. 1- implement a vehicle booking system for the port

    b) Goal no. 2 - develop a mobile app supporting the VBS as well as other services helpful for the truck drivers

2. topic no. 2 (gates) -:

    a) Goal no. 3 - install 7 virtual gates along the roads that give access to the port area

    b) Goal no. 4 - implement a data lake for the collection of data related to the road transport

    c) Goal no. 5 - implement the tracking of the goods in the port area

Perspectives	Goal	Measurement
1. Environmental and safety perspective	Goals no. 1, 2 Reduction of waiting time at terminal gates Goals no. 3, ,4 ,5 Improved awareness about the footprint of road transport directly related to the port operations	• Percentage of reduction of waiting time at terminal gates • Number of virtual gates developed
2. Internal processes perspectives	Goals no. 1, 2 Improved efficiency for the road transport	• Number of new services implemented • Number of virtual gates developed

	Improved quality of the connection between port and truck companies Goals no. 3, 4, 5 Improved awareness on the traffic of vehicles in the port area Improved tracking of vehicles Acquiring of data to support the decision-making system	
3. Innovation and growth perspective	Goals no. 1, 2 The new mobile app will be the way to establish a bidirectional communication between port and drivers The dematerialization of transport documents will improve the reliability and effectiveness of transport of goods Goals no. 3, 4, 5 The use of advanced algorithms for the identification, classification and tracking of vehicles will improve the accuracy of the entire system	• Number of mobile app users • Percentage of documents dematerialized • Percentage of success for identification and classification of vehicles
4. Customer / Partner perspective	All goals The achievement requires a big effort for the active engagement of terminals, freight forwarders and truck companies.	• Number of terminals connected to the system • Number of freight forwarders using the system

	We plan to realize workshops, face-to-face meeting and co-projecting sessions.	• Number of truck companies connected to the system • Percentage of reservations of vehicles entering the terminals for internal services compared to the number of vehicles transiting through the virtual gates
5. Financial perspective	Goals no. 1, 2 The achievement is financed partially by the MILEPORT project and partially by the national founds for the PCS developments Goals no. 3 ,4, 5 The achievement is co-financed by the CEF programme	• Number of new services financed • Number of virtual gates financed

VISION:

To Implement an IT system that help to achieve the following objectives:

- Receiving in advance the data of drivers and arriving vehicles;

- Request for access and verification of pre-authorisation for access of people to the dock issued by AdSP, (also through the use of a smartphone application)

- Receive in advance information on the arrival of external personnel and/or vehicles at the terminal;

- Changes to the access roads to the port, to facilitate the entry and exit of vehicles;

- Possibility of sending communications to the drivers of arriving vehicles through a device / smartphone application in case of delays / emergencies / information on traffic flows and roads;

Use rest and parking areas outside the port area, to be reported in advance to the drivers.

1.2.4. PP4 - Central Adriatic Ports Authority

The strategic goals Central Adriatic Ports Authority wants to achieve in the domain of <u>improving the last mile accessibility through IT tools</u> are defined as follows:

Medium term (5 years):

1. topic no. 2 (gates)

   a.   Goal no. 1 - full interoperability between the PCS, the Artificial Intelligent System, the AIDA system and the IT systems of rail and road infrastructure

Long term (10 years):

1. topic no. 2 (gates)

   a.   Goal no. 2 - improving the integration in the Adriatic-Ionian MOS through increased efficiency and rationalization of maritime procedures and last mile connections in the port of Ancona

Perspectives	Goal n.1: full interoperability between the IT systems	Measurement
1. Environmental and safety perspective	Develop actions to achieve the interoperability between the IT systems of ADSPMAC, namely the PCS (statistic and logistics data) and the Artificial Intelligent system (Hyperion) for the tracing of trucks movements of at the gates, with external IT systems: the AIDA system of National Customs Agency for the digitalization of customs procedures, and the IT systems of rail and road infrastructure to share information of traffic flows.	- Reduction of km travelled by trucks in the port areas; - Reduction of waiting time at the gates

	This will optimize the trucks movements in the port areas, reduce the time spent at terminals' gates and reduce the related environmental impact	
2. Internal processes perspectives	Harmonization of procedures between ADSPMAC, the Customs officers, the Harbour Master, the Border Police, the Financial Police and the private operators such as freight forwarders and maritime agencies	- Reduction of the number of regulations and procedures among all the actors involved; - Reduction of the number of disruptions in the implementation of procedures - Availability of the same information in different IT system (Once principle)
3. Innovation and growth perspective	Promotion of the digitalization of processes in synergy with the control and security bodies involved and with private operators	- Number of new processes digitalized;
4. Customer / Partner perspective	Optimization of the typology and quantity of data to enter in the IT systems, realization of training courses, implementation of user-friendly and efficient applications	- Satisfaction feedbacks by private operators
5. Financial perspective	Application to national and European sources of fundings such ask the RFF funds, CEF programme and European Territorial Cooperation programmes	- Number of new projects approved for funding;

VISION:

Ensuring the full digitalization and interoperability between the IT systems of ADSPMAC devoted to the logistics data and to the management and control of vehicular traffic flows and container movements in the port areas (PCS, Hyperion) and the IT systems of the main public and private operators in charge of security, customs control, maritime traffic, road and rail infrastructures traffic, to improve the integration of the Motorways of the Sea in the wider logistics chains and smooth the connections between the different transport modes.

Perspectives	Goal n.2: increased efficiency and rationalization of maritime procedures and last mile connections in the port of Ancona	Measurement
1. Environmental and safety perspective	Develop actions to achieve the smoothness and efficiency of maritime procedures and last mile connections at the port of Ancona	- Reduction of waiting time at the gates; - Increased share of SSS in the port of Ancona
2. Internal processes perspectives	Improved organization and harmonization of procedures between ADSPMAC and all operators, private and public, involved in the modal shift operations	- Reduction of the number of regulations and procedures among all the actors involved; - Reduction of the number of disruptions in the implementation of procedures - Availability of the same information in different IT system (Once principle)

3. Innovation and growth perspective ⬇	Promotion of the digitalization of processes in synergy with the control and security bodies involved and with private operators	- Number of new processes digitalized;
4. Customer / Partner perspective ⬇	Optimization of the maritime formal procedures and easiness of the last mile connections for private operators	- Satisfaction feedbacks by private operators
5. Financial perspective ⬇	Application to national and European sources of fundings such ask the RFF funds, CEF programme and European Territorial Cooperation programmes	- Number of new projects approved for funding;

VISION:

Ensuring the full digitalization and interoperability between the IT systems of ADSPMAC devoted to the logistics data and to the management and control of vehicular traffic flows and container movements in the port areas (PCS, Hyperion) and the IT systems of the main public and private operators in charge of security, customs control, maritime traffic, road and rail infrastructures traffic, to improve the integration of the Motorways of the Sea in the wider logistics chains and smooth the connections between the different transport modes.

1.2.5. PP5 - Southern Adriatic Sea Port Authority (Ports Of Bari, Brindisi, Manfredonia, Barletta And Monopoli)

The strategic goals Southern Adriatic Sea Port Authority wants to achieve in the domain of <u>improving the last mile accessibility through IT tools</u> are defined as follows:

Medium term (5 years):

1. topic no. 2 (gates)

   a.   Goal no. 1:

   Ports are open infrastructures whose security is influenced by numerous parameters, such as the flows of people and vehicles.

   The movement of these flows must be carefully monitored and controlled to ensure proper security management (through the GAIA PCS). Security management must inevitably utilise integrated access control systems to ensure that flows are properly organised.

   Port gateways are the 'gateway' through which last-mile road flows pass, the productivity of which plays an important role in the overall efficiency of the port and the port-city relationship, due to problems such as congestion and air pollution that could occur if they fail to function.

   This investment is necessary to make the traffic of freight vehicles passing through the ports managed by PP5 smoother and faster.

   The investment consists of the installation of 10 automated vehicle control solutions for the control of vehicles at the PP5 port gates (Ports of Bari, Brindisi, Manfredonia, Barletta, Monopoli and Termoli).

