Pilot actions co-design and launch report – topic no. 2 - gates and entry/exit tools and procedures

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Introduction

Activity 2.2 is devoted to co-design, implement and evaluate the pilot actions and investments in topic no. 2: gates and entry/exit tools and procedures.

More specifically, Group members (*PP2, PP4, PP5 and PP7*) test in different sites complementary approaches on *gates and entry/exit tools and procedures*.

In ports, the gates automation and the digitalization of exit/entry procedures are crucial activities to ensure a smooth transition of important trucks and vehicles flows during the embarking and disembarking phases, on which depends the efficiency of last mile operations.

Technologies such as OCR cameras, artificial intelligent systems, QR codes or video detection system, as described in the pilot actions of partners 2, 4, 5 and 7, allow the setting up of remote-control systems able to process multiple data from different sources and make them available to all port operators, enhancing collaboration among stakeholders while at the same time increasing the security of port operations.

The pilot actions described in the next paragraphs aim at improving the smoothness and efficiency of the last mile operations in the involved ports by introducing innovative technologies to upgrade the gates control access and the monitoring of vehicles flows.

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

North Adriatic Sea Port Authority (PP2)

Title: Monitoring and traffic flow management in Venice

NASPA aims to implement a permanent monitoring network of road traffic in the port of Venice and Chioggia, with a twofold objective:

a) at port level: improvement of the port gates to extend the digitalisation already in place to all freight

b) entire last mile level - up to the motorways: connection to a wider monitoring system, i.e. to the digitalised information systems of other managing bodies (e.g. motorways, regional entities)

The pilot action and investment will consist of:

1) **Preliminary study and design for the development of the pilot action (planning phase)**, that aims to provide:

➢ analysis and planning of a permanent monitoring network of road traffic in the ports of Venice and Chioggia;

➢ the definition of ICT/ITS tools and their positioning.

The study is expected to provide a long-term plan, which can be implemented in subsequent steps, in order to have complete coverage of the last mile road traffic monitoring, integrated with the information available from other bodies. The plan will indicate infrastructures, technology, tools and installation points.

The AS IS scenario will be provided in order to integrate the existing system and tools along with a model TO BE that will be defined for the collection of road traffic information, that is to say 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.

2) **Implementation of an information system integrated with monitoring stations (installation phase)**

On the basis of the definition of number and typology of ICT/ITS tools defined in the planning phase, then the tools will be purchased and installed.

Central Adriatic Ports Authority (PP4)

TITLE: Optimization of AI flows control system in Ancona

The pilot action implemented by Central Adriatic Ports Authority is aimed at optimizing the Artificial Intelligent system that tracks and traces the trucks along the 850 mt path outside of the port circuit, from the ferry gates until the customs parking area, Scalo Marotti.

The AI system, set up with the contribution of PROMARES project (ITA-HR) and SMART-C project (CEF programme), works through a series of cameras installed at the port ferry gates (entry/exit) and at the Scalo Marotti area, that record the plates of the trucks and control their movements against a set of predefined rules.

The AI system is also interoperable with the AIDA system of the National Customs Agency that enabled the full digitalization of the customs clearing procedures for the extra-Schengen trucks.

The pilot action consists in the equipment of the existing poles located in the path between the gates and the Scalo Marotti, with electricity connection and other kind of cable connections (e.g. optical fiber) and adding more cameras along the same path, to ensure that any truck movement is captured by the AI system and the risk of illegal behaviours is reduced.

In particular, the new installations will strengthen the efficiency of customs control activity reinforcing the controls in a pivotal point of the port where the vehicles can either enter the Scalo Marotti to undergo customs clearing procedures or continue and exit the port The pilot action allows then to complete and upgrade of the current system where the cameras are active and available only at the gates and at Scalo Marotti.

Currently, technical design is being carried out to identify the precise number, location and type of cameras needed and the number of poles to be equipped as to make the cameras operative.

Southern Adriatic Sea Port Authority (PP5)

TITLE: Installing automated port gates

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.

This pilot action is necessary to lighten and speed up the traffic of goods vehicles passing through the port of Bari and the others port as they confirm themselves as nerve centres, intermodal and sustainable hubs.

The pilot action foresees the design and implementation of no.8/10 automated gates control solution in order to check vehicles at the port gates of the Southern Adriatic Sea Port System Authority (Ports of Bari, Brindisi, Manfredonia, Barletta, Monopoli and Termoli).

The IT solution must be equipped with software capable of dialoguing with the GAIA Port Community System in order to guarantee a fast response to the high flows of people and vehicles, with a loading balance mechanism of server farm itself, based on genetic controller, that ensures optimal operative velocities and performances.

Each automated gate control system must be composed at least by:

- an OCR Camera, in order to read vehicle plates.

- a QR code / RFID card reader, in order to get information about the GAIA access authorization.

- a voice communication system, in order to get support by the port security operators;

- an integrated gate barrier, in order to allow or not the gate access.

