Cooperative Logistics for Sustainable Mobility of Goods

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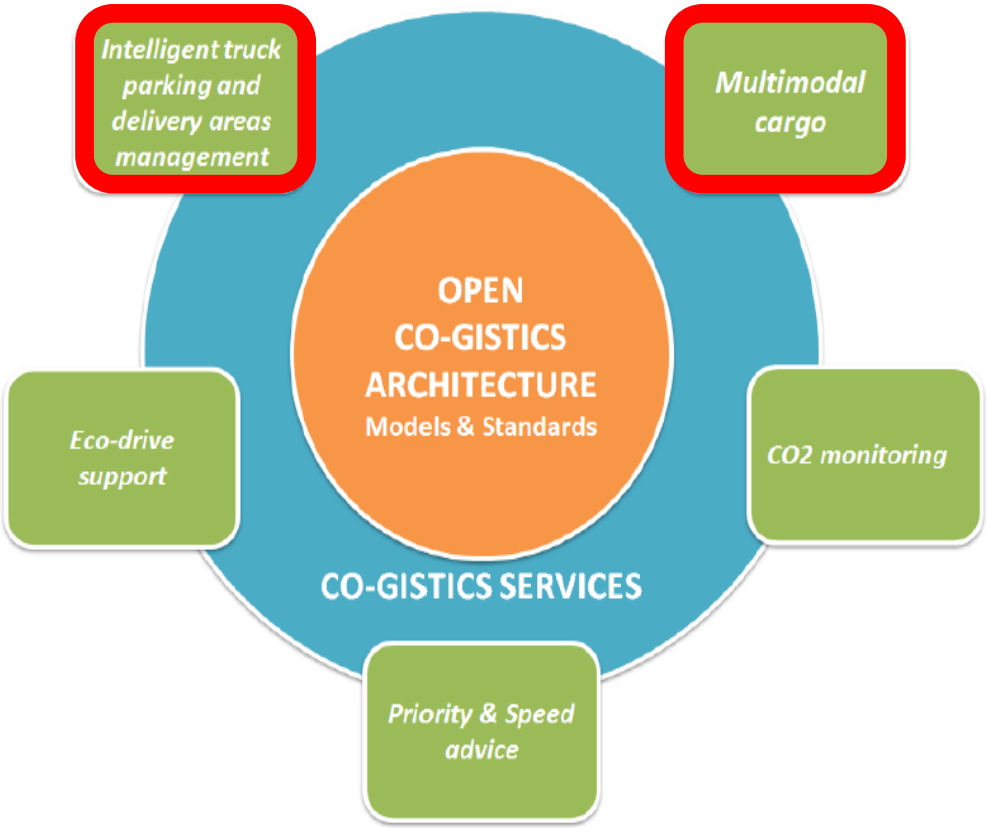
- CO-GISTICS is the first European project fully dedicated to the deployment of cooperative intelligent transport systems applied to logistics.

- CO-GISTICS consortium is of 33 partners including public authorities, fleet operators, trucks, freight forwarders, terminal operators and logistics providers.

- Five services and activities are directed to create cooperation with third parties, stakeholders, as well as with other European and international initiatives.

Services



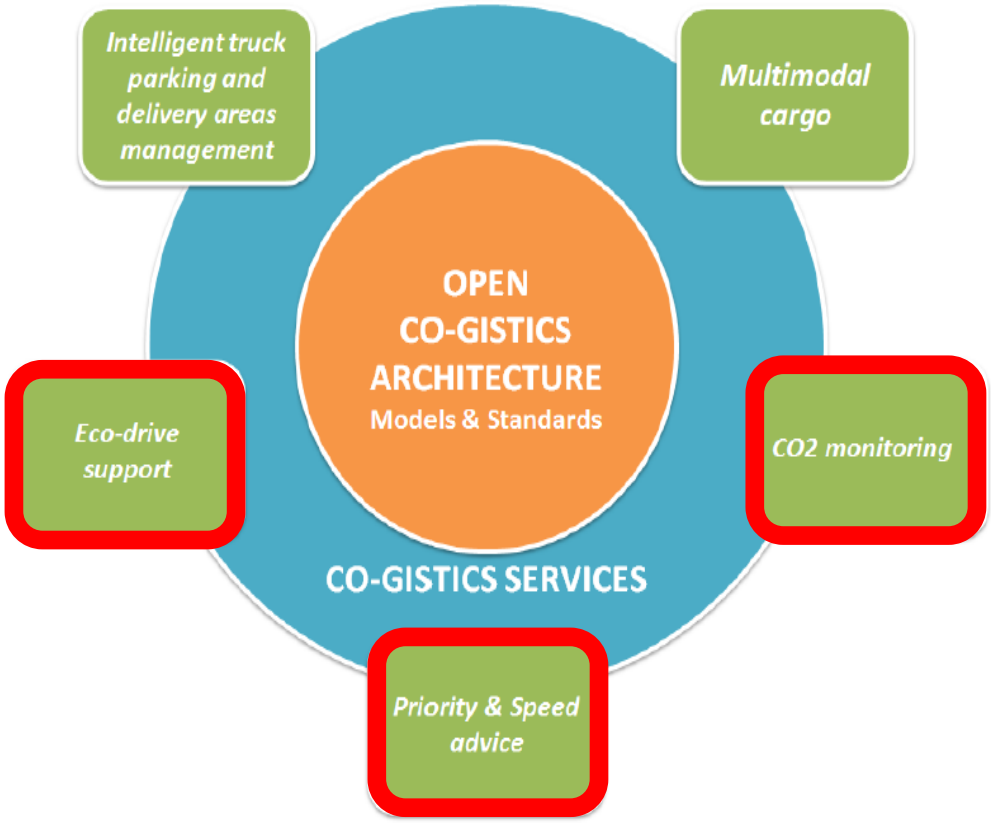
- **intelligent truck parking and delivery areas management,**

  optimizing the vehicle stops along their route, the delivery of goods in urban areas and the interface with other modes of transport.

- **multimodal cargo,**

  supporting planning and synchronization between different transport modes during the various logistic operations.

Services



- **CO2 footprint estimation and monitoring**

  measuring the CO2 output of the vehicles and providing an estimation of CO2 emissions of specific cargo operation;
- **priority and speed advice**,

  saving fuel consumption, reducing emissions;
- **eco-drive support,**

  supporting truck drivers in adopting a more energy efficient driving style and therefore reducing fuel consumption and CO2 emissions.

Pilot Sites

France – Bordeaux (Harbour) is an important logistics hub.

Germany – Frankfurt (Airport) is a major intermodal hub in Europe.

Greece – Thessaloniki (Harbor).

Italy – Trieste (Harbour and Rail) is an intermodal hub between road, sea and rail connections.

Romania – Arad represents one of the Eastern European fleets driving across the continent.

Spain – Bilbao has strong background in urban logistics and mobility pilots.

Spain – Vigo is one of the leading centers for development and deployment of cooperative services in Europe.

The Trieste Pilot Site

The Polytechnic of Bari is a partner of CO-GISTICS and collaborates for the deployment of the Trieste pilot site and in particular the specification of a Decision Support System (DSS).

The Trieste Pilot Site

Friuli-Venezia Giulia is a northeastern Italian region of about 1,2 million inhabitants.

Trieste is a cosmopolitan city of more than 200.000 inhabitants, the capital of the autonomous region Friuli-Venezia Giulia.