   The IT solution has to be equipped with software capable of dialoguing with the GAIA PCS to ensure a rapid response to the high flows of people and vehicles, with a load balancing mechanism of the server farm itself, based on a genetic controller, to guarantee optimum operating speed and performance.

   Each automated gate control system must consist of at least:

   - OCR camera, for reading vehicle number plates;

   - QR code / RFID card reader, to obtain access authorisation information for GAIA;

- voice communication system, to obtain support from port security operators;

- integrated barrier, to allow or deny access to the gate;

- gate application system;

- interoperability system (on CED site / on Cloud), to obtain and send data to the GAIA PCS.

The exact number/type of equipment will be decided with the other PPs in the co-design phase and according to market conditions at the time of implementation.

Long term (10 years):

1. topic no. 2 (gates)

    a. Goal no. 2:
    ADSPMAM has invested in the digitisation of logistics processes, also taking advantage of the opportunities of European projects. Now the Port Authority must combine digitalisation and sustainability to build a resilient port and logistics hub capable of facing the sector's new challenges, and therefore fit into this context of changing global scenarios that, as recent events have shown, must be ready to face new challenges with resilience, dynamism, and the ability to transform needs into opportunities for growth and development for the port community.

Perspectives	Goal no. 1, 2	Measurement
1. Environmental and safety perspective	the investment will have positive effects on the environment, as road traffic flows will be streamlined, reducing congestion on city streets and air pollution	reduction traffic congestion and Co2
2. Internal processes perspectives	This investment is necessary to make the traffic of freight vehicles passing through the ports	better traffic management and control within ports

	managed by Adspmam smoother and faster. The handling of these flows must be carefully checked and controlled to ensure proper safety management (through the GAIA PCS).	
3. Innovation and growth perspective	The pilot investment aims to improve the performance of port gates, allowing faster entry/exit of trucks into ports, increasing their overall efficiency and reducing negative impacts at the port-city interface in terms of congestion and air quality.	Upgrade of Port community system
4. Customer / Partner perspective	The entire port community can benefit, i.e. all port stakeholders, both the operators and the governing bodies of the region.	reducing waiting times for drivers and port and government operators
5. Financial perspective	as these types of investments improve transit conditions, contain environmental impacts and increase the mobility of flows in the region and thus welfare.	improving and increasing the flow of vehicles, passengers and goods

VISION:
The port and logistics system can and must be a fundamental contributor to the country's economic recovery, an active instrument of Euro-Mediterranean policy and a lynchpin of cohesion policy and growth in the Southern Italy. A guarantee and driving force behind the promotion of sustainability.

1.2.6. PP6 - Port of Rijeka Authority

The strategic goals Port of Rijeka Authority wants to achieve in the domain of <u>improving the last mile accessibility through IT tools</u> are defined as follows:

Medium term (5 years):

1. topic no. 1 (VBS) – Goal no. 1

2. topic no. 2 (gates) - Goal no. 2:

Long term (10 years):

1. topic no. 1 (VBS) – Goal no. 4

2. topic no. 2 (gates) - Goal no. 5:

Perspectives	Goal	Measurement
1. Environmental and safety perspective	• Monitoring the state of environment • Setting up the environmental (carbon) management • Preparation of Ship Waste Management Plan and its harmonization with Energy Development Strategy of the Republic of Croatia until 2030 with a view to 2050	• Modernization of lighting • Purchasing of e-vehicle • Construction of a connection for the electric charging stations • Energy consumption monitoring system • Construction of onshore power system (OPS system) • Onshore PV panels • Limitation of speed for ships in the port vicinity • Energy renovation of buildings

