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e-Impact: Implementing the e-Freight Framework and e-Delivery Infrastructure

Ambitions

The purpose of the e-Impact project is to implement the e-Freight standard and e-Delivery infrastructure developed in EU funded projects like e-Freight and iCargo in real operations along 3 corridors of the TEN-T Core Network: The Atlantic, Mediterranean and Baltic / Adriatic corridors.

The business cases in the project involve shippers, logistic services providers and authorities.

Benefits for the involved parties are:

- Improved efficiency, by sharing planning and execution data to synchronize inter-modal transport and to optimise loading;
- Reduced costs, by automating data exchange between different stakeholders' systems, including customs and administrations;
- Increased business, by maximizing utilisation of the infrastructures, vehicles and logistics resources in the target corridors.

The business cases will act as forerunners for market adoption and full-scale deployment of e-Freight capabilities on a European and international scale, producing:

- Applied e-Freight solutions demonstrating concrete benefits in industrial implementations, involving regular cargo flows and operational processes;
- Studies assessing the economic viability of e-Freight solutions on the individual stakeholders, on corridor level, and across different corridors of the Core Network;
- Guidelines and requirements for migrating to e-Freight from current systems and architectures, shared and consistent with e-Freight initiatives carried out on European level.

Collaboration has been established with countries in Asia and the project aims to demonstrate interoperability and connectivity between European and Asian stakeholders.

The e-Freight Framework

The Origin

The e-Freight Framework as used in this project is also known as the Common Framework. Its development started in the FREIGHTWISE¹ project as a response to the EU Commissions request for a framework for information exchange in transport and logistics. At the time of FREIGHTWISE, a number of EU projects aimed to develop THE standard framework for information exchange in logistics and make it an international standard. The people involved in these projects understood that collaboration was better than competition, and that led to the joint effort of creating "One Common Framework for Information and Communication Systems in Transport and Logistics".

¹ <http://freightwise.tec-hh.net/>

The projects involved were: FREIGHTWISE, e-Freight, INTEGRITY, Smart-CM, SMARTFREIGHT, EURIDICE, RISING, DiSCwise, iCargo, COMCIS, eMAR and others.

This joint initiative also led to the ambition of making the Common Framework an international standard, ultimately approved by ISO.

The standardisation process started in 2008 through cooperation with the technical committee in OASIS² that was developing version 2.1 of UBL. Much work was involved in adapting the ideas of the Common Framework to the principles of UBL and to provide the required backwards compatibility. Eventually key elements of the Common Framework became part of the official version of UBL 2.1. After making UBL 2.1 complete and official, OASIS started a process of having this standard accepted by ISO. This process was completed late 2015, and elements of the Common (e-Freight) Framework are now part of ISO/IEC 19845.

The Framework

The development of the Framework started by defining the roles that were involved in transport and logistics:

- **Logistics Services Client (LSC)** – associated with the Logistics Demand domain, where demand for logistics services originates and where such services are being purchased.
- **Logistics Services Provider (LSP)** – associated with the Logistics Supply domain, which responds to the demands from LSCs.
- **Transport Network Manager (TNM)** – associated with the Transport Network Management domain and responsible for providing information about availability and status for the transport and logistics infrastructure
- **Transport regulator (TR)** – associated with the Regulation Enforcement domain and responsible for ensuring that transport and logistics operations are being conducted according to rules and regulations.

The scope for the Framework was all transport modes and combination of modes into multimodal services. It was also realised that the role that has been called Freight Services Integrator (FSI) is not a separate role in relation to the ones described above. The FSI characterises an organisation or person that combines the roles of LSC and LSP in order to conduct business. From an information exchange point of view, the FSI does not have any special requirements.

By carefully analysing the information required by these roles to do a proper job, the reference model described in Figure 1 illustrates the domains and a minimum set of electronic documents that are required for operators in the different domains to do their jobs properly.

These electronic documents are:

- Transport Service Description – TSD,
- Transport Execution Plan – TEP,
- Goods Item Itinerary – GII,
- Transportation Status – TS,
- Multimodal eWaybill – MWB,
- Transport Progress Status – TPS, and
- Common Reporting Schema – CRS

² <https://www.oasis-open.org/>

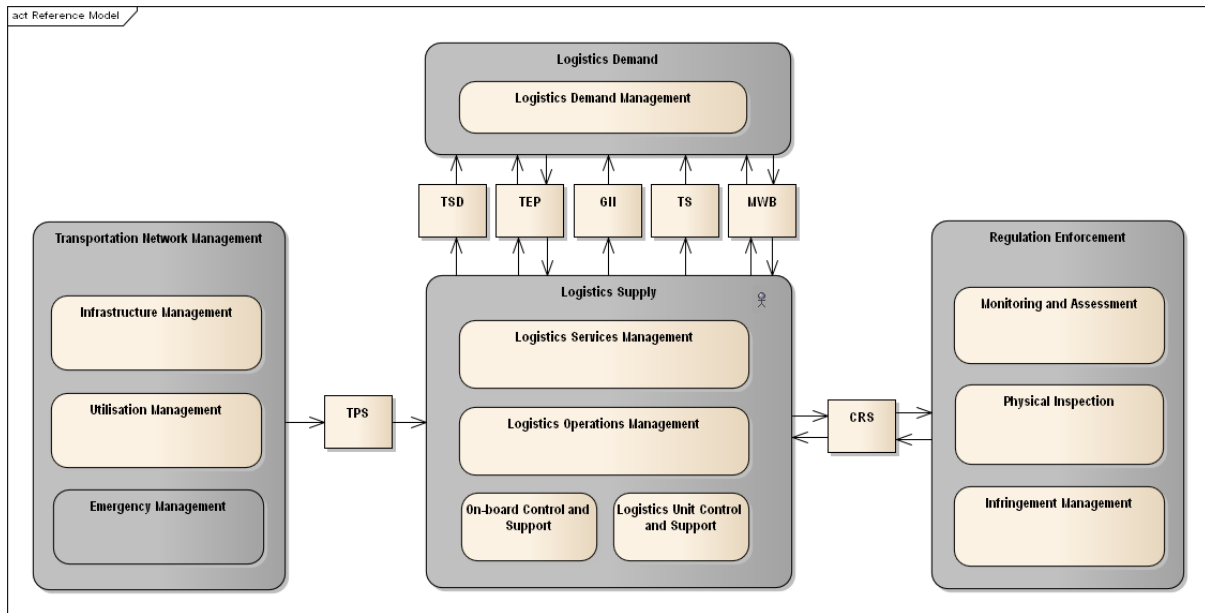


Figure 1 Reference model

The TSD, TEP, GII, TS, and TPS are part of the ISO/IEC 19845 standard.

The e-Delivery Infrastructure

Interoperability and Connectivity – two sides of the same coin

Over the last years, interoperability has been the concern for those involved in transport and logistics development. Despite this, interoperability is still a challenge, especially for SMEs and for those who are serving different industries. The various industry standards (GS1, papiNet, RosettaNet, Odette, etc.) all include transport related messages, and such messages are typically implemented differently by different stakeholders. Despite the fact that ISO/IEC 19845 exists, the other standards will continue to exist and be developed.

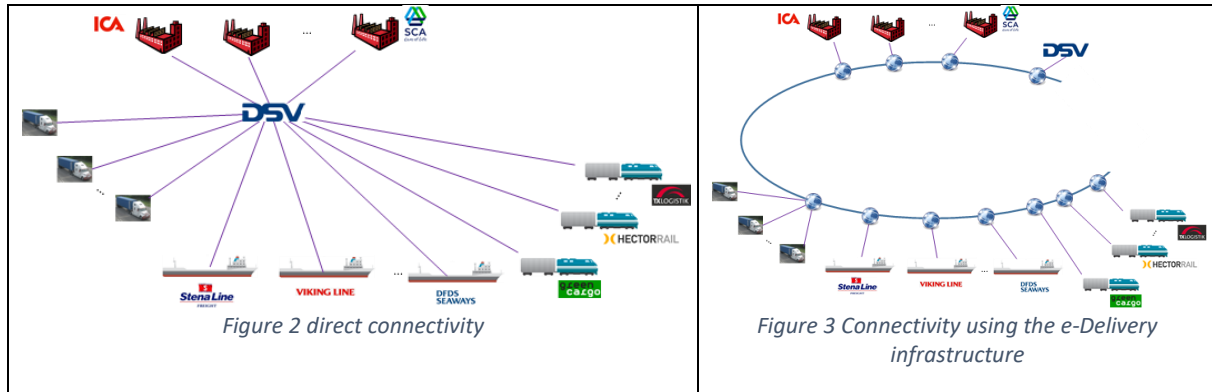
ISO/IEC 19845 is a good example of an activity trying to deal with the interoperability issue. Having an interoperability solution is necessary, but it is not sufficient to enable all, and especially SMEs to be able to easily connect electronically to other stakeholders. Today, the normal approach is to establish direct connection between all stakeholders, as illustrated in Figure 2, using the connections to be made by a freight forwarder (DSV) as an example.

Any company that needs to be communicating with many others will incur significant costs to establish such one-to-one connections to all relationships.

One way of reducing the cost of connectivity is to apply the concept of Access Points³ developed in the e-Freight project, so-called EAPs. The EAP benefit is that each stakeholder connects only once, and, when connected, can communicate with all others, with whom address information has been exchanged (like e-mail). In addition, use of EAPs provides a sufficient level of security, another barrier

³ The e-freight development was inspired by the architecture developed in the EU project PEPPOL. Specifications for the communication layer are found in http://www.peppol.eu/peppol_components/-transport-infrastructure/infrastructure-resources

that has been limiting the interest of electronic information exchange in the transport and logistics community.



EAPs support secure connectivity without a centralised infrastructure.

The infrastructure developed by PEPPOL has now been taken over by DG DIGIT, who is operating it under the name e-Delivery infrastructure. There are now more than 100 providers of access points satisfying the PEPPOL requirements. The project e-Sens⁴ develops new services that are to be deployed using the same e-Delivery infrastructure.

e-Impact Access Points

Experience from the project e-Freight and iCargo has shown that the requirements for real-time responsiveness in logistics were not supported by standard “PEPPOL” access points. Hence, the version of EAPs developed and used in e-Impact has special capabilities for handling real-time information exchange issues, in addition to being standard e-Delivery infrastructure access points. Deployment of the EAPs will, therefore be made using the e-Delivery infrastructure, thereby utilising existing operational support (from DG DIGIT) and the “PEPPOL” governance infrastructure (adapted to logistics requirements).

The Business Cases on e-impact

Trieste

The key purpose of the Trieste business case, see Figure 4 is to link the port to hinterland transportation enabling multimodal journey planning and booking associated to intermodal operations in Trieste (EMT multimodal operator), exploiting the e-Freight Framework. This operation involves Ro-Ro services operated from Turkey and Greece to Trieste and rail connections from Trieste to North Europe, daily linking Italy with Germany, Luxembourg and Switzerland.

The key logistics stakeholders that are involved are:

- Port of Trieste - the meeting point of the trans-European Corridor V and the Adriatic Corridor. It is a gateway position towards East Europe and the Balkans.

⁴ <http://www.esens.eu/>

- Europe Multipurpose Terminal (EMT) is the Terminal operator that manages the intermodal operations and freight traffic involving: RO-RO services from Turkey/Greece to Trieste and train connections from Trieste to North Europe
- Konbivverkehr is the rail operator, future beneficiary of e-impact solution. It organizes most of the railway services from and to EMT terminal.

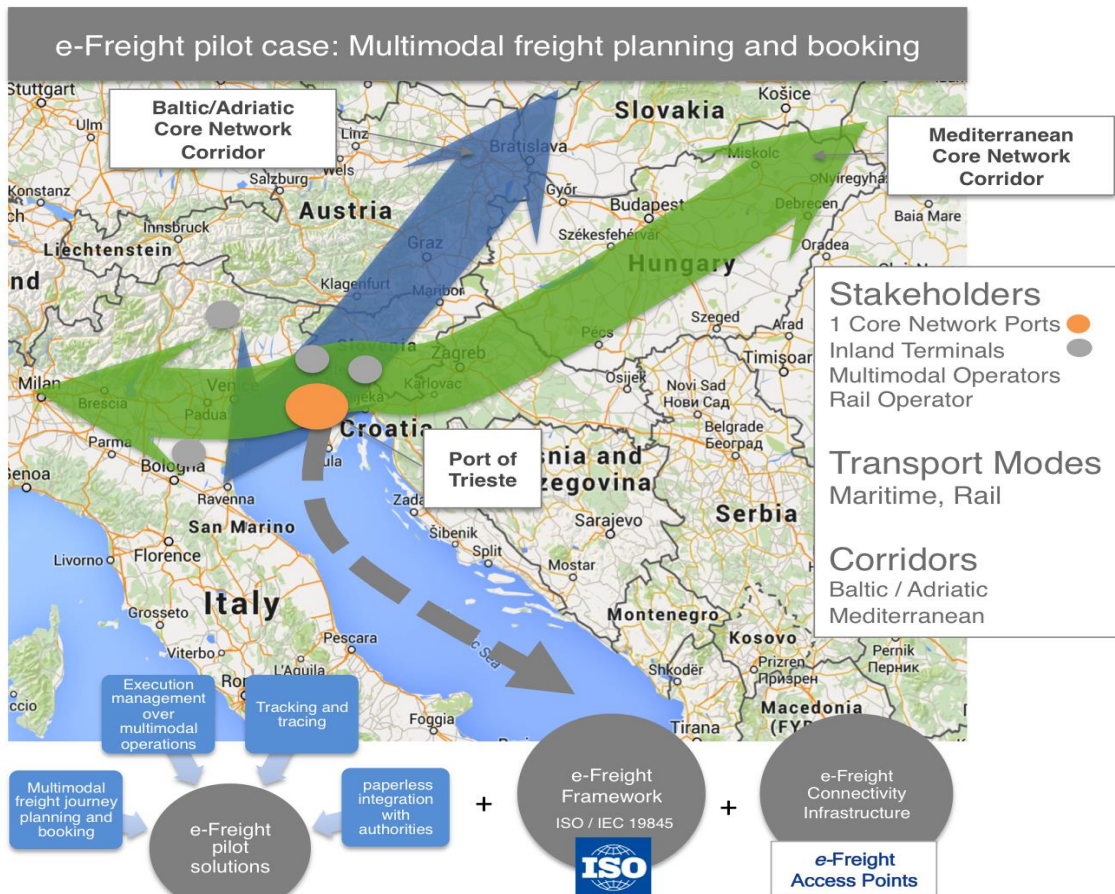


Figure 4 Trieste Business Case

Port of Lisbon

The purpose of the e-Impact business case in Lisbon is to implement multimodal operations planning and execution management over maritime, road, rail and IWT to ensure that cargo efficiently may leave the port as soon as possible after arrival, thereby increasing port capacity without modifying the port infrastructure.

The business case will employ the e-Delivery infrastructure (for logistics) and will be using ISO/IEC 19845 electronic documents as “intermediaries” when providing interoperability between the different stakeholders involved (Port of Lisbon, Inland Terminals, Multimodal Operators, Rail Operator, Freight Forwarders, Rail and Road Infrastructure Managers, and Customs authorities)



Figure 5 Portuguese business case

Port of Leixoes

This business case, see Figure 6, is focused around the adoption of e-Freight principles on the Collaborative e-cargo ecosystem being developed by the port of Leixoes, in collaboration with the port of Lisbon. This ecosystem integrates a set of services, solutions and applications for collaboration and multimodal chain sourcing, booking, planning and execution management over the Atlantic Corridor and also in collaboration with other corridors. All types of stakeholders use it: shippers, freight forwarders, terminal operators, multimodal operators, road transport, rail transport, and air transport ground handlers, among others.

Considering the e-cargo ecosystem context, this business case will contribute to the overall objectives of the action by deploying:

- An e-booking (and publishing environment) for freight forwarders. This will take advantage of the service catalogue of multimodal services (using the ISO/IEC 19845 TSD document), and a solution for door-to-door planning and execution management using the other relevant ISO/IEC electronic documents.
- Low cost transport management applications for SMEs for smartphones with embedded e-Delivery connectivity and interoperability

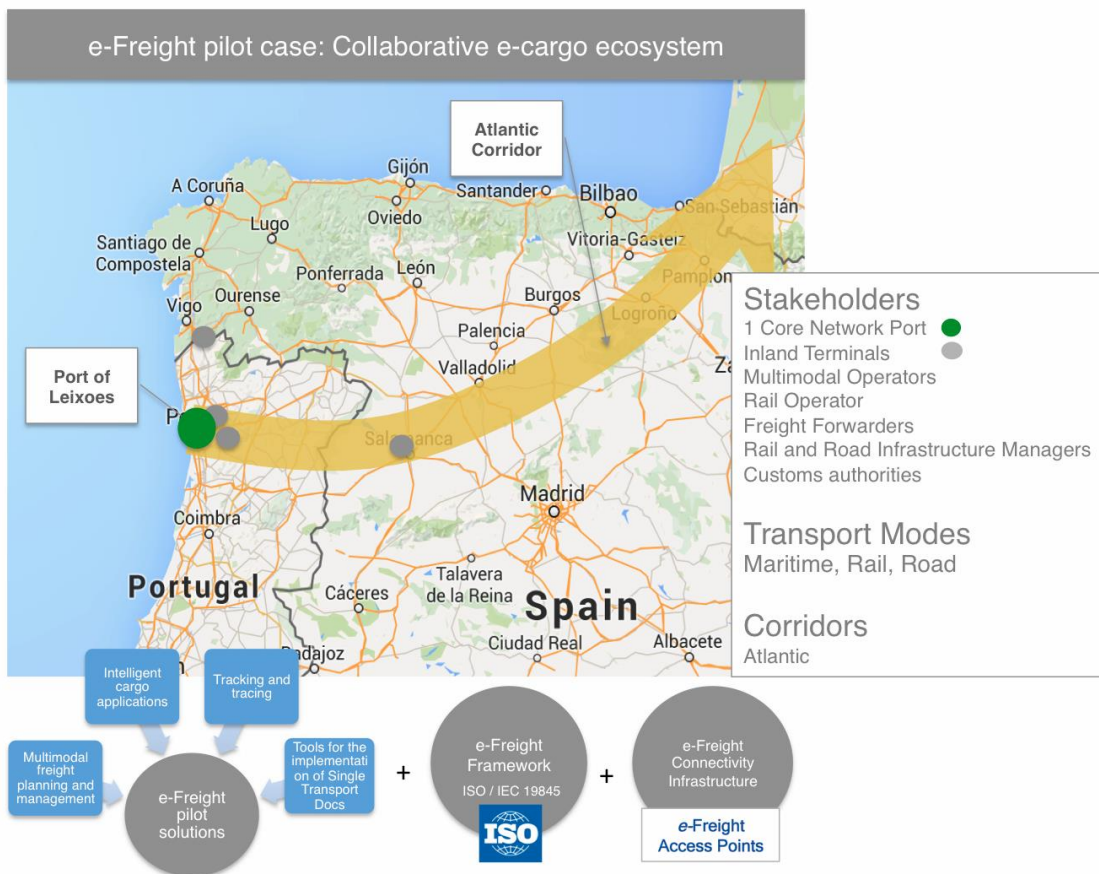


Figure 6 The Port of Leixoes business case

Poland

This business case, see Figure 7, tackles directly one of the missing links of the Baltic / Adriatic Corridor: the lack of traffic management systems being implemented along the corridor and supporting the multimodal connections with the ports.

This missing link is partly reflected in the fact that currently there is no joint approach to management of operations in Polish Sea Ports and related multimodal services. Moreover, there is no capability to properly support electronic data exchange between business, customs and other administration bodies. Companies are either using their own, not-synchronised ICT solutions or they have no ICT tools in use. E-mail, fax, and telephone are the most popular means of data exchange. All of this results in significant inefficiencies in intermodal transport operations in the Polish territory and also in the integration of Polish Ports into the Baltic / Adriatic corridor.

The Polish ports involved are: port of Gdansk, port of Gdynia, port of Szczecin and port of Świnoujście.

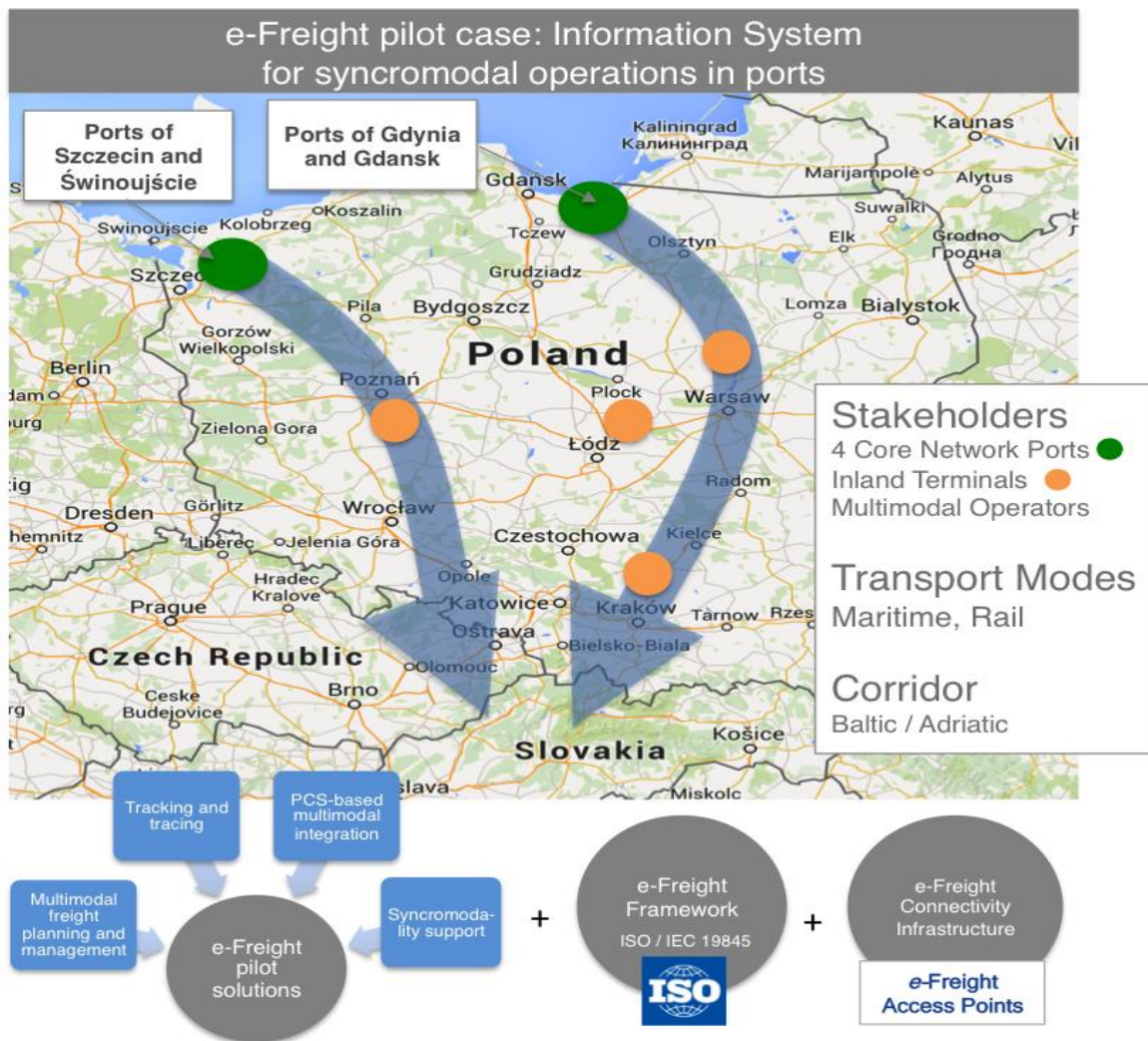


Figure 7 The Polish business case

The e-Freight pilot will also handle paperless reporting to authorities. With this system in place, all parties involved (logistics service providers, shippers, authorities, port administration) will use ISO/IEC 19845 standards.

Linking all business cases

Even though it is not specifically in the description of work, the project aims to link all the business cases and show connectivity and interoperability across Europe.

Extras

There is contact between the e-Impact project, the French organisation AFNET⁵ and the NEAL-NET collaboration between China, Japan and South Korea to use the e-Impact e-Delivery infrastructure and the ISO/IEC 19845 electronic documents to provide connectivity and interoperability between Asia and Europe.

⁵ <http://afnet.fr/>