# TinS: THE FIRST APPLICATION OF A.I. IN THE PORT OF ANCONA

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SMART · C
customs & logistics facilities

Central Adriatic Ports Authority

Ports of Pesaro, Falconara Marittima, Ancona, S. Benedetto, Pescara, Ortona

Co-financed by the Connecting Europe
Facility of the European Union

# THE CENTRAL ADRIATIC PORTS AUTHORITY

Porto di Pesaro
Porto di Falconara
Porto di Ancona

*Mar Adriatico*

Porto di San Benedetto del Tronto

Porto di Pescara
Porto di Ortona

**6 ports**

**11,8 millions tons of good**

**1,2 million passengers**

**9.016 workers**

**2 regions**

**3 main cities**

**2 Maritime Directions**

**2 Interregional Custom Directions**

**215 km, the length of the coastline**

Connecting EU insights
Circle Group

# ANCONA: GATEWAY TO THE EAST

Ancona, core port of the Scan-Med Corridor

Bridgehead of several routes connecting more than 85 NUTS1 EU regions, with Balkan countries, South-East Med and Black Sea area

Main gateway for trade relations with third countries in the Med area, therefore efficient customs services are an added value for trade facilitation

Growing traffic on the Ancona-Durres line: +185% in the period 2015-2019.



Principali flussi di origine e destinazione del traffico merci RO/PAX del porto di Ancona
Origin and destination of the main freight flows of the RO/PAX traffic in the port of Ancona
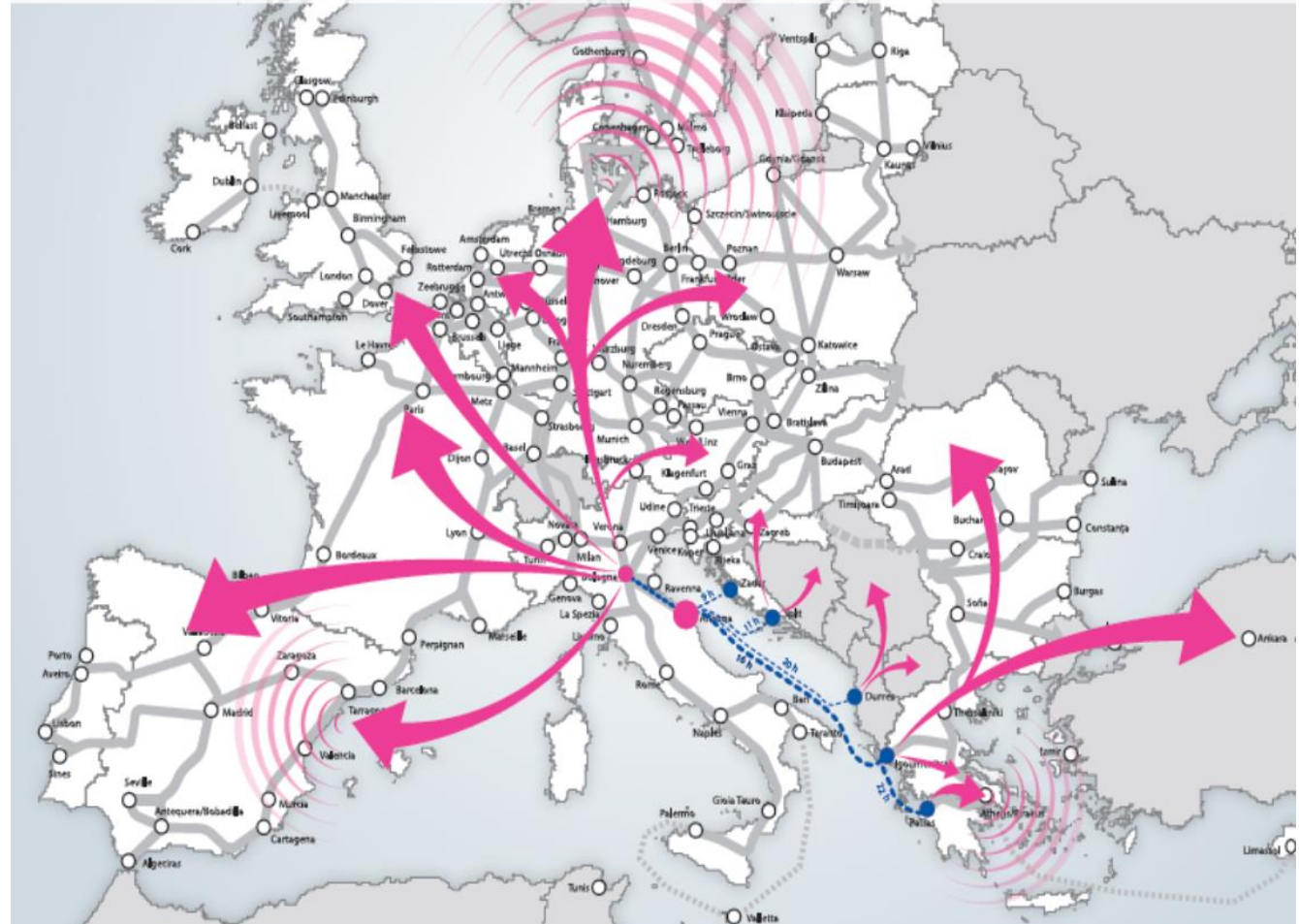
# ANCONA: A CITY PORT FOR INTERNATIONAL MoS