		• Use of alternative energy sources in land transport and machinery operation
		• Education of employees in the field of sustainability and energy efficiency
		• Application of noise reduction technologies
2. Internal processes perspectives	• Speeding up internal administrative procedures • Improving activities in the direction of green business • Internal regulations in the procedures for the implementation of measures (approval, consent, opinion)	• Improvement of internal Portonus system • Modernization of PCS system • Improvement of access control system • Further digitalization of VHF system
3. Innovation and growth perspective	• Enhancing the cross-sectoral cooperation • Integration of transport sector into the social and economic development of the region • Improvement of rail freight connections • Improvement the safety of a road system • Improve the development and competitiveness of the	• Development of main logistic centres • Integration the international/national transport system with the local/regional transport system • Better utilization of the Croatian railway system in the main Croatian agglomerations • Increasing the road accessibility of areas, where

	Port of Rijeka as the main maritime port	the existing infrastructure reached the capacity limits and alternative modes (rail, maritime PT) are not economically justifiable (touristic centres in Adriatic Dalmatia) including the introduction of a sustainable traffic concept in favour of PT and zero emission modes
		• Improvement of the Modal Split of freight transport across the Adriatic Sea or along the coastline in favour of maritime transport
		• Better integration of the ports into the local transport system (passenger/freight)
		• The co-design and implementation of a mobile application for Android and iOS platforms to enable users to announce truck arrivals and check cargo availability
4. Customer / Partner perspective	• Harbour Master's Office • Ministry of Sea, Transport and Infrastructure	• Inspection of maritime safety • Harmonization of administrative procedures

	• Ministry of Interior • Croatian Railway – Infrastructure • Port of Rijeka Plc. • AGCT Ltd. • Port service concessionaires • Ship owners • Ship agents • Freight agents • Truck carriers • Croatian Railway Cargo Ltd. • PPD Transport Ltd.	• Optimization of terminal efficiency • Modernization of infrastructure and procedures • Systematic promotion model • Port and operations security assessment and oversight
5. Financial perspective	• Ministry of Finance • EU sources of funding • Involvement of public-private partnership	• Participation in the Environmental Protection and Energy Efficiency Fund projects • Participation in Connecting Europe Facility projects • Participation in projects funded by Cohesion Fund • Participation in projects funded by the European Regional Development fund, especially INTERREGs

		• Participation in The European Fund for Strategic Investments projects
		• Participation in financial support from the European Investment Bank
		• Participation in the European Energy Efficiency Fund projects
		• Participation in the InvestEU projects

VISION:

To achieve an enhanced level of multimodality through the development of superior infrastructure, advanced ICT solutions, and a high degree of collaboration across all segments of the multimodal transportation chain.

1.2.7. PP7 - Port of Zadar Authority

The strategic goals Port of Zadar Authority wants to achieve in the domain of <u>improving the last mile accessibility through IT tools</u> are defined as follows:

Medium term (5 years):

1. topic no. 1 (VBS)

    a. Goal no. 1 – Inbound traffic flow data acquisition

    b. Goal no. 2 – Outbound traffic flow data acquisition

Long term (10 years):

2. topic no. 1 (VBS)

    a. Goal no. 3 – Traffic flow management system implementation

Perspectives	Goal no. 1 – Inbound traffic flow data acquisition	Measurement
1. Environmental and safety perspective	Inbound traffic flow data acquisition will help determining better insight into inbound traffic structure – classification (vehicle categories), provide baseline for que management and therefore help reduce carbon emissions and provide baseline for concessionaires' (ferry) line optimization	Number of vehicles and their corresponding categories (can be derived as/measured in Personal Car Equivalent – PCE unit); PCE will provide baseline for CO_2 emissions calculation
2. Internal processes perspectives	Procedures for sharing inbound traffic flow data can be defined along with procedures for que management and $C0_2$ reduction	Implementation of new procedure(s) regarding port traffic flow management
3. Innovation and growth perspective	Providing inbound traffic flow data represents baseline for	Inbound traffic flow statistics

	development of various optimizations for both ZPA, shippers and authorities	
4. Customer / Partner perspective	Providing inbound traffic flow data for possible optimization(s) to all interested stakeholders (public authorities/private); Could be especially beneficial for national macroscopic traffic flow management	Yearly/seasonal traffic flow reports
5. Financial perspective	EU project funding can help ZPA in development of all components of port traffic management system	Number of EU projects

VISION:
Improvement of last mile accessibility by implementing port management system (ICT) in ZPA along with supplemental data feed/input systems and proper interconnections/output for other traffic/transportation/authority systems on local/regional/state levels enabling both operational and strategic managing.