It is on the crossing of the **TEN-T Core Corridors Baltic-Adriatic** and **Mediterranean,** and on the **Adriatic-Ionian Motorway of the Sea.**

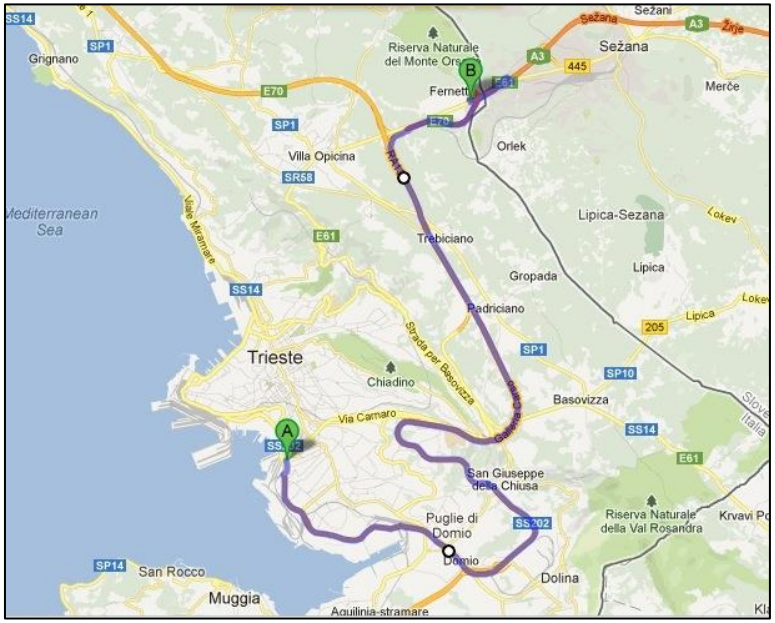
The Trieste Pilot Site

The Port of Trieste

- Free port for goods since 1719
- Busy container and oil terminals
- Sea highway connecting the ports of Trieste and Istanbul (one of the busiest RO/RO routes in the Mediterranean)

Regional freight transport

- Motorway and railway networks linked to the three regional ports
- Intermodality guaranteed by Cervignano terminal, Interporto di Trieste inland terminal and Gorizia inland terminal



Interporto di Trieste inland terminal

- Manages the trucks flow (about 300.000 trucks/year) to Turkey through the RO-RO ship system from the port of Trieste

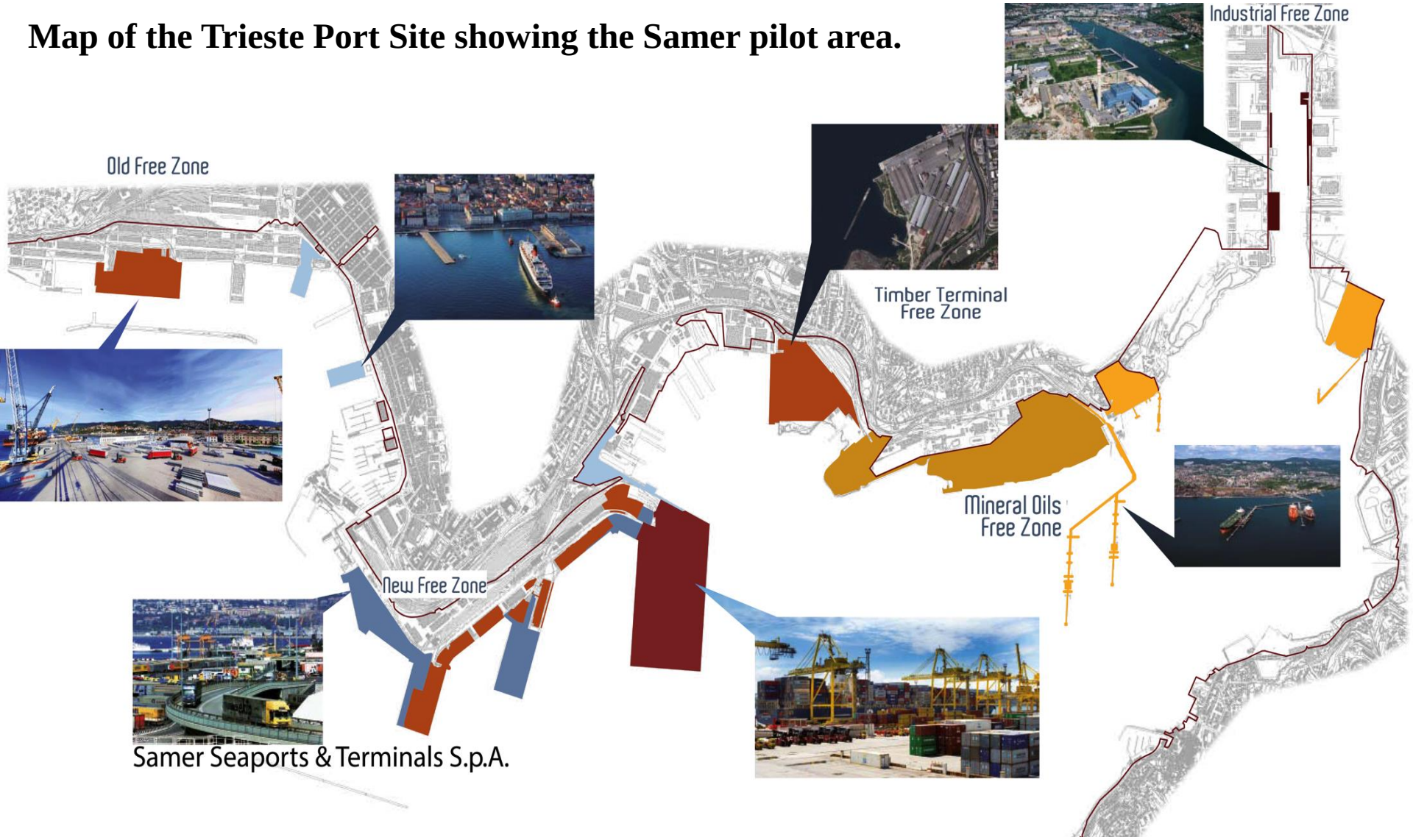
The Trieste Pilot Site

The objectives and related expected impacts of the Trieste task force are:

- **to identify best deployment of the 5 CO-GISTICS ITS services and applications** which will be used as a basis for industry consultation and to identify necessary enabling technology/technologies.

- **to guide, coordinate and monitor the progress of the development and implementation and standardisation of ITS solutions for freight transport and logistics** in the Trieste Pilot site as well as in the European transportation system to ensure a timely, effective and harmonised deployment of those services.

Map of the Trieste Port Site showing the Samer pilot area.



Full and Associated Partners

ICOOR

de remi facemmo ali 1990 POLITECNICO DI BARI

AUTORITA PORTUALE TRIESTE

AutLogS s.r.l.