- Ferry terminals are close to the town centre;

- Lack of parking surfaces inside the Customs area;

- Inefficient port organisation as alternative to the lack of spaces

Innovation action to:

- Bypass the port infrastructural weaknesses and improve the quality of service;

- Ensure a proper environment for controls to allow the use of port external areas.
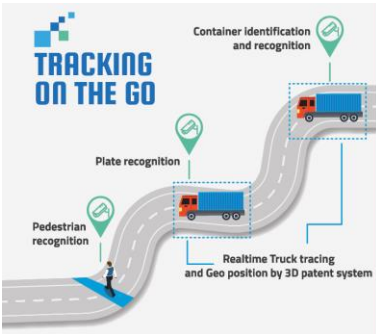
The virtual tunnel links Scalo Marotti with the ferry terminal Customs Gate, using **AI technology as an innovative solution for the secure transfer of the cargo.**
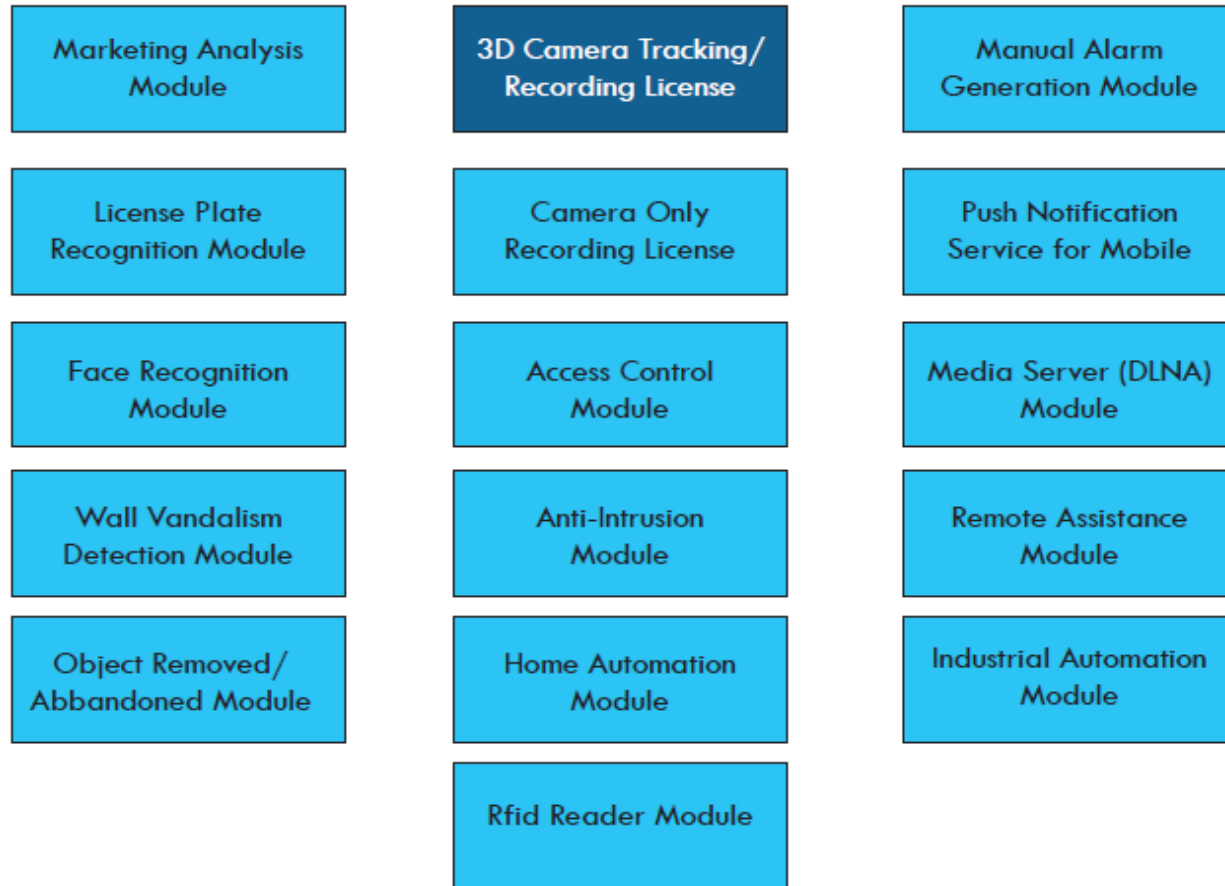
The TinS global project aims at establishing an innovative procedure for customs controls OUTSIDE the port area for vehicles related to ferry traffic. The procedure aims at being opened for all kinds of customs formalities to be performed in port without prior registration of the forwarder, to ensure the flexibility requested by operators and shipping lines.