Perspectives	Goal no. 2 – Outbound traffic flow data acquisition	Measurement
1. Environmental and safety perspective	Outbound traffic flow data acquisition will help determine better insight into outbound traffic structure – classification (vehicle categories)	Number of vehicles and their corresponding categories
2. Internal processes perspectives	Procedures for sharing outbound traffic data can be defined	Implementation of new procedure(s) regarding port traffic flow management

3. Innovation and growth perspective	Providing outbound traffic flow data represents baseline for development of various optimizations for both local/national traffic management related authorities and other stakeholders	Outbound traffic flow statistics
4. Customer / Partner perspective	Providing outbound traffic flow statistics for possible optimization(s) to all interested stakeholders (public authorities/private); Could be especially beneficial for national macroscopic traffic flow management	Yearly/seasonal traffic flow reports
5. Financial perspective	EU project funding can help ZPA in development of all components of port traffic management system	Number of EU projects

| **VISION:** |
| Improvement of last mile accessibility by implementing port management system (ICT) in ZPA along with supplemental data feed/input systems and proper interconnections/output for other traffic/transportation/authority systems on local/regional/state levels enabling both operational and strategic managing. |

Perspectives	Goal no. 3 – Traffic flow management system implementation	Measurement
1. Environmental and safety perspective	Traffic flow management system represents a baseline for any	Number of vehicles and their corresponding categories

	local/reginal/national traffic flow management policies/systems	
2. Internal processes perspectives	Procedures for sharing traffic flow data can be defined	Implementation of new procedure(s) regarding port traffic flow management
3. Innovation and growth perspective	Traffic flow data represents baseline for development of various optimizations for both local/national traffic management related authorities and other stakeholders	Traffic flow statistics
4. Customer / Partner perspective	Providing traffic flow data for possible optimization(s) to all interested stakeholders (public authorities/private); Especially beneficial for national macroscopic traffic flow management	Yearly/seasonal traffic flow reports
5. Financial perspective	EU project funding can help ZPA in development of all components of port traffic management system	Number of EU projects

VISION:
Improvement of last mile accessibility by implementing port management system (ICT) in ZPA along with supplemental data feed/input systems and proper interconnections/output for other traffic/transportation/authority systems on local/regional/state levels enabling both operational and strategic managing.

1.2.8. PP8 - Port of Ploče Authority

The strategic goals Port of Ploče Authority wants to achieve in the domain of <u>improving the last mile accessibility through IT tools</u> are defined as follows:

Medium term (5 years):

1. Topic no. 1 (Vehicle Booking Systems as integrated part of the PCS system which handle pre-arrival or pre-exit notification to enhance exchange of the information to port/terminal gates – Goal no. 1

2. Topic no. 2 (Port/terminal gates with enhanced interoperability based on the message exchange among public PCS and private IT systems) – Goal no. 2

3. Topic no. 3 (Standardization of the message exchange among public PCS and private IT systems through ESB or API)

Long term (10 years):

1. Topic no. 1 (Vehicle Booking Systems as integrated part of the PCS system which handle pre-arrival or pre-exit notification to enhance exchange of the information to port/terminal gates – Goal no. 1

2. Topic no. 2 (Port/terminal gates with enhanced interoperability based on the message exchange among public PCS and private IT systems) – Goal no. 2

Perspectives	Goal	Measurement
1. Environmental and safety perspective	- Monitoring the state of environment - Setting up the environmental (carbon) management - Preparation of Ship Waste Management Plan and its harmonization with Energy Development	- Modernization of lighting - Construction of a shore connection power system, Cold ironing - Energy consumption monitoring system - Solar panels - Energy renovation of buildings