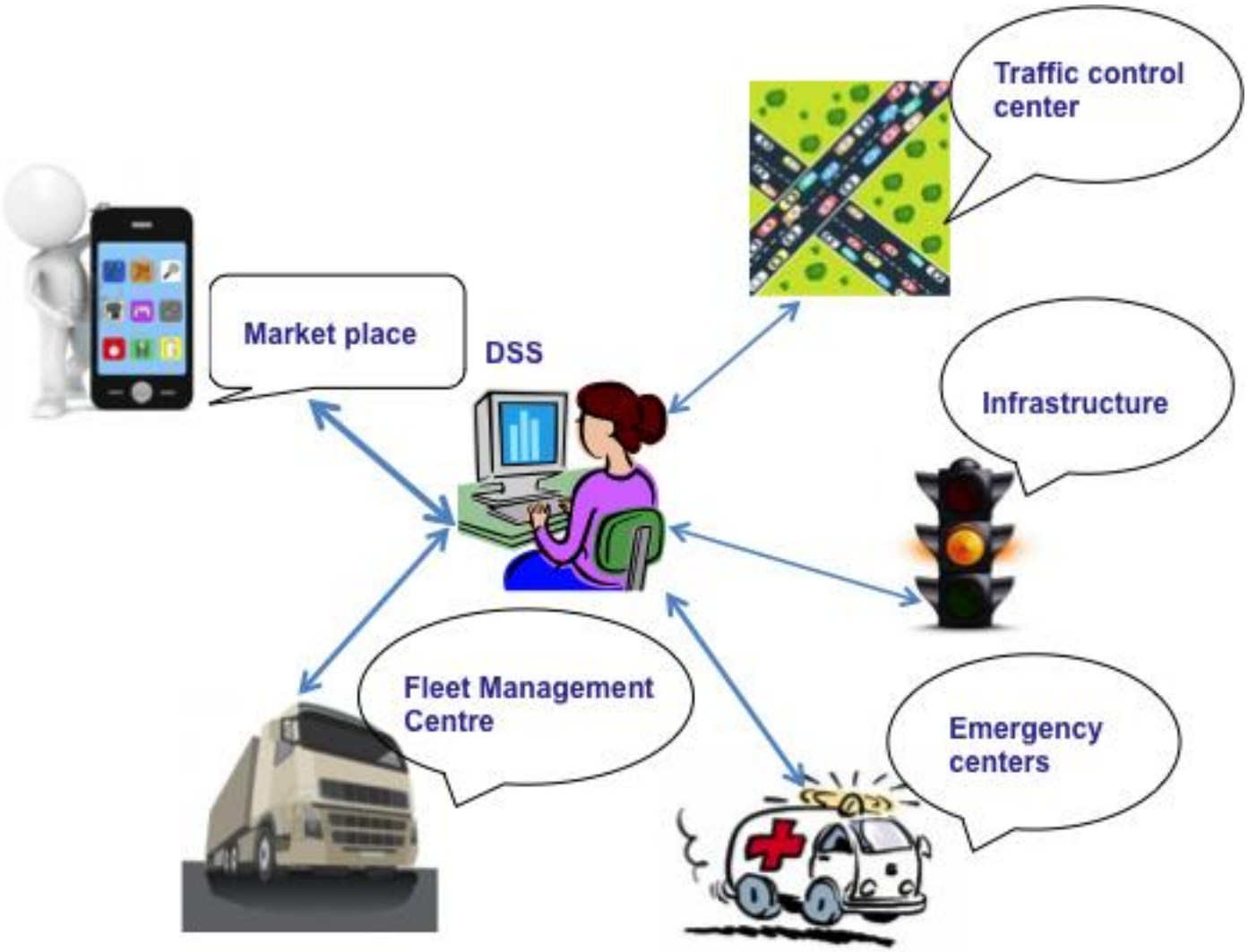
Samer&Co. shipping

FERNETTI

autamarocchi

PLUSERVICE.NET

Decision Support System

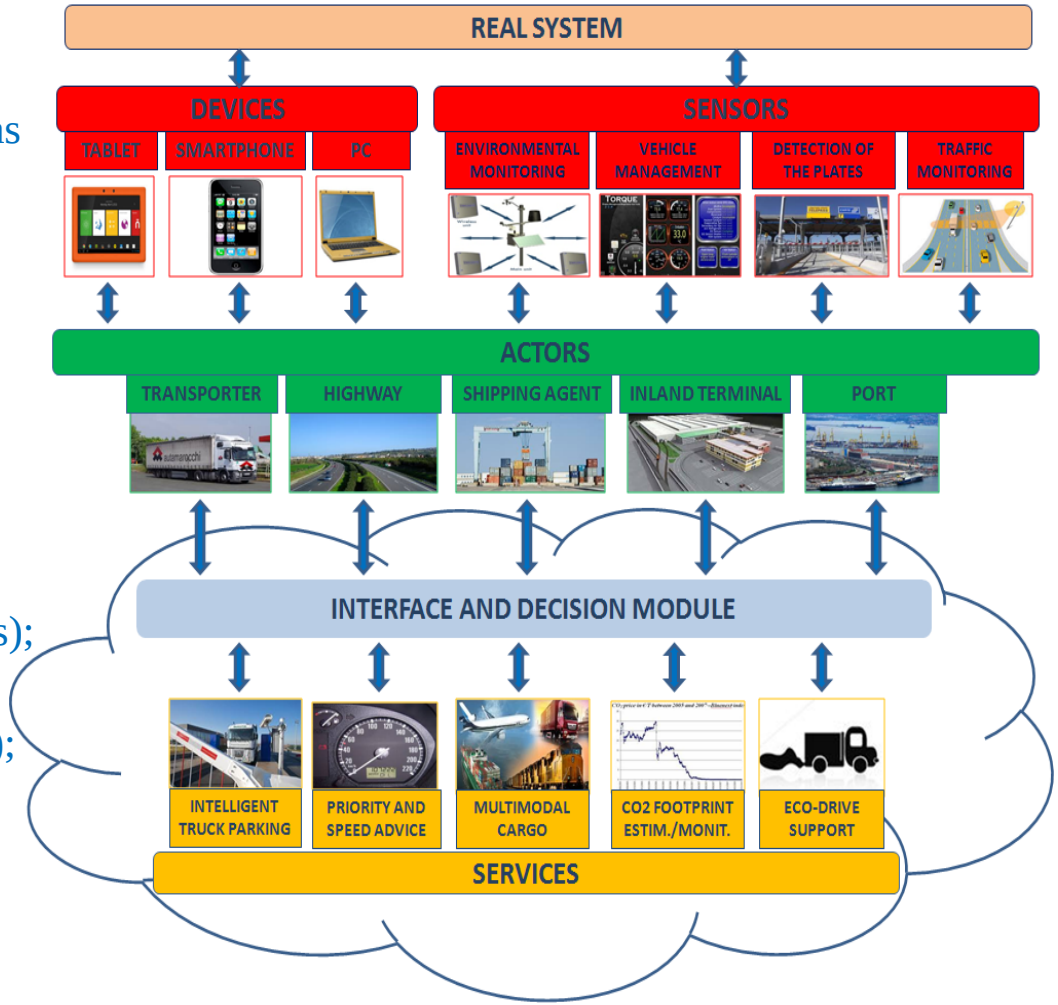


The **Polytechnic of Bari** is responsible of the development of a **Decision Support System:**

- **Support decisions** of the involved actors
- **Optimize** the system performances
- **Improve** the customer satisfaction.

Identify the enablers for the implementation of the 5 CO-GISTICS services divided into the following five areas in conjunction and coordination with all the partners and relevant stakeholders:

1. **Interoperability**
   (Standardisation and Testing);
2. **Policy**
   (Privacy and Liability);
3. **Information**
   (Data access and Service access);
4. **Financing**
   (Procurement and Cost-benefit);
5. **Final User usage**
   (Acceptance and Awareness).