To that extent the Central Adriatic Ports Authority selected an AI system (A3IU) to:
1) control the "virtual tunnel" between the ferry terminals and the Scalo Marotti customs parking;
2) Ensure the e-dialogue with the Customs Agency AIDA system and its innovative applications, to give real time information about the ferry (containers) cargo flows in port areas.

# ARTIFICIAL INTELLIGENCE TO TRACK AND TRACE VEHICLES FLOWS

| | | |
|---|---|---|
| Marketing Analysis Module | 3D Camera Tracking/ Recording License | Manual Alarm Generation Module |
| License Plate Recognition Module | Camera Only Recording License | Push Notification Service for Mobile |
| Face Recognition Module | Access Control Module | Media Server (DLNA) Module |
| Wall Vandalism Detection Module | Anti-Intrusion Module | Remote Assistance Module |
| Object Removed/ Abbandoned Module | Home Automation Module | Industrial Automation Module |
| | Rfid Reader Module | |

**A.I. multitasking advantages. Opportunities in port operations:**

- Surveillance and monitoring
- Traffic flows management
- Safety applications
- Security applications
- Data management
- Disaster prevention

Legend:
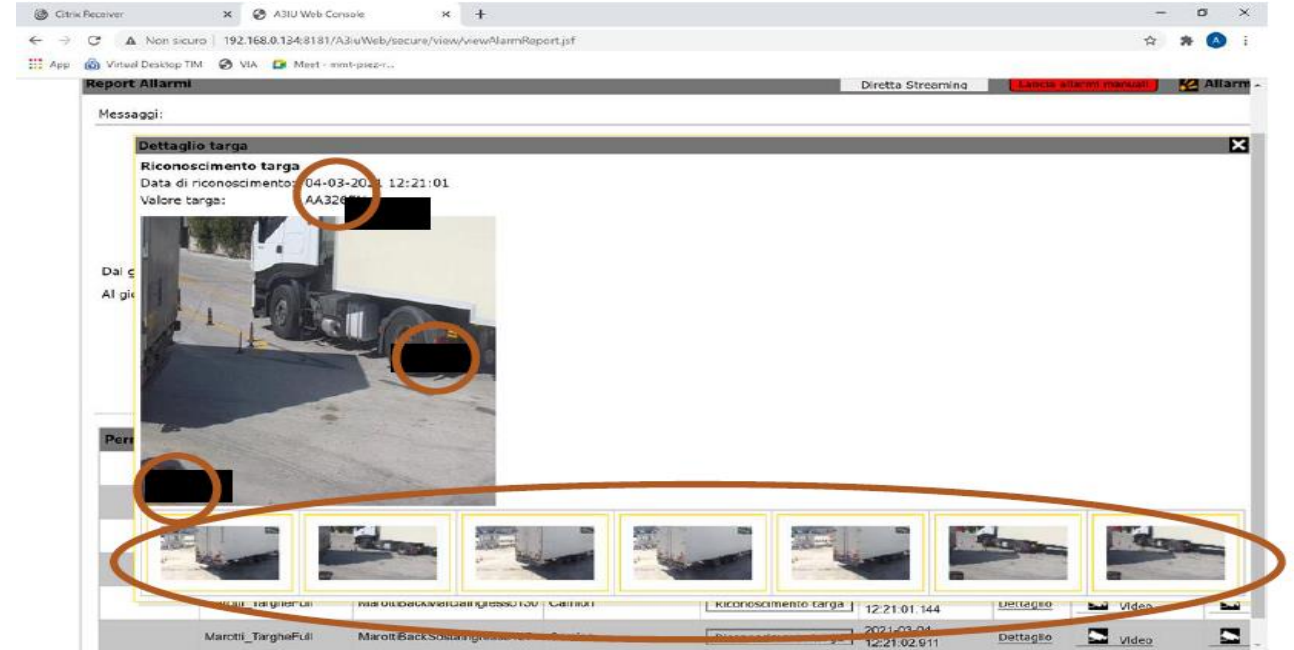
A3IU Core Software Module
A3IU Optional Software Module

A3iu
ADVANCED
AUTONOMUS
ARTIFICIAL
INTELLIGENT
UNIT

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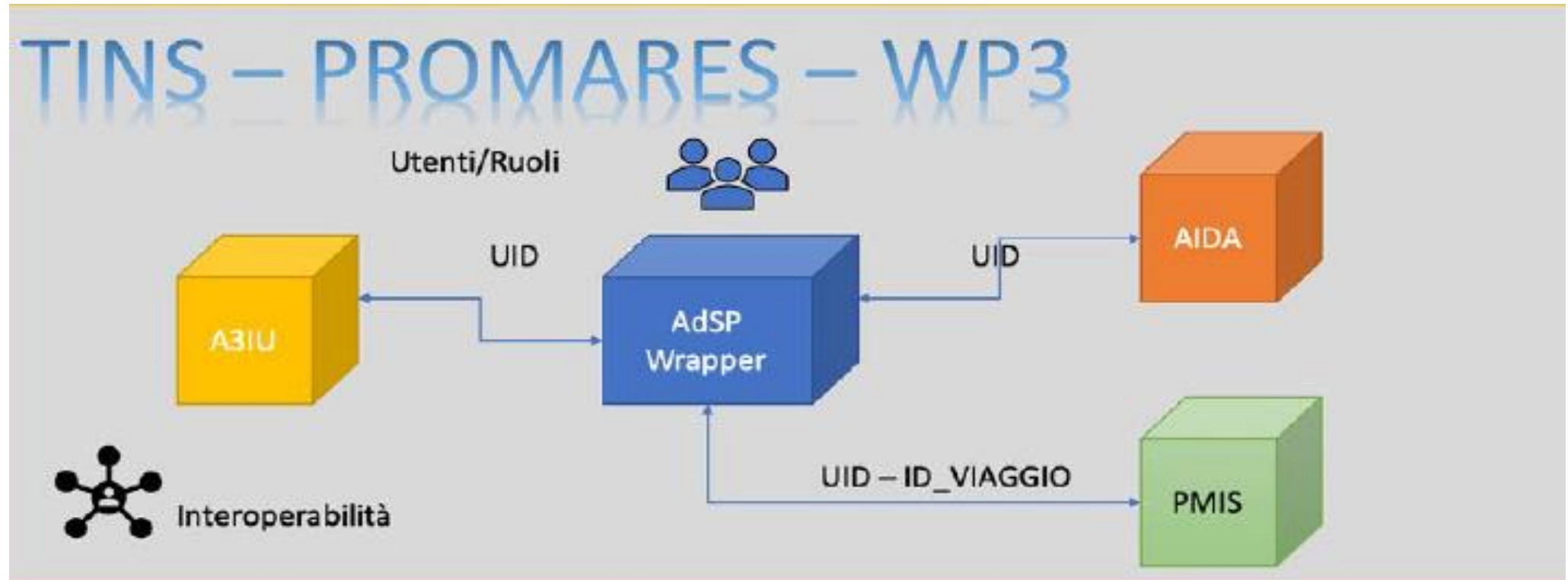
**A.I. needs to be supported by a specific software for the interaction of the different stakeholders:**

- Maritime agents;
- Customs forwarders
- Customs and GdF
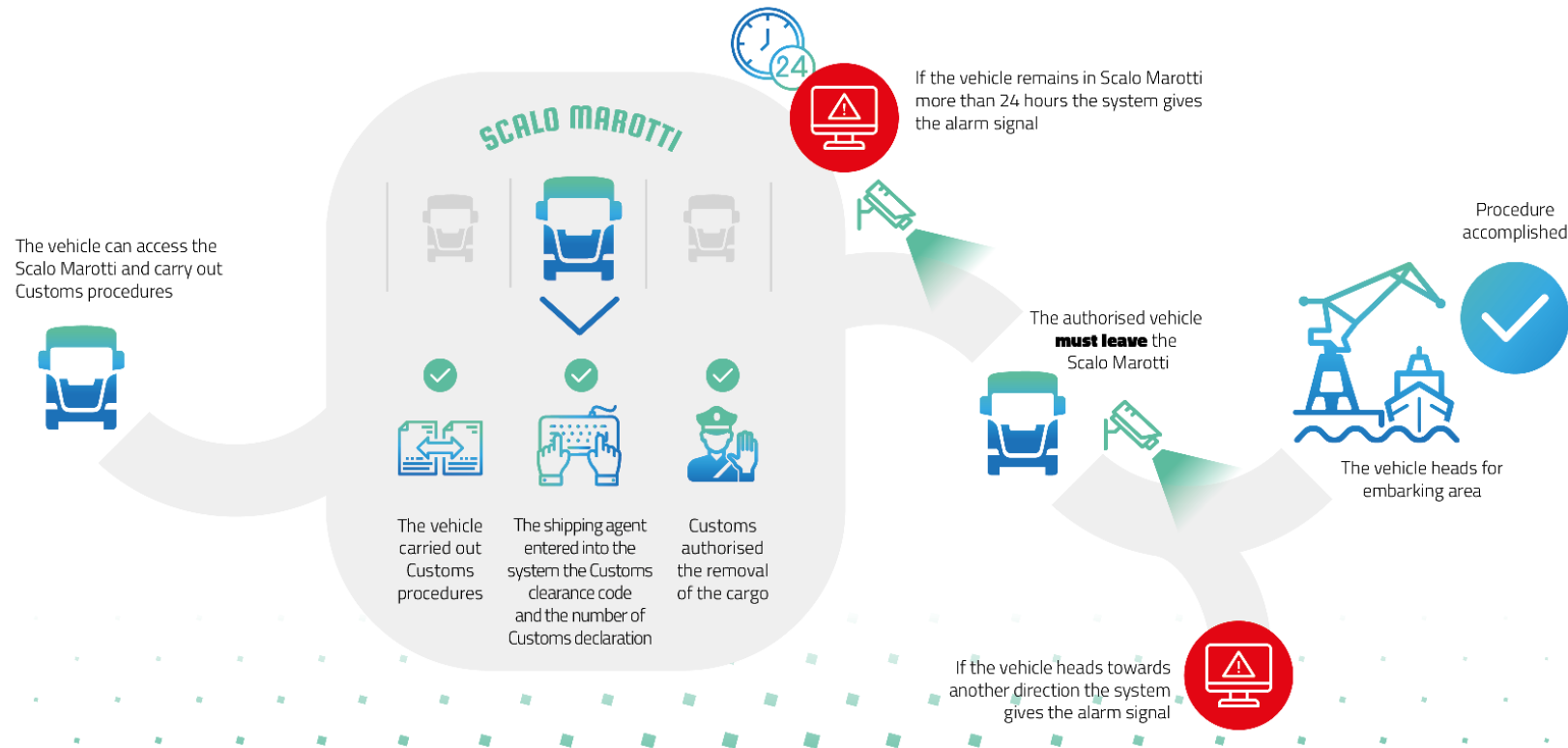- Harbour master
- Port authority

**Gates represent the main node of the project. Physical objects and data are matched at gate and the information are distributed to the different actors**

# ARTIFICIAL INTELLIGENCE TO TRACK AND TRACE VEHICLES FLOWS
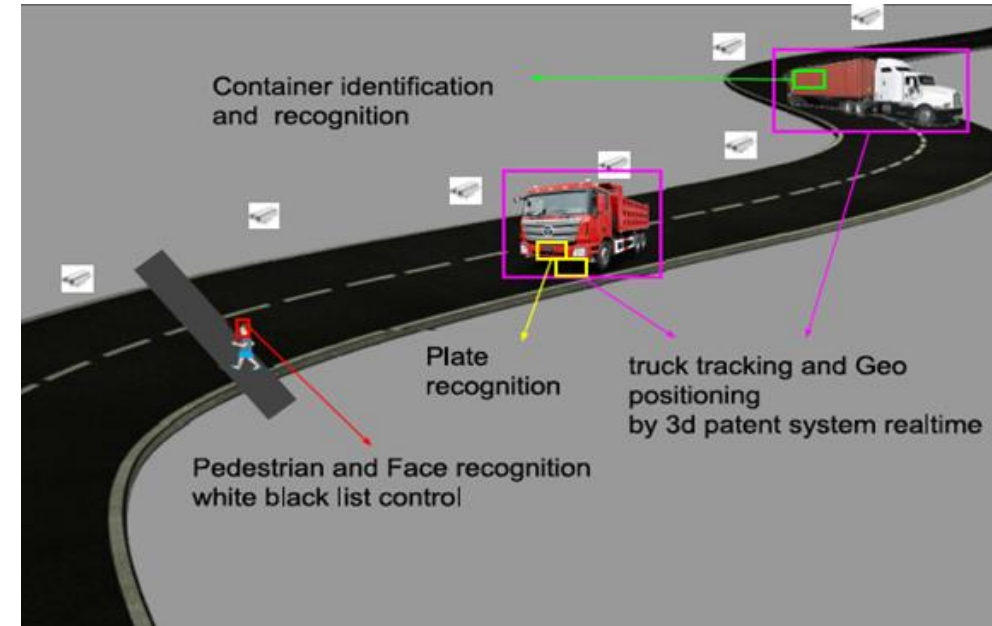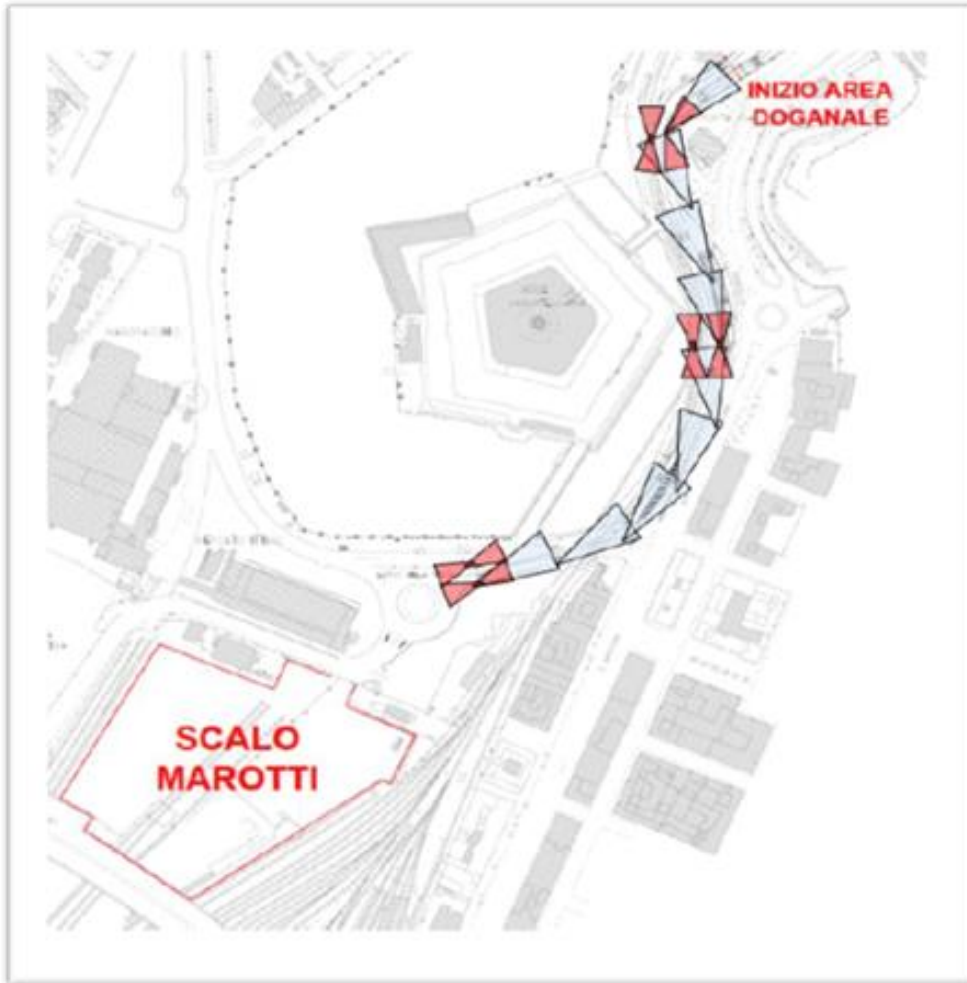