MILEPORT	Strategy of the Republic of Croatia until 2030 with a view to 2050	• Education of employees in the field of sustainability and energy efficiency • Application of noise reduction technologies • Air quality monitoring, sensors and measuring stations • Etc.
2. Internal processes perspectives	• Speeding up internal administrative procedures • Improving activities in the direction of green business • Internal regulations in the procedures for the implementation of measures (approval, consent, opinion)	• ESB – Enterprise Service Bus upgrade and improvement • Improvement and modernization of PCS system • Integration with stakeholder's port systems through ESB • Improvement of system of technical and security protection, and access control • Cyber security • Port security • Digitalization of processes and procedures • CCTV System
3. Innovation and growth perspective	• Enhancing the cross-sectoral cooperation	• Creating and securing conditions for efficient

MILEPORT	• Integration of transport sector into the social and economic development of the region • Improvement of rail freight connections • Improvement of the road freight connections • Improvement the safety of a road system • Improvement the safety within the port • Exchange of electronical information with aim to provide better and paperless stakeholders communications • Improve the development and competitiveness of the port of Ploče as the main maritime port	management of maritime and public property • Creating preconditions for the transformation of the port from a transshipment port to a regional logistics center • distribution and additional services for the goods that run through the port • Development of main logistic centres and regional logistics center • Integration the international/national transport system Port Community System • Integration of the terminal operating systems with the Port Community System • Increasing the road accessibility of areas, where the existing infrastructure reached the capacity limits and alternative modes • Better integration of the stakeholders' systems into the Port Community System through ESB

4. Customer / Partner perspective	• Harbour Master's Office • Ministry of Sea, Transport and Infrastructure • Ministry of Interior • Croatian Railway – Infrastructure • Port of Ploče Ltd. • ATT Ltd. • NTF Ltd • TOP LOGISTICS Ltd. • Port service concessionaires • Ship owners • Ship agents • Freight agents • Truck carriers • Croatian Railway Cargo Ltd. • PPD Transport Ltd.	• Inspection of maritime safety • Harmonization of administrative procedures • Optimization of terminal efficiency • Modernization of infrastructure and procedures • Systematic promotion model • Port and operations security assessment and oversight
5. Financial perspective	• Ministry of Finance • EU sources of funding • Involvement of public-private partnership	• Participation in the Environmental Protection and Energy Efficiency Fund projects • Participation in Connecting Europe Facility projects • Participation in projects funded by Cohesion Fund • Participation in projects funded by the European

		Regional Development fund, especially INTERREGs
		• Participation in The European Fund for Strategic Investments projects
		• Participation in financial support from the European Investment Bank
		• Participation in the European Energy Efficiency Fund projects
		• Participation in the InvestEU projects

VISION:

To achieve an enhanced level of multimodality through the development of superior infrastructure, advanced ICT solutions, and a high degree of collaboration across all segments of the multimodal transportation chain.

2. Conclusion

Vision statements

The vision statements for the MILEPORT project focus on future goals and targets aimed at enhancing the efficiency and sustainability of last mile transportation through the use of ICT tools. The main vision statements are:

- Boosting digital growth and technological innovation
- Achieving environmental sustainability and reducing carbon footprints
- Ensuring a seamless supply chain and improving the flow of goods
- Enhancing the accessibility of rural and peripheral areas to TEN-T through ICT
- Providing high-level digitized services and promoting paperless administration
- Facilitating seamless electronic data flow and better use of infrastructure and resources
- Fostering multimodal, efficient, and sustainable logistics systems
- Enabling real-time communication and data sharing between different platforms
- Unifying operating systems and communication tools to prevent data leakages
- Increasing competitiveness and speeding up administrative and operative activities
- Enhancing cooperation among intermodal chain players
- Optimizing capacities and automating data transfer processes
- Promoting the modal shift towards more sustainable transportation modes
- Encouraging horizontal cooperation among stakeholders
- Improving port operations through advanced ICT solutions and collaboration
- Enhancing multimodality through superior infrastructure development
- Ensuring sustainable multimodality with continuous modernization and energy efficiency

Mission statements

The mission statements address the immediate challenges and actions required to achieve the vision. These include:

- Developing strong, interoperable, and coordinated multimodal transport systems
- Increasing the modal shift to sustainable transport modes
- Enhancing effective data sharing and reducing waiting times
- Eliminating inefficient procedures and adopting innovative approaches

- Improving stakeholder management and creating seamless IT tools
- Enabling real-time monitoring of vehicles and ensuring sustainability
- Limiting errors in data transmission and preventing consequent damages
- Facilitating possible extensions for Customs use and improving data accuracy
- Creating decision support systems for road transport
- Promoting information exchange between stakeholders through digitization
- Enhancing carbon and waste management practices
- Improving truck turn times and generating additional demand
- Developing human resources and responding to market needs
- Establishing platform federations and conducting market analyses
- Overcoming coordination, connectivity, and interoperability challenges in last mile transportation
- Measuring the effects of implemented actions to guide future improvements in ICT tools
- Enhancing the integration of Motorways of the Sea in broader logistics chains

Principles and key values

The principles and key values that form the foundation of the strategy include:

- Adoption of open-source development and use of standards
- Ensuring interoperability and connectivity among systems
- Prioritizing sustainability and environmental protection
- Emphasizing data security and reducing waiting times
- Modernizing logistics and enhancing the level of service
- Improving information exchange and increasing port safety and security
- Limiting cargo and container damages and reducing disputes about container status
- Ensuring accessibility, reliability, scalability, and flexibility
- Enhancing customer satisfaction and data accuracy
- Promoting paperless administration and better capacity utilization
- Investing in human resources and fostering respect, trust, and collaboration
- Utilizing common standards for smooth interaction among different IT systems
- Improving the environmental impact of last mile transportation
- Establishing transit hubs for goods and people flows

- Achieving efficient management of maritime and public property
- Encouraging regional innovation networks and collaborative planning.

Medium and long-term strategic goals and priorities
- Implement pre-exit notification systems to streamline vehicle exits, integrate exit directions, and simplify customs procedures, reducing terminal gate times and environmental impact
- Develop slot management systems within PCS to allow predefined time slots for container collection, minimizing time spent at gates and enhancing last mile accessibility
- Install advanced gate technologies, including sensors and cameras, to differentiate port access policies based on cargo type, ensuring smooth and efficient entry and exit processes
- Ensure full digitalization and interoperability between PCS and other IT systems, harmonizing data collection and reducing gate times and environmental impact
- Implement Vehicle Booking Systems (VBS) for pre-arrival notifications, enhancing information exchange at port and terminal gates
- Develop tools for monitoring last mile road traffic affecting port areas, integrating real-time data collection systems to optimize traffic flow
- Create mobile applications for truck arrival announcements and cargo availability checks, improving terminal activity notifications and traffic monitoring
- Enhance interoperability by standardizing message exchange among public PCS and private IT systems through ESB or API
- Manage electronic CMR (e-CMR) data to streamline gate procedures, ensuring interoperability with customs and police systems
- Combine digitalization and sustainability to build resilient port and logistics hubs capable of facing new challenges with dynamism and growth potential
- Implement comprehensive environmental management systems, including energy consumption monitoring, use of alternative energy sources, noise reduction technologies, and air quality monitoring
- Improve traffic flow data acquisition and management systems, including inbound and outbound traffic flow data acquisition and the implementation of traffic flow management systems
- Enhance the integration of IT systems for improved coordination and information exchange among stakeholders, including customs, maritime police, and harbor master offices

- Promote the digitalization of processes in synergy with control and security bodies and private operators
- Implement standardized and harmonized internal administrative procedures to enhance operational efficiency and green business practices
- Develop real-time monitoring and communication tools to reduce waiting times, optimize terminal efficiency, and improve safety within ports
- Utilize EU project funding and public-private partnerships to finance improvements in port infrastructure and ICT systems
- Improve the modal split of freight transport in favor of maritime transport, integrating ports into local and regional transport systems
- Enhance the development and competitiveness of ports as key maritime hubs through continuous modernization and energy-efficient practices
- Foster regional innovation networks and collaborative planning to improve port technology and infrastructure
- Establish and secure conditions for efficient management of maritime and public property, including the development of logistic centers and regional logistics hubs
- Ensure systematic promotion and oversight of port operations and security, harmonizing administrative procedures and optimizing terminal infrastructure