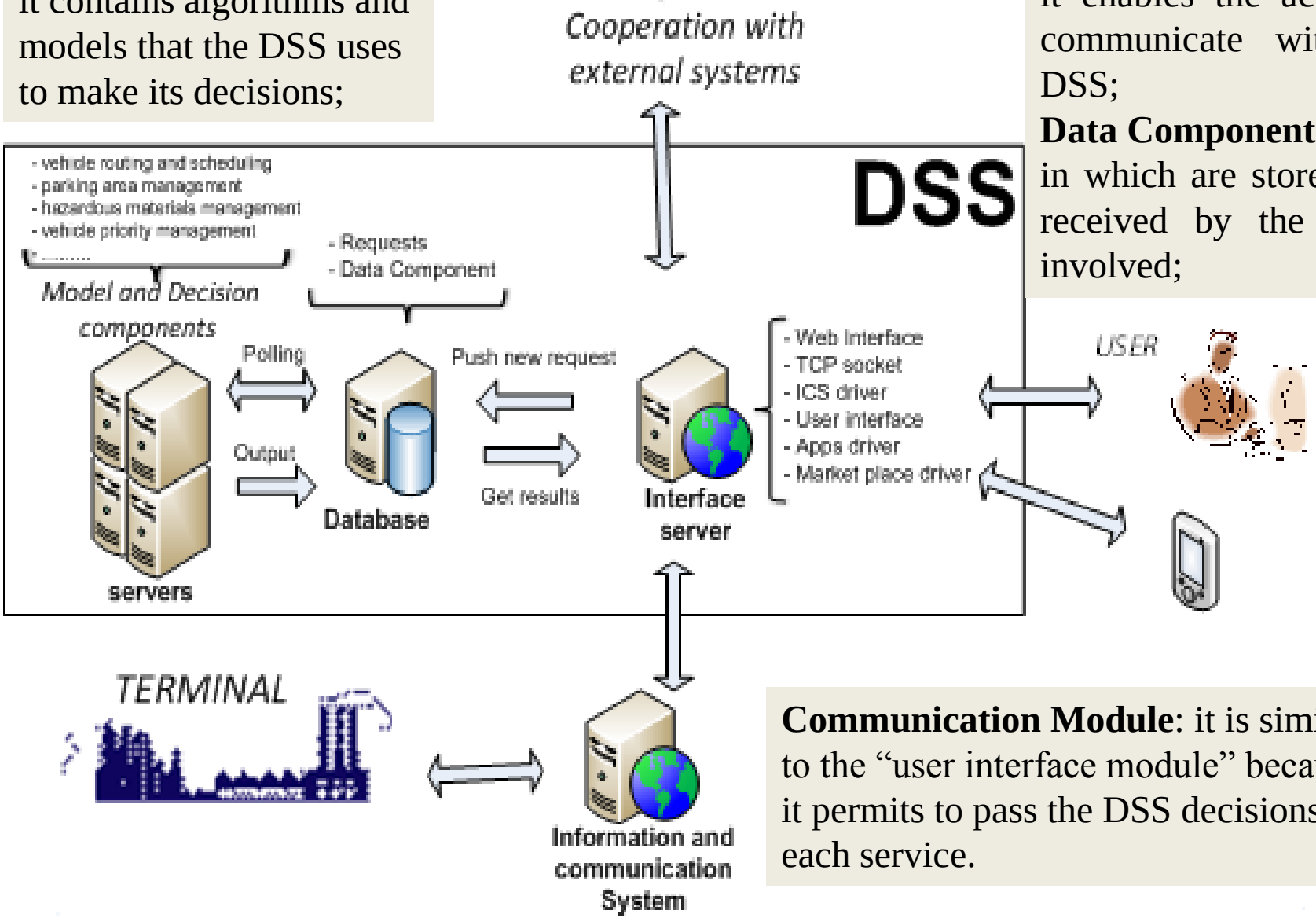


EQUIPMENT

Decision Module:
it contains algorithms and models that the DSS uses to make its decisions;

User Interface:
it enables the actors to communicate with the DSS;

Data Component:
in which are stored data received by the actors involved;



Communication Module: it is similar to the "user interface module" because it permits to pass the DSS decisions to each service.

1. **ROUTING**: when truck arrives at Lisert - Sistiana tollbooth, Autovie Venete System detects its plate number. So the DSS suggests to truck the best route: Port or Inland terminal.

2. **GATE ASSIGNMENT**: on the basis of traffic condition, the DSS assigns the gate at the port of Trieste.

3. **CALLING POLICIES**: establishing which is the right moment to call trucks that are waiting at inland terminal to reach port for boarding. It's important to avoid:
   - delay in ship departure;
   - queues at port entrance;
   - overfilling of port/inland terminal parking.

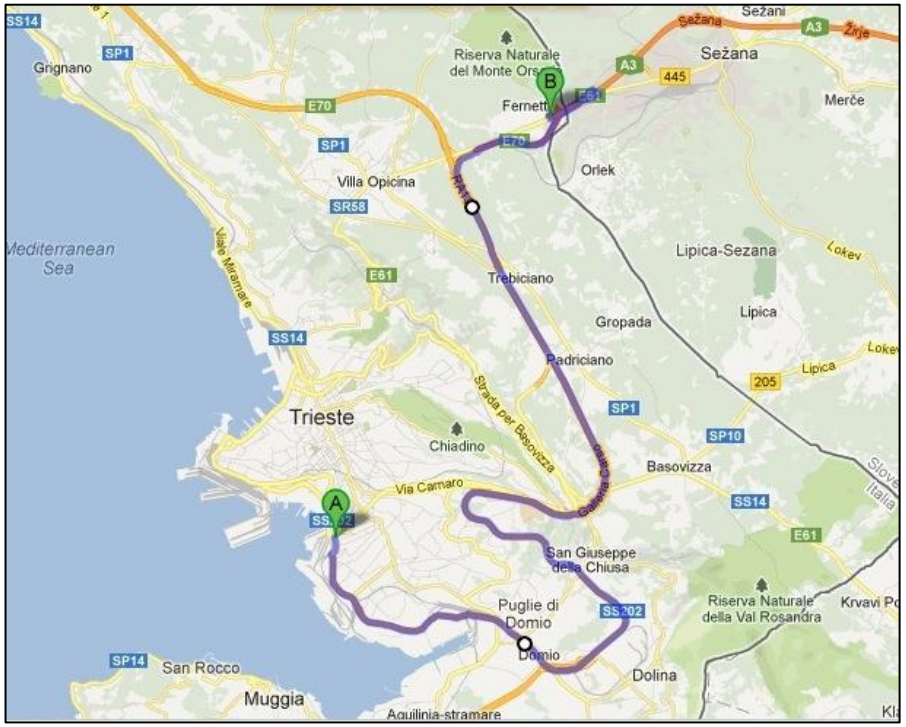
- **THROUGHPUT** of trucks/ships (ships-trucks/year)
- **LEAD TIME** of trucks/ships (hours)
- **NUMBERS OF TRUCKS LOADED ON SHIP** (number of trucks)
- **LATENESS OF SHIP DEPARTURES** (hours)
- **UTILIZATION** of: port, inland terminal, gates (%)
- **QUEUE LENGTH** at: port, inland terminal, gates (number of trucks)
- **WAITING TIME IN QUEUE** at: port, inland terminal, gates (hours)

… CO-GISTICS is followed by another H2020 project:

Architecture for EurOpean Logistics Information eXchange

Trieste Objectives

OPTIMISATION OF THE CUSTOMS PROCEDURES



- **PRE-CLEARING** operations
- **MONITORING** of the movements of the trucks that have already performed the customs procedures at the Interporto di Trieste inland terminal

Challenges: AS IS Situation

TRUCK LEADING TO THE PORT OF TRIESTE

SHOULD PASS THROUGHOUT THE **INTERPORTO DI TRIESTE INLAND TERMINAL FOR BOOKING OPERATIONS**

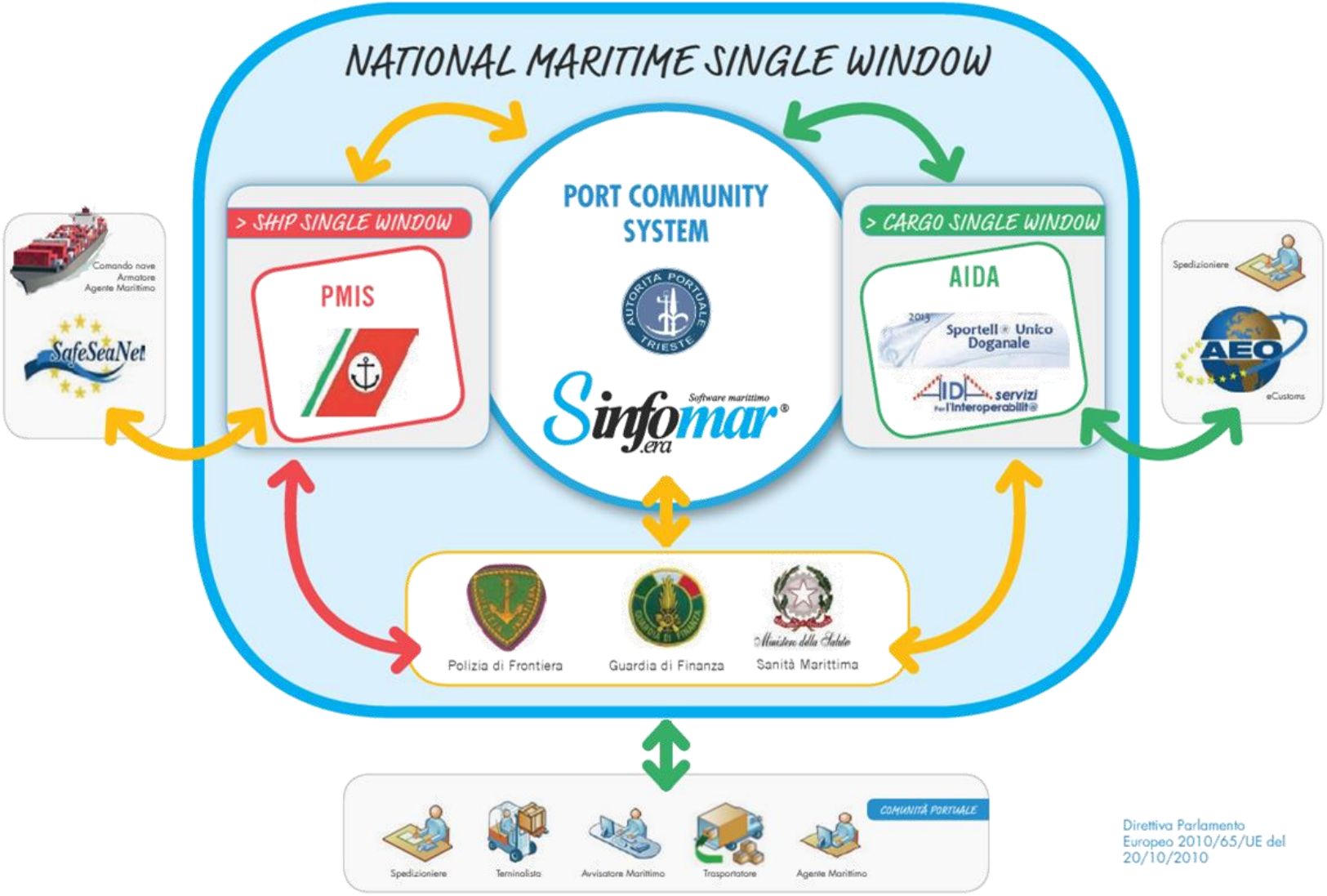
TRUCK ROUTE LENGHTENED OF ABOUT 10 KM

Challenges: AS IS Situation

Issues

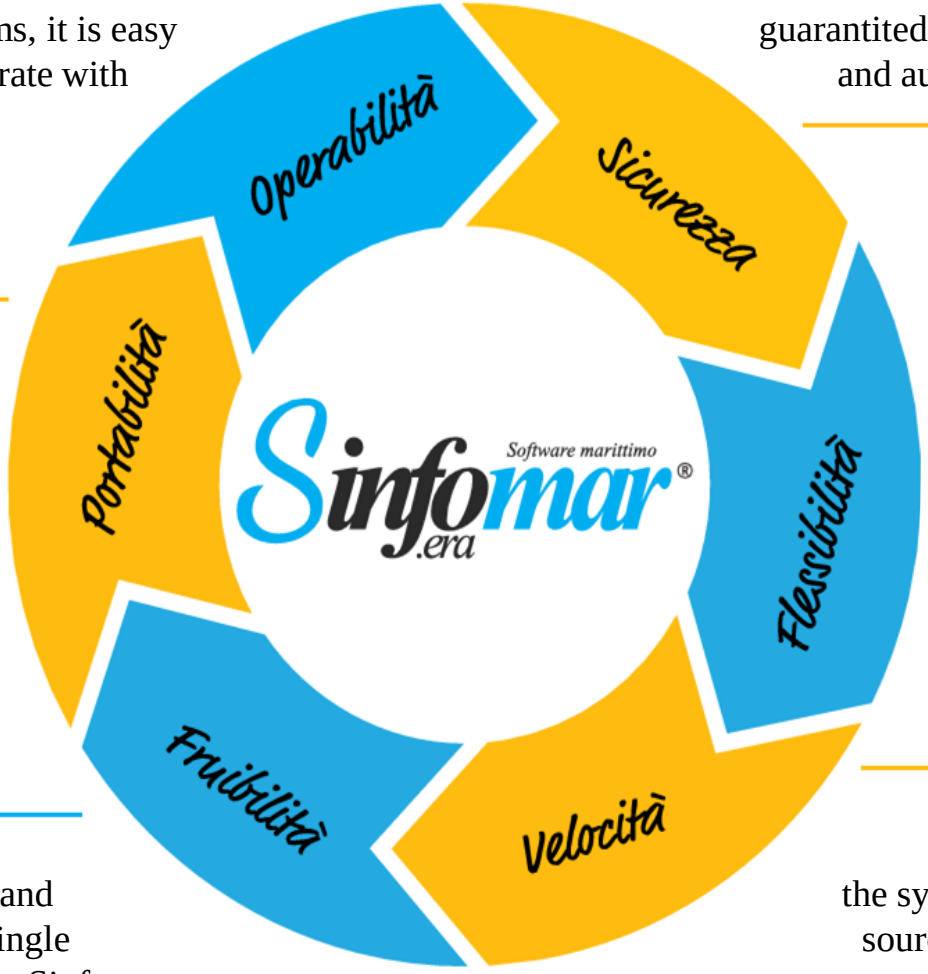
COSTS	**SECURITY**	**USAGE**	**SECURITY**	**QUEUES**	**DELAY**
TIME	**TIME**		**TIME**	**USAGE**	**SYNCHRONIZATION**
				SECURITY	

Sketch of the Port Community System (PCS)



Operability:
thanks to its standard communication systems, it is easy to integrate or collaborate with external systems.

Security:
Data exchage sercurity guarantited by an authorization and autentication process.



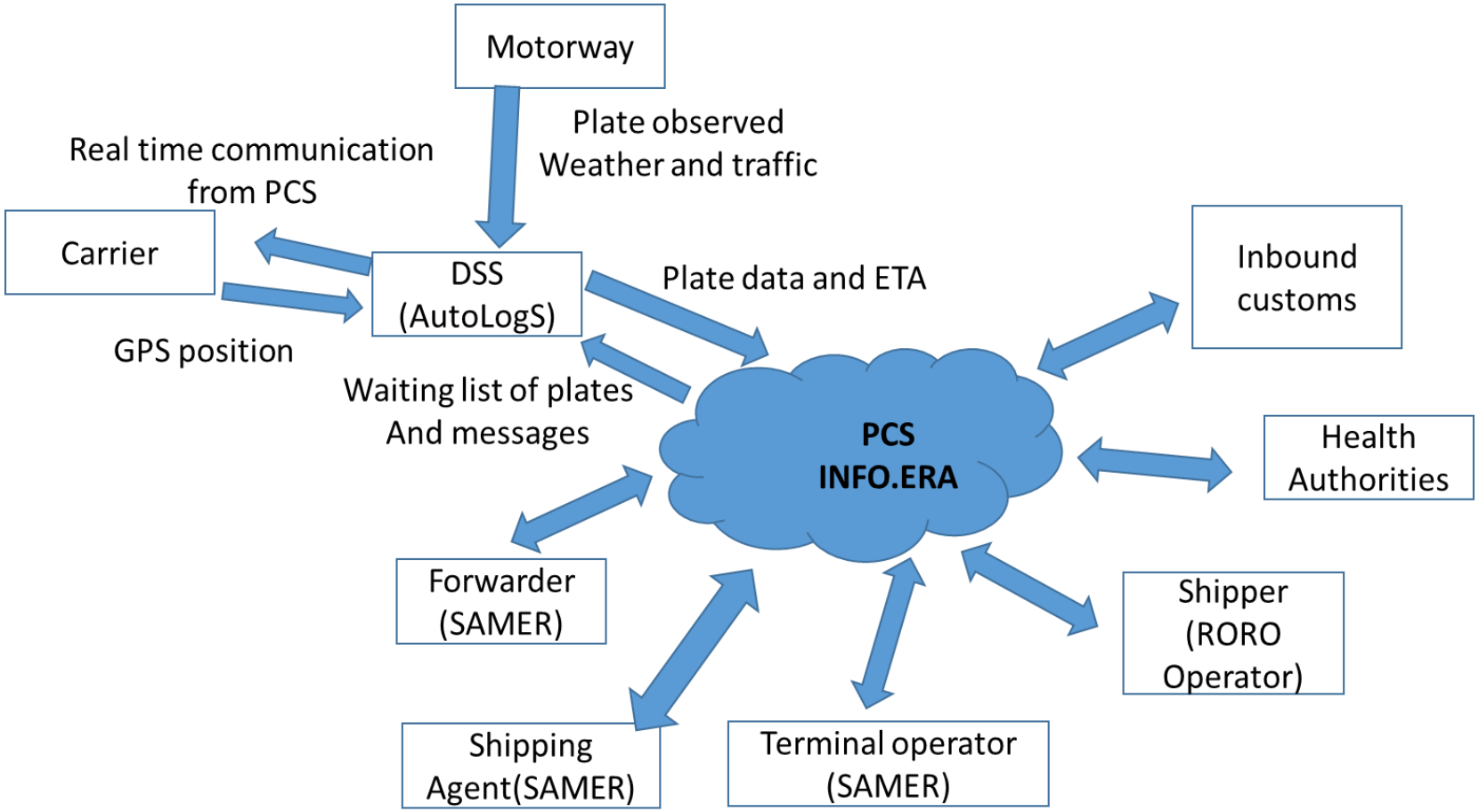
Portability:
the Sinfomar system is platform indipendent.

Flexibility:
A modular architecture allows to have a system easy to expand and adpte to different real systems.

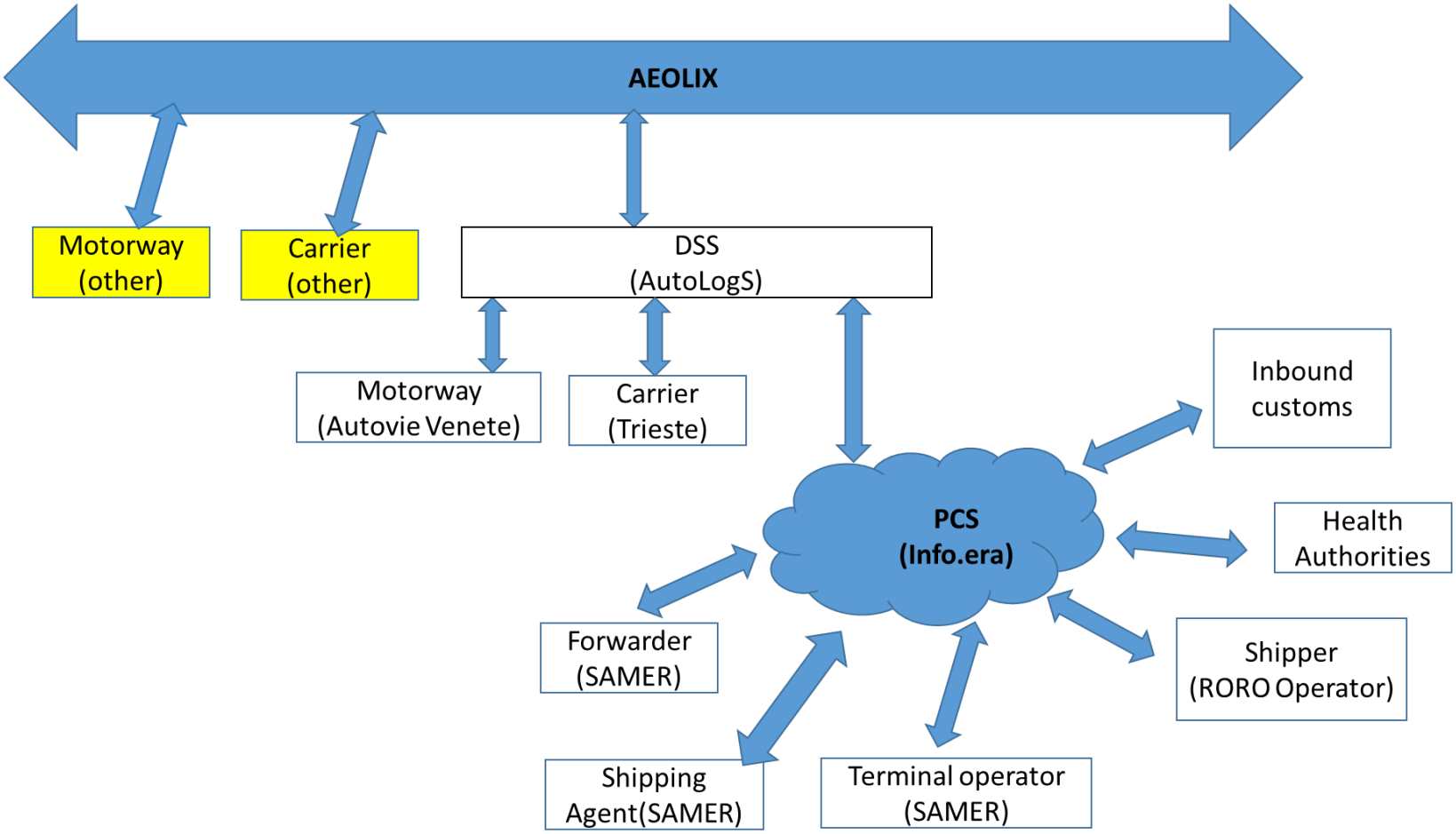
Usability:
the GUI is web based and follows an approach single windows able to access Sinfomar data and data collected from already existing applications.

Performance:
the system analyses multi sources real time data to provide inegrated elaboration statics for end users devices.

Software infrastructure AS IS

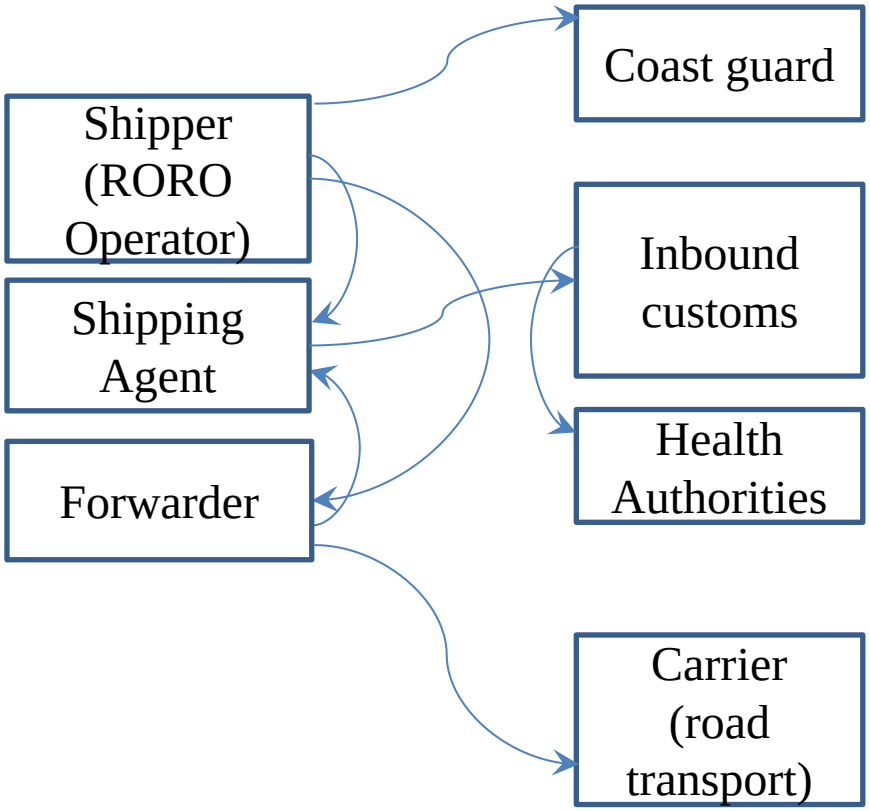


Software infrastructure TO BE



Information exchanged AS IS

IMPORT



Actor	Functional Role CURRENT DATA EXCHANGE
Shippers	Provide vessels information Provide freight information - Vehicles and shipments on the vehicle - Manifest document
Customs	Collect and elaborate freight data Perform clearing operations Perform security and safety risk analysis
Freight forwarders (SAMER)	Provide freight data to the shipping agent Collect data necessary for the freight road and rail transport
Shipping agents (SAMER)	Provide freight data to the customs Collect all the essential data on the freight boarded on the vessel
Freight carriers	Receive freight data from the freight forwarder in order to perform road transport
Ministry of Health	Receives security and safety risk analysis results from the customs Performs health inspections on freight
Coast Guard	Monitors vessel status

Innovation through AEOLIX

DIGITAL PERMISSION TO THE PORT

The carrier will notify the truck arrival by filling an electronic form in the PCS.

REQUIRED DATA:

- Shipment data
- Driver data
- Freight data

DIGITAL PERMISSION TO THE PORT

A “notice of arrival document” is electronically generated by the PCS

→ The following procedure is applied:

↓

- The “notice of arrival document” is sent by e-mail to the carrier, the terminal operator, the driver, the Port Authority and the Customs Agency
- The tractor /trailer license plate is uploaded in a white list of trucks expected to reach the port
- The PCS sends a confirmation of the notice of arrival status to the carrier and, by SMS, to the driver

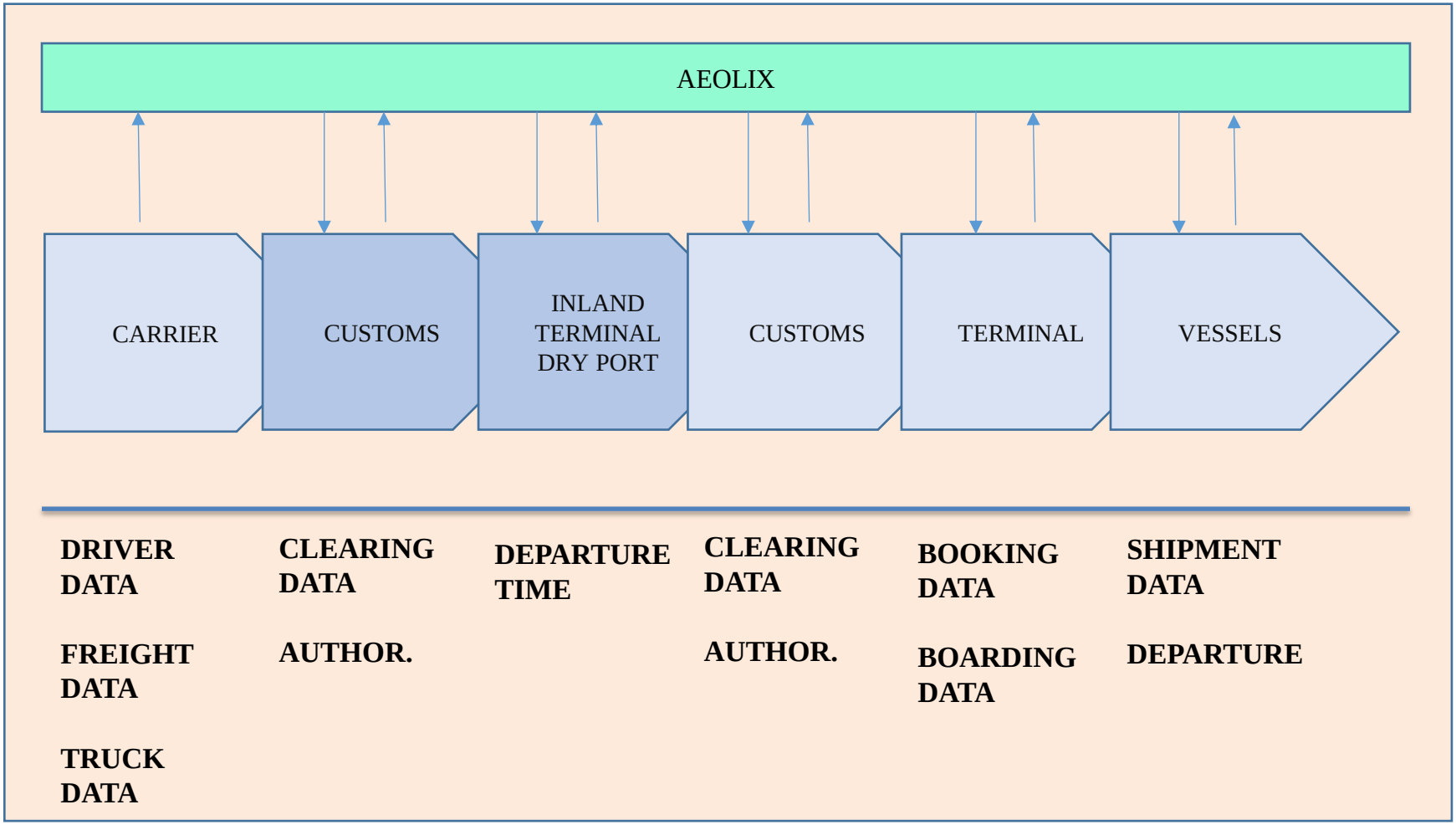
DIGITAL PERMISSION TO THE PORT

The carrier data inserted in the PCS are shared with the Customs Agency AIDA IT system

E-CUSTOMS PROCEDURES ALONG THE VEHICLE TRIP

Data processed by the AIDA system for customs authorizations and verifications

Innovation through AEOLIX



Expected impact

- **10%** REDUCTION of TOTAL TRANSPORT TIME
- **10%** REDUCTION of CO_2 EMISSIONS
- **4%** REDUCTION of the COST associated with intermodal transport
- Improved **flexibility** of intermodal transport

LL4: Partners

ICOOR

Samer&Co. shipping

Interporto di Trieste
Fernetti

info.era

AutoLogS s.r.l.

AUTORITÀ PORTUALE TRIESTE

AUTOVIE VENETE

AGENZIA DELLE DOGANE

Scenarios

Scenario 1.

Logistic chain improvement through smart customs procedures:

secure and smart innovative customs procedures allowing pre-clearing operations for import RO-RO trades between Turkey and continental Europe.

Scenario 2.

Logistic chain improvement through smart customs procedures:

secure and smart innovative customs procedures allowing pre-clearing operations for export RO-RO trades between continental Europe and Turkey.

Secure and paperless data sharing procedures will be introduced.

Scenario 3.

Enhancement of the intermodal transport efficiency and quality:

easy document transfer, booking, status, incident and emergency management across multiple logistics operators transporting freight from continental Europe to Turkey and return passing through the Trieste Living Lab.

SCENARIO 1: Import (Information shared)

1. **Broadcast by Shipper (assume RORO operator)**
- Vessel information (by email)

Subscribers to this information
- Coast Guard

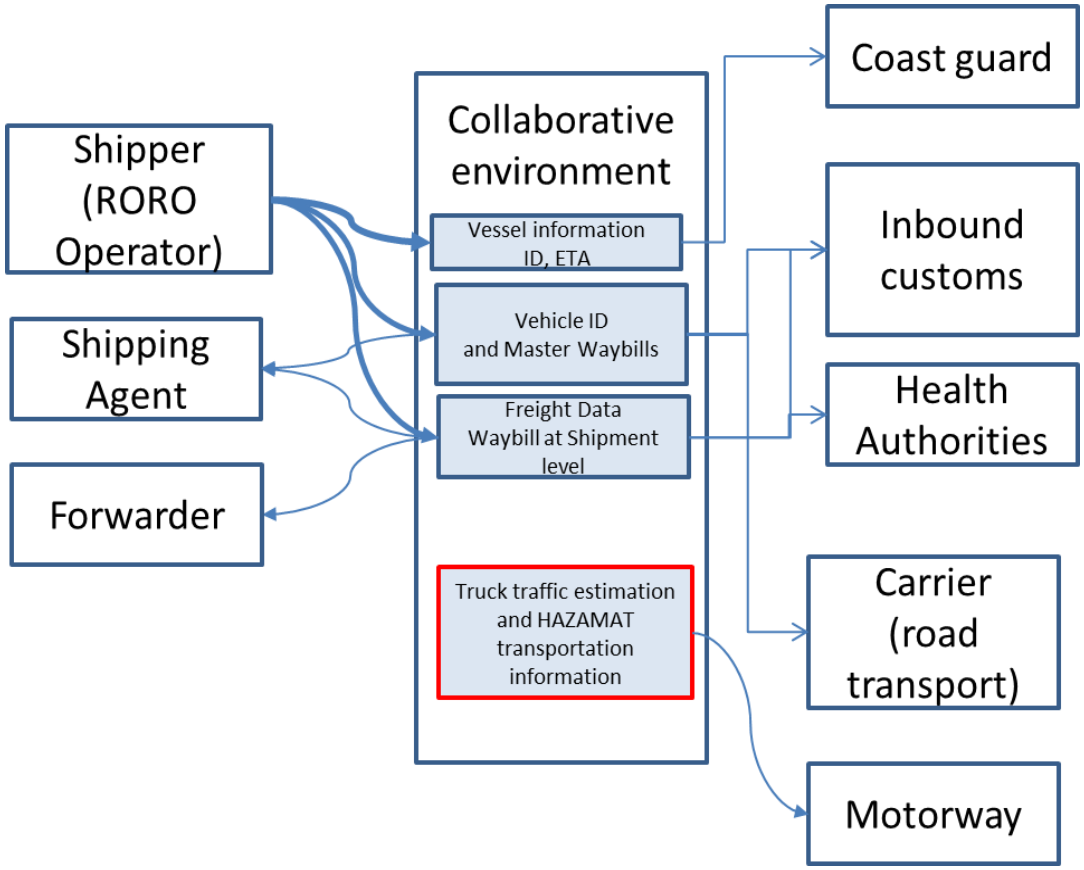
2. **Broadcast by Shipper (assume RORO operator)**
- Freight information (by email)
  - Vehicle information (Truck ID) and related Waybill list
  - Waybills at shipment level

Subscribers to this information (by role)
- Inbound customs
- Shipping Agent
- Forwarder
- Carrier
- Health Authorities
- Forwarder 2 ordering trucks

3. **Broadcast by Collaborative environment (AEOLIX platform)**

- Truck traffic estimation and HAZAMAT transportation information

Subscribers to this information (by role)
- Motorway
- Carrier road transport



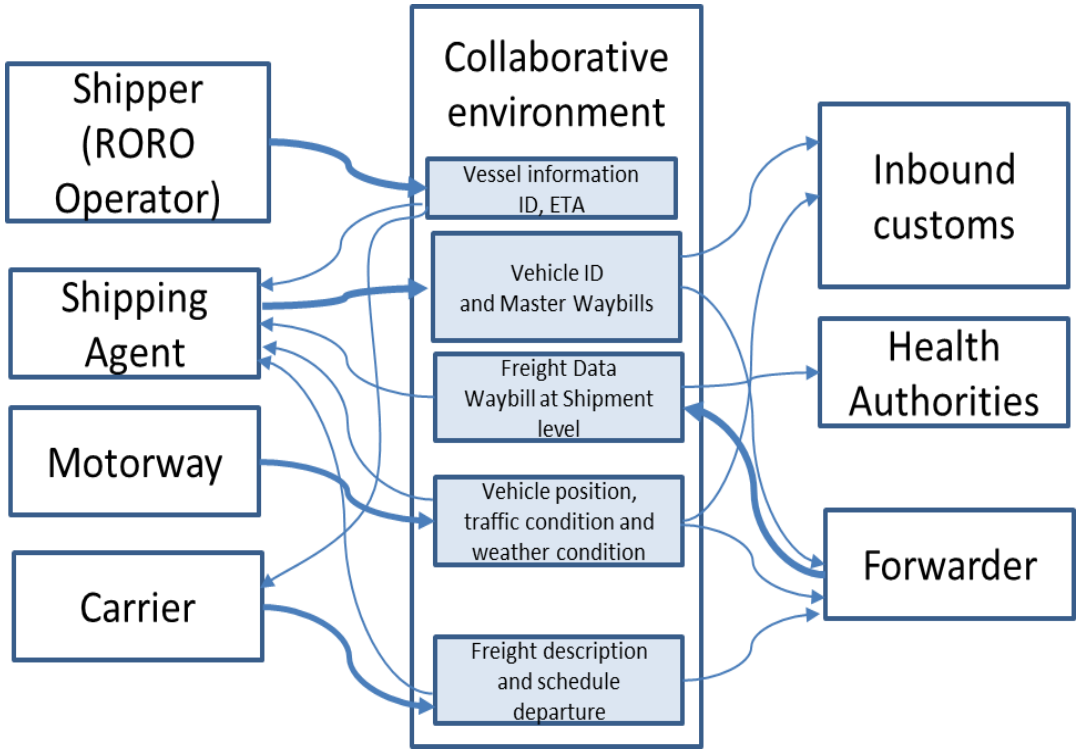
SCENARIO 2: Export (Information shared)

1. **Broadcast by Motorway operator**
- Vehicle position
- Traffic condition (datex 2)
- Weather condition (datex 2)

Subscribers to this information
- Forwarder
- Customs (vehicle position)
- Shipping agent

2. **Carrier**
- Freight information
- Schedule information
- Position (with on-board app)

Subscribers to this information
- Inbound customs
- Shipping Agent
- Forwarder



SCENARIO 2: Export (Information shared)

3. **Shipping Agent**

- Vehicle ID (booking data)
- Master Waybills

Subscribers to this information
- Inbound customs
- Forwarder

4. **Shipper**

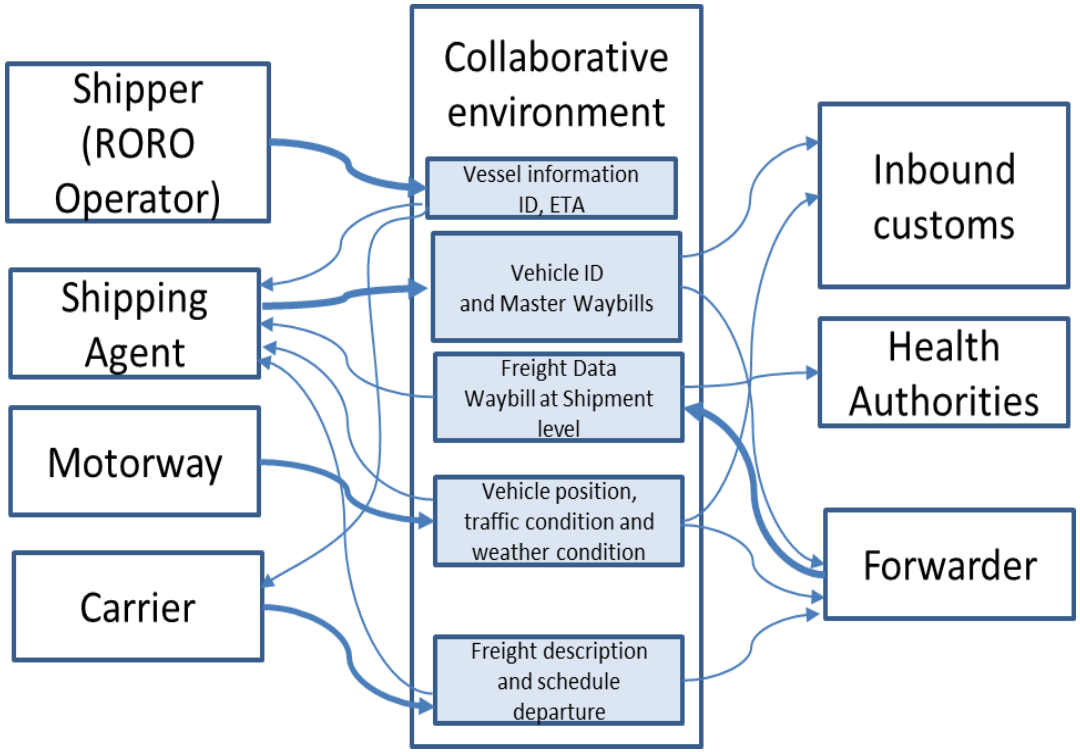
- Vessel information
- ETA

Subscribers to this information
- Shipping Agent
- Carrier

5. **Forwarder**

- Freight Data
- Waybill at Shipment level

Subscribers to this information
- Shipping Agent
- Health Authorities



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