- the gate application system.

- the interoperability system (on CED premise / on Cloud), in order to get and send data to the PCS GAIA.

Port Authority of Zadar (PP7)

TITLE: Installing video analysis system in Zadar

The investment of the Zadar Port Authority (ZPA) consists in purchasing high resolution video detection cameras (hardware) and video detection analysis software for video/traffic flow processing, storage and cabling.

Pilot action shall provide opportunity for ZPA to obtain (additional) intelligence related to traffic and pedestrian flows (providing vehicle detection, categorization, counting, license plate recognition – LPR) related to ferry terminals as a necessary prerequisite for structural in-depth analysis and future ferry port processes optimizations on microscopic (port), mesoscopic (local) and macroscopic (state) levels.

List of requirements video detection system should meet:

1. Real time traffic congestion detection with availability to raise designated alarms;

2. Real time incident (including fire) detection with availability to raise designated alarms;

3. Continuous tracking of traffic volume (number of vehicles);

4. Calculation of average traffic flow speed;

5. Continuous monitoring of entry and exit traffic flow points;

6. Pedestrian detection;

7. Adjustment to various weather and light conditions;

8. Data integration with 3rd parties;

9. Real-time remote management.

Named video detection system features should translate to the following benefits in terms of port (including concessionaire) process optimizations:

1. Queue management in monitored area:

    a. Optimization (decreasing) ferry load/queue wait times

    b. Decreasing vehicle greenhouse gasses (GHG) emissions;

    c. Introduction of prioritized boarding for certain vehicle categories.

2. License Plate Recognition (LPR) providing fundamental data for:

a. Definition of Origin-Destination (O-D) matrices as an important factor in optimization of macroscopic traffic flows (state level – various state-owned public service providers – Croatian Motorways (Hrvatske Autoceste - HAC), Croatian Roads (Hrvatske ceste - HC)

b. Help ferry terminal(s) concessionaire to identify (and possibly prevent) certain (license plate related) misuses occurring at the ferry terminals.

3.   Vehicle categorization:

   a.   Providing number and category of inbound and outbound vehicles at ferry terminals (providing exact information about domestic and foreign users):

   b.   Identification of their time distribution;

4.   Ferry timetable optimizations (ferry line concessionaire);

5.   Incident detection (prompt alarming of emergency services i.e. Police, Firefighters, EMS, etc.);

6.   Approximation of number of pedestrians circulating within monitored area (can be used for providing various 3rd party services);

7.   Provision of custom-tailored services based on terminal(s) traffic flow data;

8.   Possible integration with any local/state public/private entity interested in providing any kind of related value-added services.

Pilot action Time plan

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

PP2 – North Adriatic Sea Port Authority	
Milestone	**Date (MM/YYYY)**
Launch of the tender	22 November 2024
Award of the tender	Within 17 January 2025
Start of the activity	January 2025
End of the activity	End 2025

PP4 – Central Adriatic Ports Authority	
Milestone	**Date (MM/YYYY)**
Launch of the tender	March 2025
Award of the tender	June 2025
Start of the activity	September 2025
End of the activity	December 2025

PP5 – Southern Adriatic Sea Port Authority	
Milestone	**Date (MM/YYYY)**
Launch of the tender	February 2025
Award of the tender	March 2025
Start of the activity	May 2025
End of the activity	August 2025

PP7 – Port Authority of Zadar	
Milestone	**Date (MM/YYYY)**
Launch of the tender	01/2025
Award of the tender	02-04/2025
Start of the activity	05/2025
End of the activity	06-07/2025

Conclusions

The pilot actions and investments to be implemented by partners n. 2, 4, 5 and 7 in MILEPORT project share the intention of increasing the knowledge and information on the road traffic (either trucks or vehicles) and improving the controls at the ports' gates through the application of advanced ICT technologies.

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

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

Each partner suggested a list **KPIs** inherent to their specific pilot action that will allow to measure the upgrading of the respective gates and entry/exit tools and procedures in percentage terms when the activity will be completed. It can be observed that the lists of KPIs per partner present similarities and grounds for comparison against common references.

PP2 – NORTH ADRIATIC SEA PORT AUTHORITY

- Reduction of waiting time at the gates

- Level of existing IT system upgrading

- Number of new processes digitalized

- Level of increased monitoring/control of road traffic

PP4 – CENTRAL ADRIATIC PORTS AUTHORITY

- Reduction of km travelled by trucks in the port areas

- Reduction of waiting time at the gates

- Upgrading of existing IT system

- Number of new processes digitalized

PP5 – SOUTHERN ADRIATIC SEA PORT AUTHORITY

- Reduction of waiting time at the gates

- Reduction of Co2 emissions

- Upgrading of existing IT system

PP7 – PORT AUTHORITY OF ZADAR

- Terminal gates used for data collection

- Implementation of new traffic monitoring IT system as a baseline for achieving IT systems interoperability