The strategy for improving last-mile accessibility of Adriatic ports through ICT is critical for enhancing the efficiency, sustainability, and competitiveness of the entire maritime transport chain. The comprehensive territorial analysis of the partner ports—LP1 North Adriatic Sea Port Authority, PP2 Port Network Authority of the Eastern Adriatic Sea, PP3 Port Network Authority of the Central Adriatic Sea, PP4 Central Adriatic Ports Authority, PP5 Southern Adriatic Sea Port Authority, PP6 Port of Rijeka Authority, PP7 Port of Zadar Authority, and PP8 Port of Ploče Authority—reveals both commonalities and unique challenges across the region. This strategy is anchored in the need for digital transformation, improved infrastructure, and strategic collaboration among stakeholders to foster a seamless and efficient maritime network.

Each partner port plays a distinct yet interconnected role in the Adriatic maritime corridor, highlighting the importance of a unified approach to last-mile accessibility. The North Adriatic Sea Port Authority, with its strategic position and advanced intermodal facilities, serves as a critical gateway for international trade, emphasizing the need for enhanced IT systems to manage growing

traffic volumes. Similarly, the Port Network Authority of the Eastern Adriatic Sea focuses on integrating its IT infrastructure to streamline operations and improve environmental sustainability, ensuring efficient cargo handling and reduced emissions.

The Central Adriatic Ports Authority and the Southern Adriatic Sea Port Authority underscore the importance of port community systems (PCS) and advanced traffic management solutions. These ports are leveraging ICT to enhance operational efficiency, reduce waiting times, and improve safety standards. Their strategies include the adoption of AI-driven systems, such as the Transfer in Security (TinS) in the Central Adriatic Ports Authority, which ensures secure and efficient vehicle movement within port areas.

The Port of Rijeka Authority stands out for its significant investments in modernizing port infrastructure and enhancing intermodal connectivity. By implementing advanced ICT solutions like the PCS and integrating with European transport networks, Rijeka aims to become a leading logistics hub in the northern Adriatic. Similarly, the Port of Zadar Authority focuses on upgrading its port management systems to improve data exchange, streamline operations, and support regional economic development.

The Port of Ploče Authority, a crucial transit hub for Bosnia and Herzegovina, exemplifies the strategic importance of ICT in facilitating seamless port operations. With its commitment to environmental sustainability and modernization of port infrastructure, Ploče aims to enhance its role in the European transport network, supporting both regional and international trade.

The overarching goal across all partner ports is to create a cohesive and interoperable ICT framework that supports efficient last-mile connectivity. This involves the integration of various IT systems, such as PCS, VBS, and ESB, to facilitate real-time data exchange, improve traffic management, and enhance security measures. By adopting these advanced technologies, the ports can optimize their operations, reduce carbon emissions, and provide better services to their users.

Furthermore, the strategy emphasizes the importance of stakeholder collaboration. Regular communication and feedback mechanisms among port authorities, terminal operators, customs agencies, and other stakeholders are crucial for the successful implementation of ICT solutions. This collaborative approach ensures that all parties are aligned with the strategic objectives and can contribute to the continuous improvement of port operations.

Financially, the strategy relies on leveraging European Union funds, public-private partnerships, and other funding mechanisms to support the development and implementation of ICT projects. This includes participation in initiatives like the Connecting Europe Facility (CEF), Cohesion Fund, and

various INTERREG programs, which provide the necessary financial resources to drive digital transformation in the ports.

The strategy for improving the last-mile accessibility of Adriatic ports through ICT is a multifaceted approach that addresses the unique needs of each port while fostering regional integration and collaboration. By investing in advanced technologies, enhancing infrastructure, and promoting stakeholder engagement, the Adriatic ports can achieve greater efficiency, sustainability, and competitiveness in the global maritime industry. This collective effort will not only benefit the ports themselves but also contribute to the broader economic growth and development of the region.