- The virtual tunnel is made of IP cameras that send information to the AI system.
- The AI system recognizes, tracks and traces the different vehicles. It sends real time information to AIDA software;
- The cargo information are provided by an additional application developed to collect freight customs information and vehicles data

# How the system works: use case EMBARKING FLOW



SCALO MAROTTI

The vehicle can access the Scalo Marotti and carry out Customs procedures

The vehicle carried out Customs procedures

The shipping agent entered into the system the Customs clearance code and the number of Customs declaration

Customs authorised the removal of the cargo

If the vehicle remains in Scalo Marotti more than 24 hours the system gives the alarm signal

The authorised vehicle **must leave** the Scalo Marotti

If the vehicle heads towards another direction the system gives the alarm signal

Procedure accomplished

The vehicle heads for embarking area

- The truck enters in the port and is directed to Scalo Marotti customs parking;

- The truck can exit the Scalo Marotti customs partking only when it has been authorized by the Customs Agency – performed the customs procedures

- **INTEROPERABILITY BETWEEN THE AI SYSTEM and AIDA , the ICT system of National Customs and Monopolies Agency**

- If the truck stays too long in the Scalo Marotti, or try to exit whithout the authorization of the Customs Agency, or if it heads towards a direction different from the embarking areas, the AI system gives the alarm signal

## Current status of the project

- **4 gates fully equipped**

- **Interoperability fully tested with ADM (Customs)**

- **Virtual tunnel in the contracting phase;**

- **Wrapper software in the final development phase;**

# INNOVATION & BENEFITS

### IMPROVEMENT OF EFFICIENCY OF PORT OPERATIONS

The automatic tracking of trucks movements in the port areas and the digitalization of customs formalities contribute to increase efficiency of port operations, with benefits in terms of time saving and real time controls for all the logistics chain actors involved (Customs, Guardia di Finanza, forwarders, drivers, maritime agencies, …)

### REDUCTION OF ENVIRONMENTAL IMPACT OF TRUCKS TRAFFIC

The optimisation of the trucks road path in the port areas allows to save around 60,000 Km/y of heavy vehicles traffic, with a significative reduction of polluting emissions for the benefits of the whole Ancona urban area.

### CEF programme contribution

EU acknowledged the innovative caracther of the application of Artificial Intelligence to the port logistics and cofinanced at 50% the costs related to the technological investments.

(*Smart-C Project*, Action n.2018-IT-TM-0106-S,CEF programme, Innovation & new technologies 2018 call)