



D2.2.1

Existing platforms and technical requirements for the architecture of the federated ecosystem

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LIST OF ABBREVIATIONS

| | |
|---------|---|
| A | Activity |
| AEOLIX | Architecture for European Logistics Information exchange |
| A2B | Administration to Business |
| API | Application Program Interface |
| B2A | Business to Administration |
| B2B | Business to Business |
| CE | Connectivity Engine |
| CEF | Connecting Europe Facility |
| C-ITS | Cooperative Intelligent Transport Systems |
| CMP | Corridor management platform |
| DG MOVE | Directorate-General Mobility Transport, MOVE |
| DIH | Data Intelligence Hub |
| DSS | Decision Support System |
| DTLF | Digital Transport and Logistic Forum |
| e-CMR | Electronic Convention des Merchandises par Route |
| EC | European Commission |
| ERP | Enterprise Resource Planning |
| ERTICO | European Road Transport Telematics Implementation Coordination Organisation – Intelligent Transport Systems & Services Europe |
| EU | European Union |
| ETA | Estimated Time of Arrival |
| ETD | Estimated Time of Departure |

| | |
|--------|---|
| FENIX | A European FEderated Network of Information eXchange in Logistics |
| GHG | Greenhouse Gas |
| GLOSA | Green Light Optimal Speed Advice |
| GTFS | General Transit Feed Specification |
| HPCS | Hinterland Port Community System |
| IDS | International Data Spaces |
| INEA | Innovation and Networks Executive Agency |
| ITS | Intelligent Transport Systems |
| LCA | Logistik Center Austria |
| LCC | Load Control Center |
| LCMM | Low Carbon. Mobility. Management |
| MCTO | Multimodal Cargo Transport Optimisation |
| MQTT | Message Queue Telemetry Transport |
| Mxp | Milan Malpensa Airport |
| NAP | National Access Point |
| NLP | Nonlinear Programming |
| OTP | Open Trip Planner |
| PCS | Port Community System |
| PS | Pilot Site |
| PNAEAS | Port Network Authority of the Eastern Adriatic SEA |
| SEA | Esercizi Aeroportuali SEA public limited company |
| SELIS | Shared European Logistics Intelligent Information Space |
| SMIP | Smart Multimodal Information Platform |

| | |
|---------|---|
| Swagger | Open API or OAS—is a type of framework that was designed to describe, produce, visualise, and consume RESTful web services. Referred to "language-agnostic," it has been developed to be read using a common language |
| QAT | Quality Assurance Team |
| REST | Representational State Transfer |
| SOAP | Simple Object Access Protocol |
| TEN-T | Trans-European Transport Network |
| T&L | Transport and Logistics |
| TMS | Transport Management System |
| TOS | Terminal Operating System |
| TRL | Technology Readiness Levels |
| TM2.0 | Traffic Management 2.0 is focused on multimodality and logistics |
| UC | Use Case |
| V2I | Vehicle to Infrastructure |
| VPN | Virtual private Network |
| YTM | You Truck Me |

1. INTRODUCTION

1.1 Purpose of the document

The purpose of this deliverable, entitled "**D2.2.1 Existing platforms and technical requirements for the architecture of the federated ecosystem**" is to provide a complete description of the existing operating platforms for each pilot and their general characteristics and interaction capabilities.

D2.2.1 is part of FENIX Activity 2, titled "**Strategic dialogue, cross-corridors collaboration and pilot roll out preparation**". The main objective of this activity is to implement an iterative approach to develop "corridor information systems" as a federative network of information exchange platforms, in line with DTLF recommendations. The interoperability across the TEN-T corridors is developed along three lines:

- a) technology;
- b) services and implementation;
- c) specification and recommendations for standards.

To achieve this objective, it is necessary to have a good knowledge of the existing situation as the starting point for future discussion.

In particular, the Sub-activity 2.2 "**Common requirements for the federated architecture of platforms**" aims to identify and formulate the common requirements and the needs for the architecture of the federated platforms.

D2.2.1 analyses the available proprietary IT systems and data exchange platforms of all Pilot Sites in order to assess how each local legacy system/platform may access the federated network. Moreover, these IT systems/platforms may also connect other Use Cases and Pilot Sites within the FENIX federated ecosystem, to create an example of a cross corridor Use Case.

It is important to underline that this analysis takes place in collaboration with each Pilot Site, as they provide a detailed description of their current environment and the planned activities for FENIX project. The results from the discussions and the analysis across the Pilot Sites and Use Cases are useful for the development of related deliverables such as D 2.2.2. "**Common requirements for the federated architecture of platforms**" and deliverables in Activity 3 such as D 3.1 "**FENIX Architectural Design Specification**".

1.2 Contractual references

FENIX stands for “A European **F**ederated **N**etwork of **I**nformation **eX**change in Logistics”. FENIX is an action 2018-EU-TM-0077-S under the Grant Agreement number INEA/CEF/TRAN/M2018/1793401 and the project duration is 35 months, effective from 01 April 2019 until 31 March 2022. It is a contract with the Innovation and Networks Executive Agency (INEA) under the powers delegated by the European Commission.

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2. EXECUTIVE SUMMARY

The aim of this deliverable is **to provide an overview and a list of the existing platforms for each Pilot Site.**

The following chapters report the descriptions of the Pilot Site relevant existing platforms and the current functionalities of the main component analysis. It is important to underline that this study takes place in collaboration with all the Pilot Sites, which provide descriptions of their platforms, according to a unified format.

The content of the tables (chapter 3) describes:

- the data format;
- the services offered;
- the existing interconnections;
- the main platform benefits.

To give a clear idea of all FENIX pilots, the descriptive tables in this document are always linked with the previous deliverables, with the Use Cases of D2.1.1 and the services described in the deliverable D2.1.2.

This document contains a section for each Pilot Site in order to facilitate an easy comparison among them. All Pilot Sites, based on the relevant services listed in D2.1.1, describe the platforms to create a range of possibilities for the future federation. After this general list (consisting of tables), an explanation about the selection of the platforms to be federated is provided for each pilot.

In the final section, the common features are inferred in order to facilitate the subsequent work for the future federation of FENIX platforms. In particular, the common requirements of the platforms are the output of this deliverable. These requirements are obtained by considering the most frequent provided services and the exchanged data. Such platform requirements are considered for the specification of the FENIX federation architecture in Deliverable D 2.2.2.

3. RECOGNITION OF THE EXISTING PLATFORMS OF FENIX PILOT SITES

The FENIX Pilot Sites have compiled a unified form for each considered platform to provide the following information: FENIX partners involved in the platform, the services offered, the name of the developer, the data format, the data exchange protocols, the user costs, the existing interconnections with other platforms, the platform's benefits, the accounting rules, the monitoring details and the Use Cases involved.

More precisely, the user costs are the access costs for final users.

3.1 Austria, Fürnitz Pilot Site (South Austria) on the Baltic-Adriatic Corridor

The section of VILLACH/Fürnitz – UDINE – TRIESTE on the Baltic Adriatic corridor is of great importance, as it provides a link between maritime shipments and European supply chains.

This Pilot Site focuses on the activities of the regional working group in the Baltic Adriatic corridor.

The terminal in Villach/Fürnitz is the main intermodal node in the south Austrian region, perfectly connecting the Baltic Adriatic corridor with other major traffic routes and serving as a hub for industrial regions in the catchment area and in the urban areas of Villach and Klagenfurt. The terminal is integrated into the Logistics Hub "Logistics Centre Austria South" which is located in two main transport axes: The Tauern (Munich – Istanbul) and the Baltic-Adriatic (Gdańsk - Bologna) axis.

The Austrian Pilot Site deals with the following Use Cases:

- UC1: Information services;
- UC2: Customs corridor.

The following table provides information on the existing platforms in the Austrian pilot.

3.1.1 Platform AT 1: Terminal System Fürnitz KLV 2000

| | |
|-------------------------|--|
| FENIX partners involved | Austrian partners and LCA Süd |
| Offered services | Management system for the terminal operator |
| Developer's name | Scope Consulting GmbH |
| Data format | XML, CODECO 95B, COEDOR 97A, EDI WESTIM and COPARN |

| | |
|--|---|
| Data exchange protocols | - |
| User costs | Internal system |
| Existing interconnections with other platforms | The existing interface between the KLV 2000 and the eFrachtbrief. The interfaces to the port community systems are under development. |
| Platform benefits for an organisation | Data exchange between TSA Terminals (ÖBB-Terminals) and customers. |
| Accounting rules | Individual, role-based access (company members only). |
| Monitoring details | - |
| Use Cases link | UC1 & UC2 |

Table 1: Austrian Platform 1

3.1.2 Platform AT 2: Traxens

| | |
|--|---|
| FENIX partners involved | Austrian partners and LCA Süd |
| Offered services | Real time track and trace of smart containers |
| Developer's name | Traxens Ltd |
| Data format | / |
| Data exchange protocols | API |
| User costs | TBD |
| Existing interconnections with other platforms | No existing interconnections |
| Platform benefits for an organisation | Real time data brings benefit for: <ul style="list-style-type: none"> - Supply chain efficiency; - Cargo quality; |

| | |
|--------------------|--|
| | <ul style="list-style-type: none"> - Cargo security; - Customs clearance; - Service level; - Trade finance; - Cargo insurance; - Process compliance; - Setting up a smart container service unit at Villach/Fürnitz terminal. |
| Accounting rules | Access only for customers of Traxens |
| Monitoring details | - |
| Use Cases link | UC 1 |

Table 2: Austrian Platform 2

In the Austrian Pilot potential partners have not agreed on sharing information about their platforms. This offers the opportunity to develop a new platform, which is independent of any private company and gives access to all stakeholders at the Austrian Pilot Site. The Austrian Pilot will develop the platform *LISAS service (Logistics Information Service Austria South)* in order to federate information into the FENIX network. In terms of interoperability, security or trust issues, the service will be developed fully in line with the FENIX federation. *LISAS service* will be described in D2.2.2.

3.2 Belgium, Air Cargo Belgium Pilot Site

The Air Cargo Belgium Pilot Site (Be)-implements/pre-deploys/deploys specific Use Cases for the Aircargo community linked to the road feeder transport across TEN-T corridors.

The purpose of the pilot is to optimise the ground handlers' planning for pick-up and delivery of freight linked to the air cargo community across the TEN-T corridors. The following table provides information on the existing platforms in the **Belgium Pilot Site (1)**.

For each platform, the related Use Cases are specified as follows:

- UC1: Reservation of time slot;
- UC2: ETA service;

- UC3: Capacity management;
- UC4: Elimination of waiting times;
- UC5: Parking service;
- UC6: Driver security check integration.

3.2.1 Platform BE 1: BRUcloud

| | |
|---------------------------|--|
| FENIX partners involved | Air Cargo Belgium |
| Offered services | <ul style="list-style-type: none"> - Slot Booking App - Freight Management App - Central Driver Database - Statistics App - Pharma Dashboard - Customs Export App - Equipment Booking App |
| Developer's name | <ul style="list-style-type: none"> - BRUcloud Platform developer: Nallian. - BRUcloud Platform strategic leader taking the initiative: Brussels Airport Company. - BRUcloud Community Support: Air Cargo Belgium. |
| Data format | XML, JSON, B2B (EDIFACT, IATA Cargo IMP/XML) and IE507 stored as SQL/NoSQL. |
| Data exchange protocols | Data sharing via Azure cloud services and Nallian data sharing technology. The main exchange of data is done via API. |
| User costs | Platform cost, App connection cost and variable usage cost per application. |
| Existing interconnections | No existing interconnections. |

| | |
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| with other platforms | |
| Platform benefits for an organisation | Through the applications on the BRUcloud platform, Air Cargo Belgium and all its members have better insight in their performance in the BRUcargo community and can see which problems are the most urgent to address. |
| Accounting rules | The source of the data can define with whom it is shared and in which context (Nallian data sharing technology). |
| Monitoring details | The applications on the platform have reporting functionality to monitor the performance of the BRUcargo community. |
| Use Case link | All UCs |

Table 3: Belgium (1) Platform 1

BRUcloud is a platform that is already operational. The platform will directly connect to FENIX without an external node. The technical description of the BRUcloud platform and its implementation will be defined in D2.2.2 "*Road Feeder Management App*" service, and will be made available to the federation on the BRUcloud platform.

3.3 Belgium, Multimodal Inland Hub-Procter & Gamble-Mechelen-Willebroek Pilot Site

The following table provides information on the existing platform in the **P&G Belgium pilot (2)** and covers the following Use Cases:

- UC1: ETA;
- UC2: Reduction of CO₂ & NO_x emissions;
- UC3: Track & Trace vehicle/shipment;
- UC4: B2A, A2B services like Customs;
- UC5: Dangerous Goods.

3.3.1 Platform 1: OIA Connect

| | |
|--|--|
| FENIX partners involved | Procter & Gamble & OIA Global |
| Offered services | <ul style="list-style-type: none"> - Expected time of arrival (ETA), OIA Connect - Reduction of CO₂ & NOx emissions, OIA Connect - Track & Trace vehicle/shipment, OIA Connect - B2A, A2B services: Customs, OIA Connect - Dangerous goods, OIA Connect |
| Developer's name | <ul style="list-style-type: none"> - OIA Global Ltd: OIA Connect or Hosted by Amazon Web Services. - OIA Connect Authentication: Microsoft and Google. - OIA Connect Primary Data Source or CW1: CargoWise. - Business Intelligence: Power BI. - TMS Atlas: JDA o Primary Data source SAP. - Local IT system (Port of Antwerp Community Systems). - Systems used by the Geodis Customs Broker. - Logit One NV: Logit One Visibility. |
| Data format | SQL, PostGreSQL JSON and XML. |
| Data exchange protocols | Restful APIs, EDI, XML, Webservices (https), Multi Part Messages and JSON Webhooks. |
| User costs | Not yet defined. |
| Existing interconnections with other platforms | OIA Connect is a cloud native visibility application that agnostically consumes and renders data. This strategic position regarding data enables OIA Connect to consume limitless data sources such as ERP, PIMS, WMS and TMS. The agnostic stance enables OIA |

| | |
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| | <p>Connect to serve as an interoperable visibility solution that connects multiple platforms and data sources into a single visibility solution. This enables users to leverage a cloud based multimodal visibility solution while enabling multiple parties to participate collaboratively with data, actions and other critical business decisions. For each customer instance, multiple data sources can be ported and then normalised for OIA Connect through various modern data ingestion techniques and stored in its cloud database. This allows users to treat OIA Connect as a “single source of truth.” The platform is fully interoperable and enables limitless platforms to send and consume data over standard EDI and API connections.</p> <p>Data visualisation platforms, such as Power BI, can be leveraged where visualising KPIs and calculations are required. Charts, graphs and other interactive data visualisations can consume customer data from any 4PL/5PL OIA Connect implementation.</p> <p>Logit One Visibility is an added value service that enhances visibility functionalities of existing operational systems such as OIA. Based on the consultation of multiple data sources, Logit One Visibility interprets these data to improve the abovementioned ‘single truth’. It calculates knock-on effects and automatically feeds information back into OIA or customer portals.</p> |
| Platform benefits for an organisation | Users are provided with a robust workflow management functionality through OIA Connect in |

| | |
|--|---|
| | <p>conjunction with alerts for each participant.</p> <p>These roles and responsibilities can be managed at a micro level (individual) and at a macro level (team).</p> <p>Milestones and other KIPs can be directly tied to specific businesses and actors in the solution, enabling up-to-the-moment business processing.</p> <p>All KIPs and real time calculations are continuously updating within OIA Connect 4PL/5PL solutions.</p> <p>These are the additional benefits for the users of OIA Connect:</p> <ul style="list-style-type: none"> - Data agnostic: can consume limitless data sources and render them in a managed user experience. - Sprint based development, hence, a faster releases and a superior customer experience. - Lower overhead footprint (ease of management). - Reduced costs through containerisation and cloud standards. - Commitment to automated process repair, scale, and faster system deployments. - Managed services providing high operational savings to all participants. <p>The following are additional benefits gained when integrating Logit One Visibility as an added value service:</p> <ul style="list-style-type: none"> - Streamlining the data collection process; |
|--|---|

| | |
|--------------------|---|
| | <ul style="list-style-type: none"> - Dynamic processing of transhipments and port changes; - Integrating SEA and hinterland operations; - Making sense of contradictory information; - Providing a single window experience on visibility data; - Focussing on managing exceptions: being proactive, not reactive. |
| Accounting rules | <ul style="list-style-type: none"> - Individual, role-based access; - User-or transaction-based billing. |
| Monitoring details | <ul style="list-style-type: none"> - Internal System Logs (in order to trace all the operations executed through the platform) viewable by each user. - Alerts, Status Messages. - Performance reporting (availability). |
| Use Case link | All UCs |

Table 4: Belgium (2) platform 1

OIA Connect is a platform that is already operational. The platform will directly connect to the FENIX federation. The technical description of OIA Connect platform and its implementation will be defined in D2.2.2.

3.4 France, French Mediteranean – North SEA Pilot Site

The French Living Lab has two important hubs which are in Marseille and in the North of France. It will demonstrate intelligent Multi Modal Transport on the Mediterranean and the North SEA – Mediterranean TEN-T corridors. Marseille and Fos-sur-Mer are among the biggest ports in the Mediterranean and Dunkerque, Lille, Dourges, Eurotunnel are all important hubs in the North. All of these ports are Multimodal (barges, trains, trucks, and ships). This Living Lab will demonstrate

multimodality and interoperability between all of these ports. The Port of Strasbourg is also an important hub on the North SEA - Mediterranean corridor.

The following table provides information on the existing platforms in the **French Pilot Site** and covers the following Use Cases:

- UC1: Dynamic status slot verification;
- UC2: Slot management;
- UC3: Multimodal ETA for cargo optimisation;
- UC4: Dangerous goods;
- UC5: CO₂ reduction;
- UC6: Customs optimisation;
- UC7: C-ITS for logistics.

3.4.1 Platform FR 1: iDashboard MCTO

| FENIX partners involved | NeoGLS |
|-------------------------|---|
| Offered services | <p>iDashboard MCTO allows to view different information about trucks, barges, trains, vessels coming on a terminal. The information is accessible either in the form of a table or on a map, and is the following:</p> <ul style="list-style-type: none"> - ETA and its calculation date; - The registration of the truck (plate number), vessel, barge and train Carrier; - logistical reference; - additional information sent by the carrier; - position; - transport documents; - customs control required information (link with SELIS platform). |

| | |
|--|---|
| Developer's name | NeoGLS |
| Data format | XML, Json, ASN/GeoNet |
| Data exchange protocols | http, ftp, socket and IF2 |
| User costs | Not yet defined |
| Existing interconnections with other platforms | <p>The iDashboard MCTO is connected with:</p> <ul style="list-style-type: none"> - Noscifel for Multimodal data exchange; - CI5 for data exchange from ports; - C-ITS platforms for road events, data exchange and multimodal data exchange from other countries (an example of these platforms is the ETA), and for the track of the containers; - The AEOLIX platform to receive information from terminal operators, carriers and from the SELIS Platform. |
| Platform benefits for an organisation | <p>The benefits are to offer visibility of data coming from several sources in one platform and in real time. It also offers the access to several services in a customised way, which means adaptable to one's specific needs.</p> |
| Accounting rules | Not yet defined. |
| Monitoring details | Logging system is provided by the system. |
| Use Case link | UC1, UC2, UC3 and UC5. |

Table 5: French platform 1

3.4.2 Platform FR 2: NOSCIFEL

| | |
|-------------------------|--------|
| FENIX partners involved | NeoGLS |
|-------------------------|--------|

| | |
|--|--|
| Offered services | <p>Noscifel offers the following services:</p> <ul style="list-style-type: none"> - Slot reservation: for example, for a refinery, this service allows the carrier to reserve time slots to fill their tankers. The refinery provides the list of time slots available per dock and the carrier can visualise this information. - CO₂ calculation: this service is an AEOLIX toolkit service. It takes in input and in output the information on the transport for which the customer wants to perform a CO₂ calculation; this service provides the result of the CO₂ calculation. - Transport order management: this service allows the carrier to manage the transport orders, follow the progress (loading, delivery, position of barges or truck) and inform the consignee about the arrival time of the barge or truck. |
| Developer's name | NeoGLS |
| Data format | Datex2, XML, EDIFACT, Json, ASN/GeoNet |
| Data exchange protocols | http, ftp, socket, SOAP and IF2. |
| User costs | Not yet defined |
| Existing interconnections with other platforms | <p>Noscifel is connected with:</p> <ul style="list-style-type: none"> - The iDashboardMCTO for data visibility; - CI5 for data exchange from ports; - The C-ITS platform for road events data exchange and multimodal data exchange from other countries (such us the status of the containers) - The AEOLIX platform, to receive information |

| | |
|---------------------------------------|---|
| | <p>from terminal operators and carriers;</p> <ul style="list-style-type: none"> - NeoGLS TRUSTED PARTY 1 (TP1), to share documents on dangerous goods. |
| Platform benefits for an organisation | Noscifel provides innovative services and tools, which can be reached through AEOLIX or through the iMCTODashboard. |
| Accounting rules | Not yet defined |
| Monitoring details | Logging system is provided by the system. |
| Use Case link | UC1, UC2, UC3, UC5 and UC6. |

Table 6: French platform 2

3.4.3 Platform FR 3: NeoGLS TRUSTED PARTY 1 (TP1)

| | |
|--|--|
| FENIX partners involved | NeoGLS |
| Offered services | NeoGLS TRUSTED PARTY 1 (TP1) offers a platform to manage the documents regarding the transport of dangerous goods and their exchange with other TP1 in the Europe. |
| Developer's name | NeoGLS |
| Data format | Datex2 |
| Data exchange protocols | http and SOAP |
| User costs | Not yet defined |
| Existing interconnections with other platforms | <p>NeoGLS TRUSTED PARTY 1 (TP1) is connected with:</p> <ul style="list-style-type: none"> - Noscifel as TP2: receives information about active transport and shares on demand the documents referring to dangerous goods. - Other TRUSTED PARTY 1 (TP1): on demand the |

| | |
|---------------------------------------|---|
| | documents referring to dangerous goods. |
| Platform benefits for an organisation | NeoGLS is a trusted platform compliant with the regulations on dangerous goods, giving access to information on trucks that are driving in a foreign country. The platform can be used in case of authority controls and accidents. |
| Accounting rules | Not yet defined |
| Monitoring details | Logging system is provided by the system. |
| Use Case link | UC4 and UC7. |

Table 7: French platform 3

3.4.4 Platform FR 4: CI5

| | |
|-------------------------|---|
| FENIX partners involved | MGI |
| Offered services | <p>The CI5 cargo community system allows to manage:</p> <ul style="list-style-type: none"> - Vessels: service and calls; - Cargo: manifest, booking, shipping order, release order, transshipment and transfer; - Customs procedures: Customs declaration, customs authorisation and discrepancy report; - Terminal warehouse: Movement reports and terminal stock accounts; - Administration/monitoring: Tracking (cargo), monitoring (vessel, train, barge), statistics and KPI dashboard; - These functions are applied to every kind of cargo: container (full/empty/FCL/LCL), ro-ro, breakbulk and bulk for every kind of flow |

| | |
|---|---|
| | (import, export, transit and transshipment). |
| Developer's name | Marseille Gyptis international |
| Data format | Json, XML, EDIFACT and flat files (csv). |
| Data exchange protocols | ftp, smtp and http (API). |
| User costs | Fee per cargo unit or customs declaration. |
| Existing interconnections with other platforms (please explain details) | The CI5 platform connects with major shipping agents, terminal operators, with the iDashboard MCTO and Noscifel. |
| Platform benefits for an organisation | The CI5 platform is a cargo community system, which supports supply chains via an innovative system that streamlines good flows and provides door-to-door tracking of goods. The system is used by shipping agents, freight forwarders, inland and maritime terminals, inland carriers, port authorities and control agencies (customs agencies, health and plant, veterinary). CI5 generates a lot of data which can be enriched by additional process like the one provided in the AEOLIX-SELIS platform. |
| Accounting rules | Statistics and invoicing modules are provided by the system. |
| Monitoring details | Logging system is provided by the system. |
| Use Case link | UC1, UC3, UC4, UC5, UC6 and UC7. |

Table 8: French platform 4

3.4.5 Platform FR 5: C-ITS PLATFORM

| | |
|-------------------------|--|
| FENIX partners involved | NeoGLS |
| Offered services | - Supervision of RSUs, OBUs and cellular |

| | |
|--|--|
| | <p>communication</p> <ul style="list-style-type: none"> - Monitoring of C-ITS services - Data exchange with national nodes - Management of security through PKIs - Connection to data flows in real time for the exploitation of automatic Use Cases - Possibility to manually provide road events, VMS messages to the RSUs or national node |
| Developer's name | NeoGLS |
| Data format | Json, CAM, DENM, IVI, POI, SPAT/MAP, Geonet, Datex2, XML and csv. |
| Data exchange protocols | ftp, AMQP, MQTT, socket, http and snmp. |
| User costs | Depends of the options and C-ITS services deployed. |
| Existing interconnections with other platforms | <ul style="list-style-type: none"> - Connected to Noscifel for logistics Use Cases. - Connected to French National Node for C-ITS data exchange. - Connected to several TMSs for data exchange. |
| Platform benefits for an organisation | <p>Proposes most of the Day1 and Day1.5 C-ITS services, which can be integrated in logistics Use Cases.</p> <p>Information such as road events, Variable Messages Signs, parking areas etc. are made available in real time.</p> |
| Accounting rules | Annual contracts with the customers |
| Monitoring details | Logging system is provided by the system |
| Use Case link | UC4, UC7 |

Table 9: French platform 5

The French Pilot Site will federate the existing platforms through the AEOLIX platform, except for the dangerous goods TP1 which will probably be part of a European TP1 architecture that will connect directly to the FENIX ecosystem.

3.5 Germany, Rhine-Alpine Corridor

The Focus of the Rhine-Alpine pilot is to develop and test a collaborative corridor concept grounded on the enhanced availability and use of data among logistics companies and administrations along the Rhine-Alpine corridor.

The following table provides information on the existing platforms in the **German Pilot Site** and covers the following Use Cases:

- UC1: Multimodal Freight Capacity (first/last mile);
- UC2: Intermodal Railway Capacity;
- UC3: Intermodal Corridor Data Hub;
- UC4: Mode free capacity planning (Synchro modality).

3.5.1 Platform GE 1: DIH Data Intelligence Hub

| FENIX partners involved | T-System |
|-------------------------|--|
| Offered services | <ul style="list-style-type: none"> - DIH.Identity provider: Identification and Access Management on identity information (create, maintain, manage and validate). - DIH.Broker: Registration of data, data sources, content, structure quality, etc. - DIH.Connector Connectivity Layer: Trustworthy connectivity and usage control. - DIH.Apps Store: Provision of Data App use through the DIH.Connector. - DIH.Clearing House: clearing and settlement for financial and data exchange transactions. |

| | |
|--|---|
| | <ul style="list-style-type: none"> - DIH.Vocabulary: Managing and offering of vocabularies to annotate and describe datasets. - DIH. Corridor Data Hub dashboard Service to visualise relevant UC data. |
| Developer's name | T-Systems International GmbH |
| Data format | Webservices, e.g. https, MQTT, REST and Multi Part Messages. |
| Data exchange protocols | Webservices, e.g. https, MQTT, REST and Multi Part Messages. |
| User costs | For project use free |
| Existing interconnections with other platforms | - |
| Platform benefits for an organisation | <ul style="list-style-type: none"> - Endless connectivity - Trust between security domains - Governance for data economy - Secure data exchange |
| Accounting rules | <ul style="list-style-type: none"> - Role Model - Broker - IDM - see IDS Reference Architecture |
| Monitoring details | Log File, in order to trace all the operations executed through the platform. |
| Use Case link | All |

Table 10: German platform 1

3.5.2 Platform GE 2: RNE TIS

| | |
|--|---|
| FENIX partners involved | TX |
| Offered services | Data on real-time train status (actual) from various national IMs (e.g. RFI, Leidis). |
| Developer's name | Rail Net Europe |
| Data format | TAF/TAP and TSI-compliant |
| Data exchange protocols | XML |
| User costs | <ul style="list-style-type: none"> - Setup: 6500 EUR, monthly 900 EUR. - Licence: 4000 EU, 2400 EUR p.a. - Location Database, Webservice setup: 1400 EUR, monthly 900 EUR. |
| Existing interconnections with other platforms | National IM systems (e.g. RFI, DB Netz, Leidis) |
| Platform benefits for an organisation | Near/real-time access to European IM data |
| Accounting rules | RU role (individual/technical) bases and individual role based. |
| Monitoring details | Performance reporting (availability) |
| Use Case link | UC4 |

Table 11: German platform 2

3.5.3 Platform GE 3: TX Core

| | |
|-------------------------|--|
| FENIX partners involved | TX |
| Offered services | Order and booking management for intermodal loading units. |
| Developer's name | Yellowstar |

| | |
|--|--|
| Data format | Oracle, relational database structure. |
| Data exchange protocols | <ul style="list-style-type: none"> - HTTPS - Restful Services - FTP |
| User costs | TBD |
| Existing interconnections with other platforms | <ul style="list-style-type: none"> - Third party railway operators: transport instructions on the rail carriage, feedback on updates such as accepted, rejected, loaded, gate-in / out etc. - Catkin communication platform: orders/instructions for first/last mile trucking, status feedback from truckers. - Softrail: real-time train status information. |
| Platform benefits for an organisation | <p>Integrated platform with which all the business units of TX are working. This brings benefits such as:</p> <ul style="list-style-type: none"> - An optimised way of working; - Easier reporting / monitoring; - All units are web-based, so there is no limitation on connectivity; - No more maintenance of different modules for each unit. |
| Accounting rules | Individual and role-based access. |
| Monitoring details | LogFiles, Alerts and Status Messages. |
| Use Case link | UC2 and UC4. |

Table 12: German platform 3

3.5.4 Platform GE 4: TX Connect

| | |
|--|--|
| FENIX partners involved | TX |
| Offered services | <ul style="list-style-type: none"> - Enterprise Service Bus - Communication system between mutually interacting software applications (internal/external) |
| Developer's name | Talend |
| Data format | File based, supported with Oracle Database in the background for logging / setting etc. |
| Data exchange protocols | <ul style="list-style-type: none"> - SOAP - Restful - FTP - File Exchange |
| User costs | N/A |
| Existing interconnections with other platforms | <ul style="list-style-type: none"> - TX Core - Softrail - Various TOS |
| Platform benefits for an organisation | <ul style="list-style-type: none"> - Central control tower for all communications - Being able to support any communication type / format - Not depending on one supplier - Faster integration (development as well as processing) |
| Accounting rules | TBD |
| Monitoring details | Performance Monitoring and Status Alerts. |
| Use Case link | UC2, UC3, UC4 and UC5. |

Table 13: German platform 4

3.5.5 Platform GE 5: Softrail Suite

| | |
|--|---|
| FENIX partners involved | TX |
| Offered services | <ul style="list-style-type: none"> - Railway Operating Management System, including skill planning (e.g. for wagon inspector, train driver) - Maintrack (managing and tracking of rolling stock) - Verform (verification of forms for wagon composition, wagon lists, Hermes H30 format) - Logishift (overall planning and tracking of trains, long-term as well as daily operation) - All modules web and mobile based - Dedicated Rail Mobile module (App) for communication with train drivers |
| Developer's name | Binary |
| Data format | TBD |
| Data exchange protocols | XML |
| User costs | N/A |
| Existing interconnections with other platforms | Various IM data e.g. RFI status data and DB Netz (Leidis). |
| Platform benefits for an organisation | <ul style="list-style-type: none"> - Integrated planning and management of trains, including resources and assets; - Ensure compliance with regulations. |
| Accounting rules | Individual, role-based access |
| Monitoring details | Performance monitoring (New Relic) |
| Use Case link | UC4 |

Table 14: German platform 5

3.5.6 Platform GE 5: Softrail Suite - Jplexs – Jan de Rijk Planning, EXecution and Scheduling system

| | |
|--|---|
| FENIX partners involved | JdR |
| Offered services | <ul style="list-style-type: none"> - Planning & Execution transport services - Truck & Rail based transport - Track & Trace - Alerting - Freight Status Reporting - eCMR (experimental) - Control centre operations |
| Developer's name | JdR / Ordina (software development) / Quintiq |
| Data format | Relational database structure |
| Data exchange protocols | <p>Message Integrator (XML based)</p> <p>Collaborative Schedule Integrator (object based)</p> |
| User costs | TBD |
| Existing interconnections with other platforms | <ul style="list-style-type: none"> - TSPportal (charter portal) - TSP connector (direct connections road hauliers) - Rail connector (TX interface) - FSR (freight status report) connector; multiple shippers - TSE (truck status execution) connector - ETA connector (PTV x-server) |
| Platform benefits for an organisation | <p>Integrated platform used by all the business units of JdR for planning & execution of transport services. This system is multi node based and interconnected.</p> <p>Typical benefits for this APS (advanced planning system)</p> |

| | |
|--------------------|--|
| | <p>are:</p> <ul style="list-style-type: none"> - Freight status visibility dashboard; - Truck & Rail status visibility dashboard; - Truck (asset planning and execution); - Automated freight status reporting; - Automated activity and freight-based alerting; - Control centre operations based on (truck)carrier select optimiser. |
| Accounting rules | Individual and role based access. |
| Monitoring details | LogFiles, Alerts and Status Messages. |
| Use Case link | UC4 |

Table 15: German platform 6

3.5.7 Platform GE 7: JdR TSPportal (road-haulier based)

TSPportal – Transport Service Provider web based portal

| | |
|--------------------------------|--|
| FENIX partners involved | JdR |
| Offered services | <ul style="list-style-type: none"> - Freight orders - Carrier assignments - Execution reporting and tracking - Transport documents - Self-billing |
| Developer's name | JdR / ACB (software development Frankfurt) |
| Data format | Relational database structure |
| Data exchange protocols | Message Integrator (XML based) |
| User costs | TBD |
| Existing interconnections with | Jplex (JdR planning system) |

| | |
|---------------------------------------|---|
| other platforms | |
| Platform benefits for an organisation | <p>Integrated platform used by a selection of preferred carriers (road hauliers).</p> <p>Typical benefits for this TSPportal are:</p> <ul style="list-style-type: none"> - Freight transport request; - Freight status visibility dashboard; - Transport documents; - Truck (asset planning and execution); - Direct integration of freight forwarding and status control. |
| Accounting rules | Individual and role based access. |
| Monitoring details | To be developed |
| Use Case link | All |

Table 16: German platform 7

3.5.8 Platform GE 8: JdR Connect (ESB)

| | |
|-------------------------|---|
| FENIX partners involved | JdR |
| Offered services | <ul style="list-style-type: none"> - Enterprise Service Bus - Communication system between mutually interacting software applications (internal/external) |
| Developer's name | MuleSoft / JdR |
| Data format | File based supported with Oracle Database in the background for logging / setting etcetera. |
| Data exchange protocols | <ul style="list-style-type: none"> - SOAP - Restful - (s)FTP - File Exchange |

| | |
|---|---|
| User costs | N/A |
| Existing interconnections with other platforms (please explain details) | <ul style="list-style-type: none"> - Jplexs (JDR) - TSPportal - Various TSP (road hauliers) - Various LSC (shippers) |
| Platform benefits for an organisation | <ul style="list-style-type: none"> - Central control tower for all communications - Being able to support any communication type / format - Faster integration (development as well as processing) |
| Accounting rules | TBD |
| Monitoring details | Performance Monitoring and Status Alerts. |
| Use Case link | UC1 and UC4. |

Table 17: German platform 8

3.5.9 Platform GE 9: PTV Platform - standard service offering

| | |
|-------------------------|--|
| FENIX partners involved | PTV |
| Offered services | <ul style="list-style-type: none"> - Services for geocoding - Mapping - Routing - Transport and logistics planning and optimisation - Calculation of CO₂, tolling and costs - ETA calculation and trip execution. |
| Developer's name | PTV |
| Data format | SQL Express DB and Mongo DB |

| | |
|--|--|
| Data exchange protocols | HTTPS API: JSON and XML |
| User costs | The pricing depends on the service and the Use Case. Different pricing options are flat rate and the transaction based pricing. For non-commercial testing, FENIX is free of charge. Special rates are applied for commercial Use Cases within FENIX. |
| Existing interconnections with other platforms | Services to be integrated in different Use Cases. |
| Platform benefits for an organisation | <ul style="list-style-type: none"> - An integrated platform to expose the services to consumers - An optimised way of exposing service offers - Easier interaction with customers - Everything is web-based - There is a single point of contact (customer care, billing) - No more maintenance of different modules / products - Scalability |
| Accounting rules | Token based access |
| Monitoring details | LogFiles, Alerts and Status Messages. |
| Relevant Use Cases | UC1, UC2, UC4 and UC5. |

Table 18: German platform 9

3.5.10 Platform GE 10: PTV Intermodal Platform

| | |
|-------------------------|-----|
| FENIX partners involved | PTV |
|-------------------------|-----|

| | |
|--|--|
| Offered services | <ul style="list-style-type: none"> - Intermodal route planning, intermodal planning and optimisation service. Integration into PTV planning application “PTV Route Optimiser”. - Intermodal data and data management with various interfaces of data supply for service providers. |
| Developer’s name | PTV |
| Data format | Webserver integrated, JRE 1.8, SQL Server, LP Solver “Gurobi” |
| Data exchange protocols | <p>HTTP & HTTPS</p> <p>API: JSON and XML</p> |
| User costs | <p>There are different pricing options: flat rate and transaction-based rets. Further pricing options are based on envisaged Use Cases and LP solver license model.</p> <p>For non-commercial testing, FENIX is free of charge. Special rates for commercial Use Cases within FENIX are possible.</p> |
| Existing interconnections with other platforms | <ul style="list-style-type: none"> - Interconnection with TMS for routing and optimisation - Interconnection with TMS and TPS for data supply - Interconnection with TX Core for intermodal data supply. |
| Platform benefits for an organisation | The platform offers intermodal routing, transport planning, optimisation and decision support, as well as data consolidation for intermodal data. |

| | |
|--------------------|---|
| Accounting rules | <ul style="list-style-type: none"> - Token based access for Intermodal - License based use of transport planning system Route Optimiser, digital map(s) and LP solver “Gurobi”. |
| Monitoring details | LogFiles, Alerts and Status Messages. |
| Use Case link | UC1, UC2, UC4 and UC5. |

Table 19: German platform 10

The **German pilot** will federate all existing platforms through the DIH-Digital Intelligence Hub, JdR Jplexs, TX Core and the PTV platform.

3.6 Greece, Greece Balkan-Ten-T Network, Adriatic-Ionian Corridor-Cyprus Multimodal Pilot Site

The **Greek Pilot Site** – from now on FENIXGR – will operate as an open innovation community – a Living Lab – where private enterprises, public authorities and research institutions collaborate to facilitate reSEArch-practice integration, and develop solutions for real-life, transport and logistics (T&L) business scenarios and Use Cases.

For each platform, the related Use Cases are specified as follows:

- UC1: Digitalisation of port processes (A2B, B2B, B2A processes);
- UC2: Balanced use of modal availability along the corridor – Intermodality;
- UC3: Monitoring of the status of transport operations;
- UC4: Traffic management and parking availability;
- UC5: Yellow Pages & KPIs;
- UC6: End-to-end provision of logistics services for SMEs along the corridor.

The following table provides information on the existing platforms in the Greek Pilot Site:

3.6.1 Platform 1: Hellenic Port Community System

| | |
|-------------------------|---------------------------|
| FENIX partners involved | PCT, PCDC, PEARL and ICCS |
|-------------------------|---------------------------|

| | |
|--|---|
| Offered services | <ul style="list-style-type: none"> - Digital preparation of proof of delivery notes - Customs electronic notification for pending customs clearance - Electronic notifications to transport companies, road transport operators, rail transport operators, cargo owners for pending actions - Secure entry system to Piraeus Free Zone Type I for trucks - Cargo monitoring and electronic notifications for cargo status. |
| Developer's name | PCT/ICCS |
| Data format | Customs import manifest / proprietary data formats |
| Data exchange protocols | Restful API and JSON calls |
| User costs | Not yet defined |
| Existing interconnections with other platforms | <p>The Hellenic Port Community System has multiple interconnections with legacy platforms from all stakeholders. These include:</p> <ul style="list-style-type: none"> - Terminal Operating Systems – Terminal Operators; - Shipping Agent Cargo Platforms – Shipping Agents; - Warehouse Managements Systems – Warehouse Operators; - Free Zone Management Systems – Free Zone Operators; - AutoGate Systems – Terminal Operators; - Customs Cargo Release – Customs Office. |

| | |
|---------------------------------------|---|
| Platform benefits for an organisation | Improvement of import/export processes and availability of high-end services that require significant cost to local SMEs for development and maintenance. |
| Accounting rules | A Single-Sign-On supported by Identity Management across all HPCS modules and integrated platforms. |
| Monitoring details | Access Log Files |
| Use Case link | UC1, UC3 and UC6. |

Table 20: Greek platform 1

3.6.2 Platform 2: Advanced Logistics Integrated System

| | |
|-------------------------|---|
| FENIX partners involved | K+N, Tredit, CERTH/HIT |
| Offered services | <ul style="list-style-type: none"> - The acceptance of incoming orders for order reception - The acceptance of outgoing orders for order delivery - The creation of e-POD information to truckers - The electronic notifications to transport companies to plan pick-ups - The creation of Track & Trace Data - The creation of statuses related to warehousing (Picking, put-away) and transport - The availability of iOd and POD information - The creation of KPIs. |
| Developer's name | Internal resources |
| Data format | XML/proprietary data formats |

| | |
|--|--|
| Data exchange protocols | sFtp, ftp and Http/Https |
| User costs | Not yet defined |
| Existing interconnections with other platforms | <p>Proprietary connections to various stakeholders:</p> <ul style="list-style-type: none"> - iOd; - e-POD; - Warehousing statuses; - KPIs – SLA monitoring; - Incoming Order; - Outgoing Order; - Order pick-up and loading; - Hub-to-Hub truck load information; - Cross-dock orders; - Tracking & Tracing. |
| Platform benefits for an organisation | <p>Extending the customer/partners base by connecting and exchanging information through the platform. The visibility of the value chain which can be exposed through the platform will also be an added value of customers and partners. Synergies can be based on the data available through the platform.</p> |
| Accounting rules | User authentication, usage of Public/Private key. |
| Monitoring details | Log Files |
| Use Case link | UC2, UC3 and UC6. |

Table 21: Greek platform 2

3.6.3 Platform 3: Cargo Bundling Marketplace

| | |
|--|--|
| FENIX partners involved | TREDIT, CERTH/HIT |
| Offered services | <p>The following is a part of the collaborative meta-services platform:</p> <ul style="list-style-type: none"> - The provision of information regarding truck availability; - Collecting Cargo transport requests, as well as truck transport monitoring data; - Visibility of alternatives for exporting companies to choose for their products in the lower available cost.; - The creation of a loading list for each truck and the possibility to share it with Proof-Of-Delivery and tracking applications. |
| Developer's name | TREDIT, CERTH/HIT |
| Data format | Proprietary data format of cargo transport requests and XML format of loading list. |
| Data exchange protocols | SOAP API for exchange with Proof of Delivery and tracking applications, JSON calls towards AEOLIX CE. |
| User costs | Not yet defined |
| Existing interconnections with other platforms | The platform is already using AEOLIX CE to collect cargo transport requests from multiple exporting companies. |
| Platform benefits for an organisation | Road transport operators have better visibility on the available shipments in the greater area of Thessaloniki, thus increasing their load factor and avoiding travelling empty kilometres. At the same time the platform offers multiple alternatives for |

| | |
|--------------------|---|
| | exporting companies to choose for their products at lower available cost. |
| Accounting rules | User authentication |
| Monitoring details | Log Files |
| Use Case link | UC2 and UC6. |

Table 22: Greek platform 3

3.6.4 Platform 4: VFC Virtual Freight Center

| | |
|--|---|
| FENIX partners involved | TREDIT, CERTH/HIT |
| Offered services | <p>The following is a part of the collaborative meta-services platform:</p> <ul style="list-style-type: none"> - The description of warehouse departments and their characteristics; - The provision of the availability of registered warehouses; - The SEArch for warehouse based on multiple criteria; - Real time supply and demand matching for warehousing services; - The management of booking requests; |
| Developer's name | TREDIT, CERTH/HIT |
| Data format | Proprietary data format of warehouse data availability |
| Data exchange protocols | RESTful API and JSON calls towards AEOLIX CE. |
| User costs | Not yet defined |
| Existing interconnections with other platforms | The platform is already using AEOLIX CE to collect warehouse availability from multiple warehouse owners in the area of Thessaloniki. |
| Platform benefits for an organisation | <ul style="list-style-type: none"> - Data sharing to improve the visibility among the relevant actors and provide innovative services in their supply chain. |

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| | <ul style="list-style-type: none"> - LSPs and industrial companies have better visibility on the available capacities in the greater area of Thessaloniki, thus increasing their storage inventory rate. |
| Accounting rules | User authentication and authorisation |
| Monitoring details | Log Files |
| Use Case link | UC10 |

Table 23: Greek platform 4

3.6.5 Platform 5: SELIS Community Node

| | |
|-------------------------|---|
| FENIX partners involved | ILS, CLMS, ICCS/CSLAB, eBOS |
| Offered services | <p>SELIS Community Node:</p> <ul style="list-style-type: none"> - Identity and Access Management; - Pub/Sub communication layer; - Node Management (node metadata configuration tool); - Big Data Analytics toolbox; - Application Development toolset. <p>Big Data Analytics Recipes:</p> <ul style="list-style-type: none"> - ETA for intermodal logistics with Machine Learning; - Delivery Quality prediction with Machine Learning; - KPI extraction and reliability metrics for barge logistics; - Automated Order Forecast Generation; <p>Decision Support Applications & Data Analytics Services:</p> <ul style="list-style-type: none"> - Normalisation engine; - Visibility platform - Route Optimisation & Truck load-factor |

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| | <p>Optimisation;</p> <ul style="list-style-type: none"> - Collaborative Transport Planning; - Automated Notifications Mechanism with Event Processing; - CAPA Mechanism. |
| <p>Developer's name</p> | <p>SELIS Community Node features:</p> <ul style="list-style-type: none"> - Identity and Access Management ICCS/CSLAB; - Pub/Sub communication layer ILS; - Node Management (node metadata configuration tool); - CLMS; - Big Data Analytics toolbox ICCS/CSLAB; - Application Development toolset CLMS; - Big Data Analytics Recipes: ICCS/CSLAB; - ETA for intermodal logistics with Machine Learning; - Delivery Quality prediction with Machine Learning; - KPI extraction and reliability metrics for barge logistics; - Generation of Automated Order Forecast. <p>Decision Support Applications & Data Analytics Services, which include:</p> <ul style="list-style-type: none"> - The normalisation Engine CLMS; - The visibility platform eBOS; - The route Optimisation & Truck load-factor Optimisation CLMS; - The collaborative Transport Planning CLMS; - The Automated Notifications Mechanism with an event; - eBOS processing; |

| | |
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| | - CAPA Mechanism eBOS. |
| Data format | Json |
| Data exchange protocols | Publish/Subscribe (tcp), RESTful APIs (https) and Identity Access Management (Json web token). |
| User costs | Not yet defined |
| Existing interconnections with other platforms | SELIS has been partly connected with AEOLIX as part of a common demonstrator. It was an initial approach to federating different platforms and mainly focussing on federating Identity and Access Management. |
| Platform benefits for an organisation | The SELIS Community Node can be used to securely expose existing services and functionality to a larger number of users. Additionally, users can benefit from the existing services and Big Data Analytics algorithms or use the Node's Big Data Analytics capabilities to build new recipes. |
| Accounting rules | A user authentication with the possibility of to decide who can participate and how (publishing data, read data, write data, access services and applications, etc.). |
| Monitoring details | <ul style="list-style-type: none"> - Platform monitors computational resources, disk and memory use. - Extensive access log. |
| Use Case link | All |

Table 24: Greek platform 5

3.6.6 Platform 6: NAP National Access Point of Greece

| | |
|-------------------------|--|
| FENIX partners involved | Ministry of Infrastructure & Transport, CERTH |
| Offered services | The main purpose of the NAP of Greece is the establishment of a national digital point of access, where ITS-related data (real-time, historical, and |

| | |
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| | <p>static) are organised and enhanced with the appropriate/harmonised metadata to be made available for exchange and reuse.</p> <p>The provided services can be classified as follows:</p> <ul style="list-style-type: none"> - Business to Consumer (B2C): Users of the Greek NAP have access to a variety of ITS-related datasets that can be used for personal or commercial purposes; - Business to Business (B2B): Accredited organisations/users have the ability to offer their ITS-related datasets under various licenses, for free, or under contract, through a secure environment; - Business to Government (B2G): Local governments or central governmental agencies can use the Greek NAP to access ITS-related datasets from accredited organisations or provide their own data. <p>Datasets included in the Greek NAP encompass the requirements of the Delegated Regulations 885/2013, 886/2013, and 926/2015 accompanying the ITS Directive (2010/40/EC).</p> |
| <p>Developer's name</p> | <p>The Hellenic Institute of Transport of the Centre of Research and Development Hellas (HIT-CERTH) is responsible for the Design and Development of the Greek NAP.</p> |
| <p>Data format</p> | <p>Currently available datasets are offered in one or more of the following formats: CSV, XML, GeoJSON, JSON, PBF andSHP.</p> <p>NAP also supports other formats, such as pdf, KML, binary files, etc.</p> |

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| <p>Data exchange protocols</p> | <p>The DATEX II standard is adopted for the exchange of a dataset concerning the content of the VMS across a specific highway segment.</p> <p>All available metadata comply to the Harmonised Metadata Catalogue proposed by the European ITS Platform.</p> |
| <p>User costs</p> | <p>There are no fees for accessing and using the Greek NAP platform, which has been developed solely using open software solutions.</p> <p>Currently all available datasets are offered openly following an appropriate license (e.g. Open Data Commons Open Database License 1.0 or Creative Commons Attribution 4.0).</p> <p>Provisions have been made for the data providers that wish to offer their data under contract or according to other licenses.</p> |
| <p>Existing interconnections with other platforms</p> | <p>The Greek NAP can harvest data from other platforms (including foreign NAPs), if the platform development technology is compatible.</p> |
| <p>Platform benefits for an organisation</p> | <p>The benefits of the Greek NAP are distributed around the whole ITS industry and society. They include the following:</p> <ul style="list-style-type: none"> - Improved comprehension of data: users will have a better understanding concerning the structure, the meaning, and the nature of data; - Improved processability of data: automatic process and manipulation of data by machines; - Improved discoverability of data: Users and machines will be able to automatically discover data; |

| | |
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| | <ul style="list-style-type: none"> - Increased (re)use of data: Increased chances for data to be (re)used by different actors and therefore increased chance for the creation of new services; - Increased trust: Increase the confidence the various actors in order to provide data and services; - Increased linkability: The ability to link various data from various sources; - Increased interoperability: Easier communication and exchange of data between the various actors; - Increased accessibility to data: Users and machines will be able to automatically access a wide variety of up-to-date data; - National and EU policy acceleration; - Data consolidation: Reduction in multiplicity of data sources from a data consumer's perspective; - Decision-making facilitation: Use of available data for business and governance purposes; - Promotion of innovation culture: Acceptance by the public of notions such as data sharing or open/easy access to data for the development of new technologies (e.g. AI); - Sector empowerment; - Cross-sectorial exploitation: Use of transport data by other industries; - Reduced operational costs for (transport/mobility) infrastructure |
|--|--|

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|--------------------|---|
| | owners/operators and users. |
| Accounting rules | <ul style="list-style-type: none"> - Visitors of the Greek NAP can view and access all open data. - Registered members may view and access data to which they have been granted the appropriate rights. User rights are given to selected users by data providers. - Non-organisational accounts are not allowed to provide data. The Greek NAP has the provision to include organisations, through which data may be published and provided. User accounts may be associated with organisations. Such accounts have discrete roles within an organisation, namely those of administrator, editor and member. - The organisational administrator states which other members of an organisation have the right to publish and edit data. |
| Monitoring details | Several aspects of the use of NAP are monitored and use statistics (e.g. dataset ratings, most edited datasets, top tags) are tracked and provided to all interesting parties via the platform. |
| Use Case link | UC4 |

Table 25: Greek platform 6

3.6.7 Platform 7: PEARL Train Operations

| | |
|-------------------------|--|
| FENIX partners involved | PCT, PCDC, PEARL and ICCS |
| Offered services | <ul style="list-style-type: none"> - Missions Timeline (ETD, ETA), Status, Mapping - Electronic Documents (Wagon/Loading List-COPRAR, CIT23, etc.) |

| | |
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| | <ul style="list-style-type: none"> - Missions Mapping (via GPS), Geofencing, Alerts - Train position and composition/synthesis - Monitoring of wagons and electronic notifications of their status and damage reports - Container lists - Statistics (business analytics) |
| Developer's name | PEARL/ IT & Ops Departments |
| Data format | JSON formats |
| Data exchange protocols | Custom Web services and APIs |
| User costs | Not yet defined |
| Existing interconnections with other platforms | <p>The Rail Operations Management Tool has multiple interconnections with legacy platforms from other stakeholders. These include:</p> <ul style="list-style-type: none"> - GPS service provider (POSITREX platform) - VTG Connector - OCEAN Rail Connector (Under Development) |
| Platform benefits for an organisation | <ul style="list-style-type: none"> - Improvement of data exchange processes (minimisation of idle times and human resources needed) - Enhancement of provision in high-end services to the end-user - Minimisation of costs for the development required by a subcontractor to develop such - Minimisation of externalities and internalisation of the knowledge produced by the company itself - Data verification, accuracy and validation. |
| Accounting rules | Single-Sign-On supported by Identity Management |
| Monitoring details | Access Log Files - Dashboards |
| Use Case link | UC1, UC2 and UC6. |

Table 26: Greek platform 7

The Greek Pilot Site has seven existing platforms, but not all will be federated. *Cargo Bundling Marketplace*, *VFC Virtual Freight Center* and *Hellenic Port Community System (Port Community Node)* will be federated through AEOLIX. Furthermore, the pilot will develop another new platform: *Corridor Monitoring Platform*, which consists of local platforms providing services of varying content. The idea is that a cohesive platform is being developed, collecting T&L information (traffic, yellow pages, availability) from different sources along the corridor and the supply chain and In addition, the platform will process and make the information publicly available, under the supervision of the Ministry of Infrastructure and Transport. The platform is under development at this stage, and draws information and tools from the following existing platforms:

- Advanced Logistics Integrated System;
- SELIS Community Node;
- NAP National Access Point of Greece;
- PEARL Train Operations.

More technical details about the *Corridor Monitoring Platform* will be provided in D2.2.2.

3.7 Italy, Trieste Pilot Site: Mediterranean and Baltic-Adriatic and the Motorway of the Sea of South-East

The **Trieste Pilot Site** will operate as a Living Lab, with all the Implementing Bodies collaborating in a systematic co-creation approach and integrated innovation and research processes. These are integrated organically in real Use Cases that involve user communities as sources of creation.

The Trieste Pilot Site will contribute to the IT platform federation with the AEOLIX platform, developed within the H2020 project framework. Furthermore, there is the PCS software Sinfomar, currently used by the Trieste Port Authority and many other local logistic operators.

The following table provides information on the existing platforms in the **Trieste Pilot Site** and covers the following Use Cases:

- UC1: Expected time of arrival (ETA);
- UC2: Reduction of CO₂ & NO_x emissions;
- UC3: Multimodal route planning;
- UC4: Track & Trace vehicle/shipment;
- UC5: TM2.0 for multimodality;

- UC6: Parking booking service;
- UC7: B2A, A2B services like Customs;
- UC8: Dangerous goods/eCall EGNOS/Galileo;
- UC9: Carrier certification & eCMR testing.

3.7.1 Platform IT (1) 1: AEOLIX

| | |
|-------------------------|---|
| FENIX partners involved | POLIBA and Codognotto. |
| Offered services | <ul style="list-style-type: none"> - e-CMR waybill electronic version by IRU - ETA Estimated Time of Arrival by PTV AG - Routing and planning services by PTV AG - CO₂ footprint and emissions monitoring by T-SYSTEMS - Management of the transport of dangerous goods by NeoGLS. |
| Developer's name | <ul style="list-style-type: none"> - Identity Manager: Atos - Connectivity Engine: Atos - Intelligent Dashboard: Giventis - Data Transformation Service (DTS): Atos - Software Development Kit (SDK) and API: Atos - MyAEOLIX (for governance): Atos <p>Toolkits:</p> <ul style="list-style-type: none"> - e-CMR: IRU; - ETA, Estimated Time of Arrival: PTV AG; - Routing and planning services: PTV AG; - CO₂ footprint: T-SYSTEMS; - Dangerous goods transport management: NeoGLS. |
| Data format | Json |
| Data exchange protocols | Publish/Subscribe approach and Identity Management (Json web token). |
| User costs | Internal use |

| | |
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| Existing interconnections with other platforms | The AEOLIX and SELIS consortium started developing and testing end-to-end supply chain visibility across the supply chains. The overarching goal is to streamline logistics operations by developing a cloud-based IT platform for supply chain actors to exchange data and services. The AEOLIX-SELIS approach is the first step towards fully digital transport operations with clear benefits for the transport industry: lower costs and greater transparency, to make logistics more efficient. |
| Platform benefits for an organisation | Through the AEOLIX Platform, it is possible to extend the benefit of the local IT system (Hinterland Port Community Systems) also to a larger number of users, who can benefit from a European platform rather than from a local one. |
| Accounting rules | User authentication with the possibility to decide who can participate and how (producing data, reading...). |
| Monitoring details | Log File to trace all the operations executed through the platform. |
| Use Case link | ALL UCs |

Table 27: Trieste Italian platform 1

3.7.2 Platform IT (1) 2: DBA Green +

| | |
|-------------------------|---|
| FENIX partners involved | DBA PRO |
| Offered services | <ul style="list-style-type: none"> - Forecasting the levels of CO₂ footprint produced by truck activities. This service is managed by VBS's system developed into FENIX. - Visualisation of the different sources of equivalent CO₂ production. |
| Developer's name | DBA PRO |

| | |
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| | |
| Data format | JSON and raw data from sensors. External systems such as VBS expose their data in JSON or XML (web service). |
| Data exchange protocols | Publish/subscribe approach, Identity Management (JWT), MQTT and UDP. |
| User costs | Provided by DBA PRO for use in FENIX. |
| Existing interconnections with other platforms | <p>DBA Green+ is a complex multi-module software platform which operates based on innovative paradigms such as the Internet of Things and Big Data to monitor and to reduce the environmental impact of business activities, such as port areas or inland.</p> <p>The system consists of three main elements:</p> <ol style="list-style-type: none"> 1) data collection developed through a network of sensors distributed in the area to be monitored; 2) data transmission and aggregation into a central system; 3) final analysis, processing and presentation of the collected data, in order to perform predictive analysis about the level of global emissions in the areas in question and support the decision-makers. <p>The platform was designed to be ready to interact with any kind of sensor to build a monitoring matrix to measure:</p> <ol style="list-style-type: none"> a) air, levels of CO, NO, NO2, SO2, O3, and the particulates (PM10, PM2.5), direction and speed of wind, rain, solar radiation, pressure, humidity and temperature; b) water levels of turbidity, dissolved oxygen, Redox potential and conductivity. <p>DBA Green+, moreover, could be integrated with</p> |

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| | sensors at the access gate of the port, used to count and classify vehicles entering and leaving. |
| Platform benefits for an organisation | <p>Mainly DBA Green+ will be used to elaborate data collected from VBS' system.</p> <p>Through the DBA Green+ platform, the functionalities of the local IT system (Port Community System) could be extended in the future, giving the following benefits:</p> <ul style="list-style-type: none"> a) monitoring in real time «water» and «air» environmental matrixes; b) predicting scenarios of potential environmentally critical situations; c) supporting the business decision processes with «what-if» simulation scenarios. |
| Accounting rules | There is a user authentication module based on standard OAuth2 to manage users and their roles into the system. |
| Monitoring details | Netflix Hystrix to monitor the status all micro-services and centralised logging module to trace all operations executed through the platform. |
| Use Case link | UC2 |

Table 28: Trieste Italian platform 2

3.7.3 Platform IT (1) 3: TOS Ro-Ro

| | |
|-------------------------|---|
| FENIX partners involved | DBA LAB S.p.A. |
| Offered services | <ul style="list-style-type: none"> - Train voyage booking service for the South-North route - Vessel voyage booking service for the North-South route - Truck announcement and booking service for the |

| | |
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| | <p>East-West and West-East route</p> <ul style="list-style-type: none"> - Real time track of ITUs inside the terminal and during the loading/unloading activity - Real time tracking of the status voyages |
| Developer's name | DBA PRO |
| Data format | <p>An XML based on UBL 2.1 (Universal Business Language 2.1). UBL 2.1 provides:</p> <ul style="list-style-type: none"> a) a suite of structured business objects; b) a library of XML schemas for reusable data components; c) a set of XML schemes for common logistic business documents such "order" and "invoice". |
| Data exchange protocols | <ul style="list-style-type: none"> - The access point technology implements a standardised message exchange protocol (based on AS4) which ensures a secure and reliable data exchange within the system. - AS4 (Applicability Statement 4) is an open technical specification based on OASIS ebMS 3.0 for the secure and payload-agnostic exchange of data using Web Services. AS4 was chosen by the EU Member States participating in the e-SENS* Large Scale Pilot (LSP) as the primary protocol for B2B, B2A, A2B and A2A message exchange. |
| User costs | Internal use |
| Existing interconnections with other platforms | <p>TOS developed by DBA PRO is an integrated, modular and scalable system for the operative management of intermodal terminals. The software architecture is designed to enable the management of one or more terminals with a single centralised application.</p> <p>TOS is already connected with the Port of Trieste's</p> |

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| | <p>Sinfomar PCS.</p> <p>Starting from the knowledge of ISO IEC 19845 regulation and OASIS UBL standard, the TOS platform was enriched by implementing a multimodal journey planning and booking solution, exploiting the e-Freight framework.</p> <p>Thanks to the e-Freight communication framework, based on the Access Point technology, different intermodal services to external stakeholders (such as truck/vessel/train announcement and booking services) are exposed: ITU Track & Trace service and real time track of trips on road, vessel and train.</p> |
| <p>Platform benefits for an organisation</p> | <p>Thanks to the adoption of e-Freight standards and the AS4 protocol following benefits are guaranteed the:</p> <ul style="list-style-type: none"> a) reduction of the cost of exchanging information between different actors and transport modes along the logistic chain and providing real time updates (visibility) and data collection about goods, persons and vehicles; b) paperless and SEAmless information flows in the chain; c) simplified and reinforced message delivered to the stakeholders; d) more efficient and less polluting freight transport; e) improving the use of multimodal freight transport solutions. |
| <p>Accounting rules</p> | <p>A dedicated user authentication module to manage users and their roles in the system.</p> |
| <p>Monitoring details</p> | <p>A centralised logging module to trace all operations executed through the platform.</p> |

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| Use Case link | UC4 |
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Table 29: Trieste Italian platform 3

3.7.4 Platform IT (1) 4: myCicero platform (within CO-GISTICS)

| | |
|-------------------------|--|
| FENIX partners involved | Pluservice, Infoera, Ferneti, POLIBA and IRU. |
| Offered services | <ul style="list-style-type: none"> - Drivers and company registration, multi-operators web portal by Pluservice - Smart parking payment, myCicero platform and back-end services by Pluservice - Control Access Gate, plate number recognition by Infoera, Ferneti - Integration rest areas along highway at European level, APPs by IRU (TransPark) and Pluservice - Parking and payment list of operations available by Truck Park function. This service is provided by Pluservice and POLIBA - Integration with public transport for drivers, via App by Pluservice - DSS POLIBA. |
| Developer's name | <ul style="list-style-type: none"> - Smart parking and truck park: Pluservice - Identity manager: Pluservice - Parking and payment web services: Pluservice - Web platform and APP: Pluservice - Parking services: Pluservice, Infoera, Ferneti - Multimodal public transport: Pluservice - Verification services: Pluservice - IRU Transpark integration: Pluservice - DSS: POLIBA |
| Data format | Xml and GTFS |

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| Data exchange protocols | Subscribe approach and proprietary protocols |
| User costs | Within CO-GISTICS project was defined a transaction fee. |
| Existing interconnections with other platforms | Truck park service is directly linked to the myCicero platform and its mobility services and tools (booking, payment system, etc.). The interconnections between Pluservice/myCicero platform and Ferneti system (IT, ICT) and DSS have been stopped at the end of the CO-GISTICS project. However, the existing services provided by Pluservice are used in other scenarios. |
| Platform benefits for an organisation | The improvement of the existing platform and services is fundamental for the company to be more competitive at national and European level and to strengthen the logistic skills at organisational and technical level. Pluservice is in contact with hundreds of potential customers in this field and the previous experience within CO-GISTICS allowed Pluservice to re-use the developments done in other contexts. |
| Accounting rules | Authorised Business Users for the technical integration with the possibility to decide who can participate and how. Free access for end-users. |
| Monitoring details | Business Intelligence (Penthao), log file, static reports, Web services defined with university to trace all events and operations executed by the services/platform. |
| Use Case link | UC6 |

Table 30: Trieste Italian platform 4

3.7.5 Platform IT (1) 5: HPCS (Hinterland Port Community System) Sinfomar

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| FENIX partners involved | PNAEAS |
| Offered services | <ul style="list-style-type: none"> - Management of users - Management of vessel cargo manifest - Management of train cargo manifest - Management of shuttle train cargo manifest - Management of sanitary declarations - Management of dangerous goods - Management of taxes for vessel loading/unloading - Management of free zones - Ferry check in with turkey - Management of the pre-arrival notice - Analysis and Statistics |
| Developer's name | