



**New developments in the dangerous goods data model
lessons learned from the EU project “CORE”**

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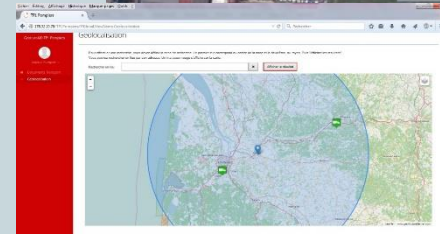
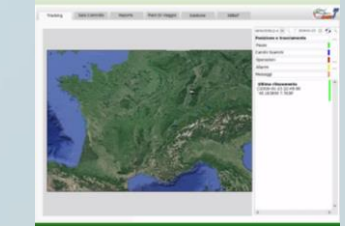
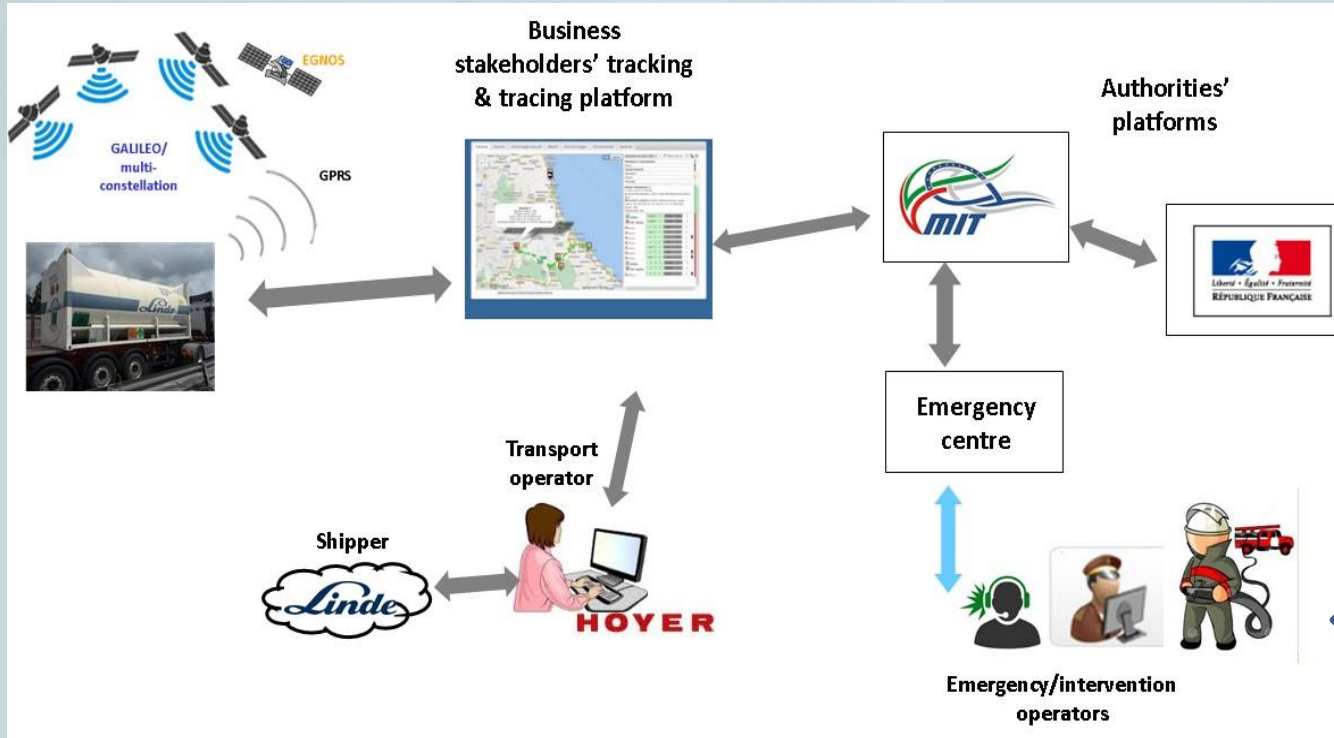
- **Demonstrator overview**
- **Advantages of position**
- **Outcomes, lessons learnt and recommendations**

- **States of play in Italy: CORE architecture and risk assessment**
- **From risk assessment to optimized routing**
- **MIT's vision and next steps**

Demonstrator overview - objectives

- **Validation of TP1/TP2 architecture and data model in national/regional and cross-border operations**
- **Introduction of position (GPS/EGNOS/Galileo/multi-GNSS) for value-added services:**
 - Monitoring, localisation, tracking and tracing
 - eTransport Document
 - Risk assessment and safety
 - Statistics
- **Interoperability aspects for data model, for different use cases:**
 - TAF-TSI (rail)
 - e-CMR (road) and eCall HGV (road)
- **Interests/needs of business stakeholders (transport operators, shippers) and authorities (ministries of transport, regional entities, emergency operators, law enforcement bodies)**

Demonstrator overview - architecture



- Adaptation of available market-driven solutions
- Italian and French Authorities' Platforms
- eTransport Document - unique across modes (road, rail)
- Combination with geospatial data and real-time information from Regions (and dispatching to Regione Piemonte) for risk assessment and emergency

Demonstrator overview - validation

- Real business case, running for about one year (May 2017/April 2018)
- Transport of Argon in tank container from Duisburg (Germany) to Terni (Italy):
 - Intermodal road/rail (tank containers)
 - Business stakeholders/transport operators
 - Authorities/regulators
 - Cross border operations
 - Emergency activation
- Involved stakeholders:
 - LINDE *shipper*
 - HOYER *tank container owner*
 - HOYER *road and intermodal transport operator*
 - HUPAC *rail transport operator and wagon keeper*
 - MIT, 5T (Italy) and MTES (France) *national/regional authorities*



Advantages of position

- **Georeferenced information, for value-added services:**
 - In real-time
 - Based on historical data
- **GPS/EGNOS/Galileo/multi-GNSS (CEN CWA 16390 revision):**
 - Precise
 - Reliable
 - Trustable (Galileo authentication)



Outcomes, lessons learnt and recommendations

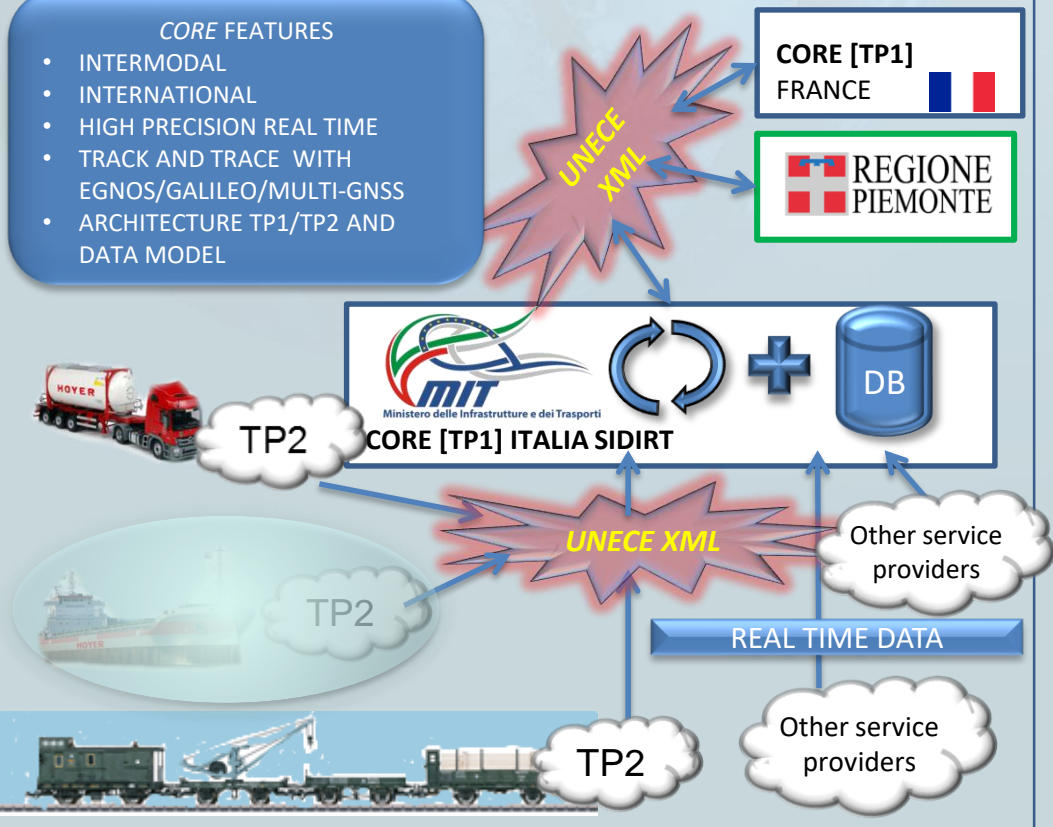
- **Unique eTransport Document across modes → intermodality**
- **Interoperability → the more use cases, the stronger impact assessment**
- **Position/value-added services → business/economic and governmental/social benefits, for adoption and large scale deployment**
- **Adaptation of existing technologies/solutions/systems → sustainability**
- **Reliability, trustability, access/use of data → facilitating acceptance**

- **Coherence with C-ITS developments**
- **Synergies with eFTI to be analysed (e.g. cross-border platforms vs federative platforms, interoperability with TAF-TSI, interoperability with e-CMR)**
- **Advantages of precise/reliable/trustable position to be exploited (e.g. eCall HGV and eTransport Document/law enforcement use cases)**

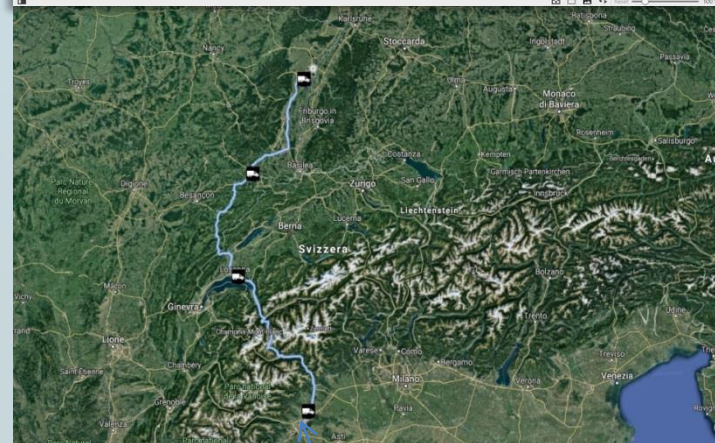
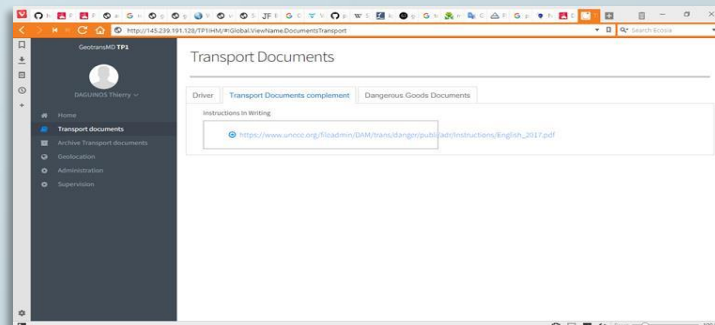
CORE Platform

CORE FEATURES

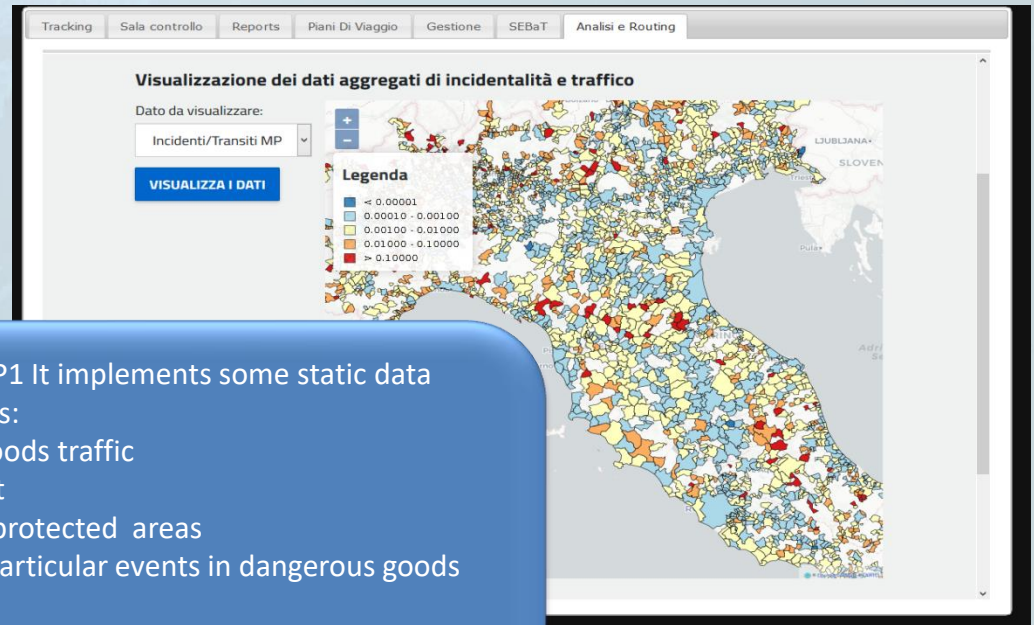
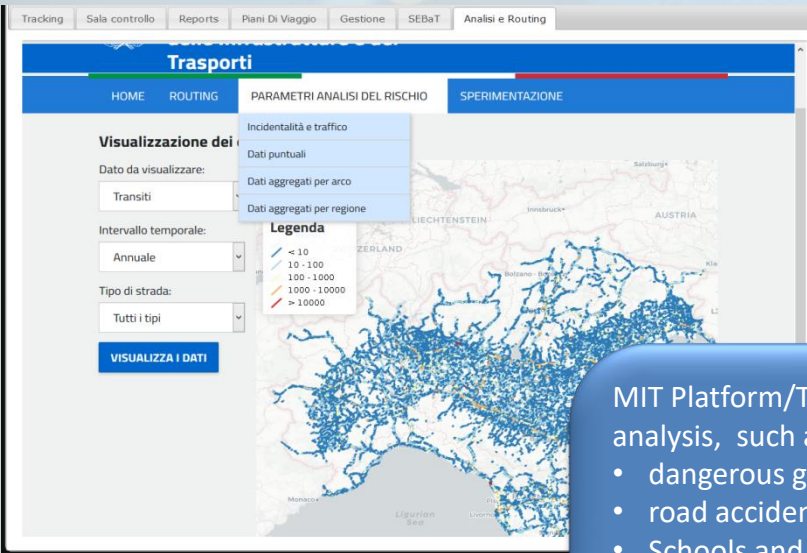
- INTERMODAL
- INTERNATIONAL
- HIGH PRECISION REAL TIME
- TRACK AND TRACE WITH EGNOS/GALILEO/MULTI-GNSS
- ARCHITECTURE TP1/TP2 AND DATA MODEL



- Italian TP1, TP1/TP2 flow and data model in cross-border with France TP1 have been successfully tested for road and rail transports.
- Italian TP1 is operational for road hydrocarbon transports.
- Italian TP1 sends to Regional operation centre DESTINATION tracking and tracing data and receives road gates data.
- Value added functions/services developed/validated.



Descrizione	Varco	Data	Ora	Km/h	Name	Classe	Colore	Targa
mezza pericollata	SM1 - Borgosperto	14/09/15	11:47:54	75.7	30-3082	CL		11 ***** CL
mezza pericollata	TM1 - Borgo d'Ale	14/09/15	11:47:47	69.6	33-1203	CL		11 ***** CL
mezza pericollata	PM1 - Cossato	14/09/15	11:46:34	87.3	30-3082	CL		11 ***** CL
mezza pericollata	PM1 - Cossato	14/09/15	11:46:37	73.0	30-3082	CL		11 ***** CL
mezza pericollata	AT101 - Alghero St	14/09/15	11:47:04	68.5	23-1965	CL		11 ***** CL
mezza pericollata	AP2 - Arona Ceresia	14/09/15	11:46:54	70.8	23-1965	CL		11 ***** CL
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mezza pericollata	PM2 - Cossato	14/09/15	11:45:25	81.3	30-3236	CL		11 ***** CL
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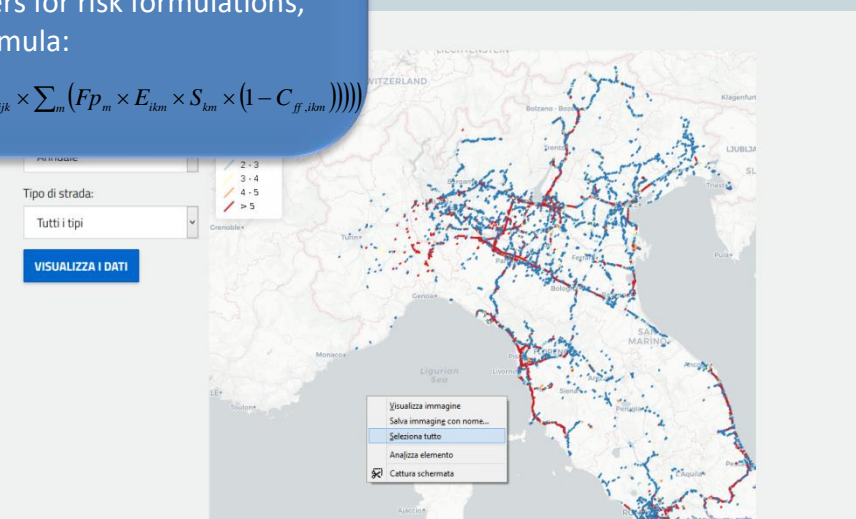
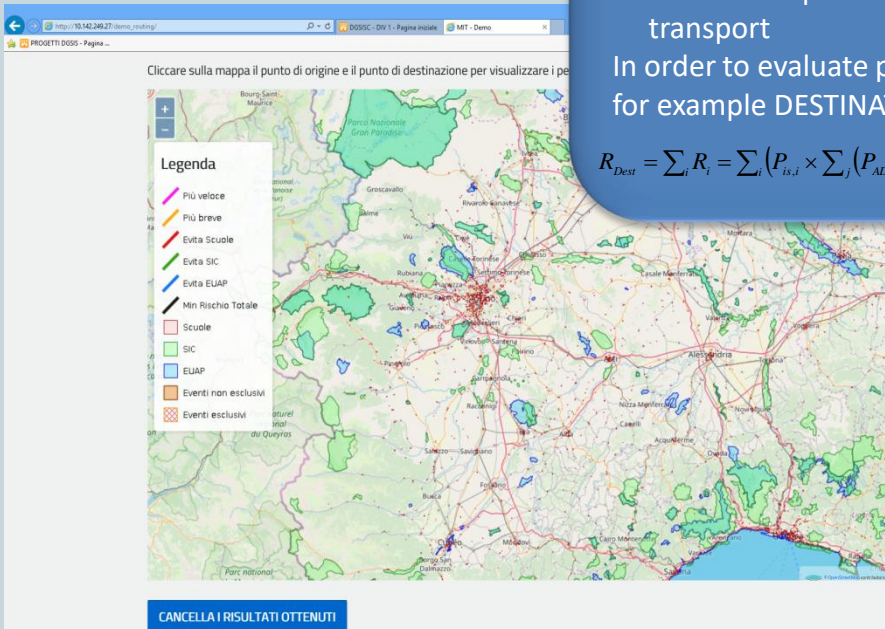


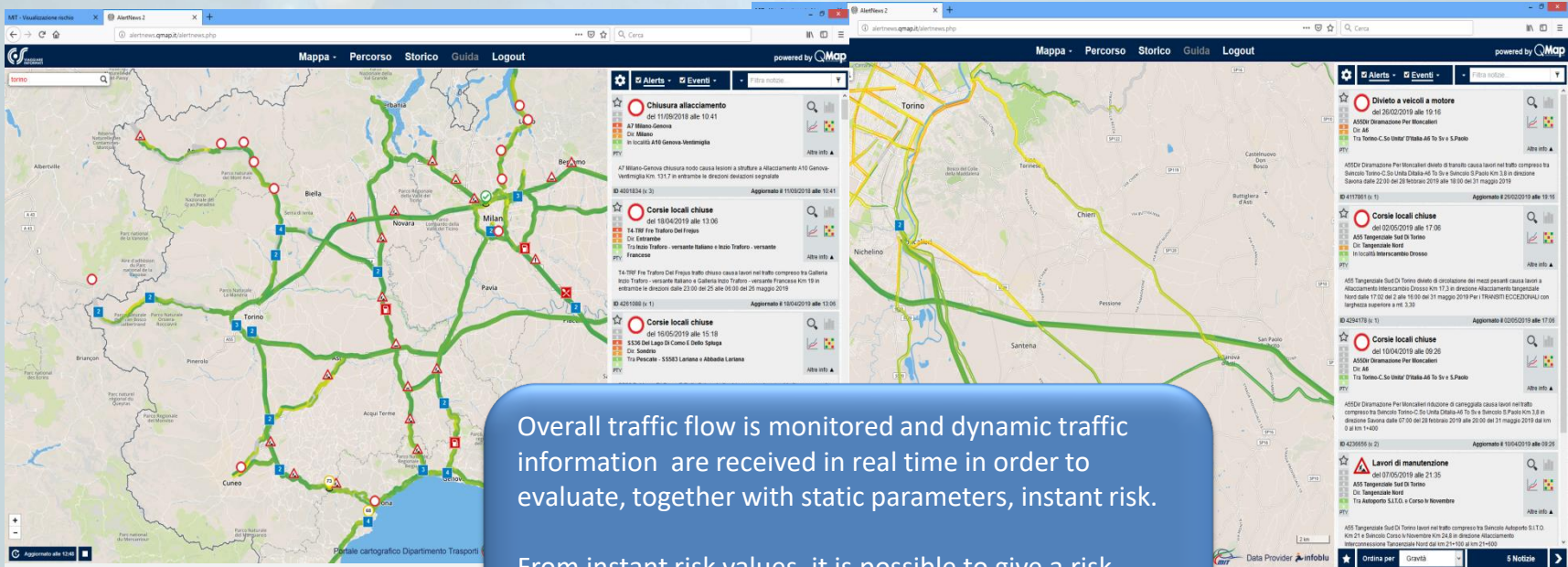
MIT Platform/TP1 It implements some static data analysis, such as:

- dangerous goods traffic
- road accident
- Schools and protected areas
- Alarms and particular events in dangerous goods transport

In order to evaluate parameters for risk formulations, for example DESTINATION formula:

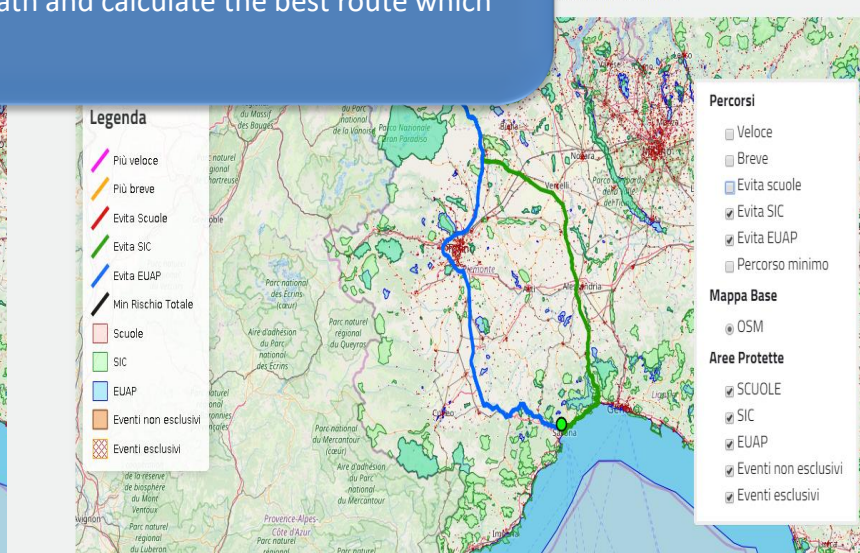
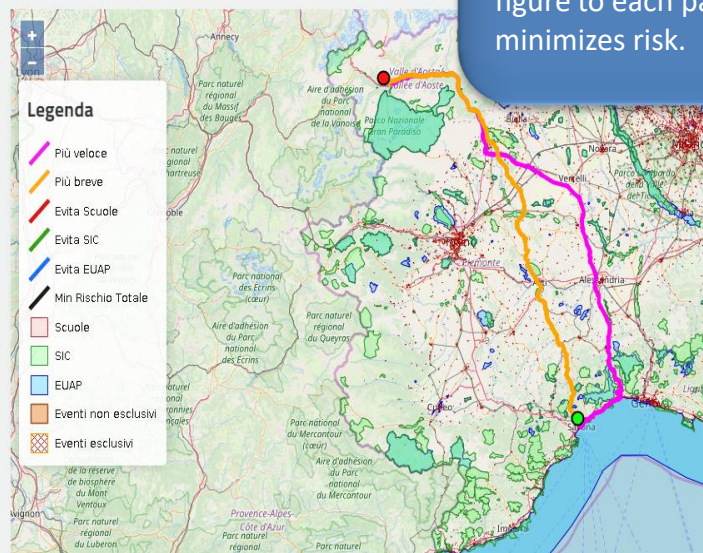
$$R_{Dest} = \sum_i R_i = \sum_i (P_{is,j} \times \sum_j (P_{ADR,ij} \times \sum_k (P_{sc,ijk} \times \sum_m (F_{P_m} \times E_{ikm} \times S_{km} \times (1 - C_{ff,ikm}))))))$$



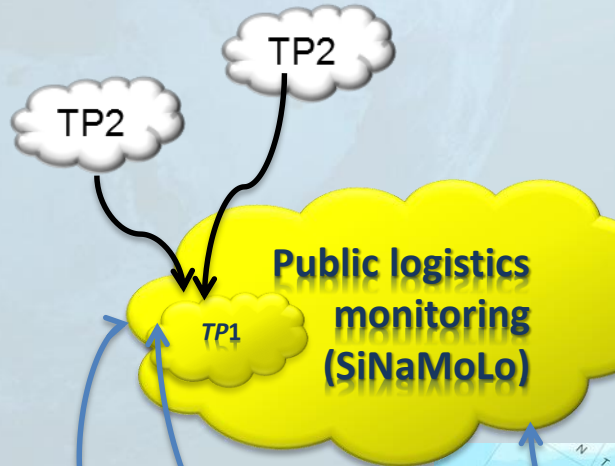


Cliccare sulla mappa il punto di origine e il punto di destinazione per visualizzare

individuati dal sistema.



Actual MIT vision is based on an overall public platform (called SiNaMoLo) which integrates principal Italian logistics systems. This configuration can achieve the best interoperability with public authorities in coherence with Italian law (Digital Administration Code).



PII- PIC
Integrated rail transport platforms

PLN
National logistic platform
TP1

PMIS - PCS
Port Management Information System
Port Community System

FENIX project will create the common multimodal information platform for the supply chains of the multimodal goods transport, which in fact can be seen as an extension of the federative network of platforms.

In particular, Italian pilots are:

- Mediterranean and Baltic-Adriatic and the Motorway of the Sea of South-east -The Trieste Pilot Site (IT 1)
- Dynamic Synchronodal Logistic Modules (IT2) – A toolset for an efficient and sustainable multimodal logistic planning and operations to support and overcome infrastructural deficit





Thank you!

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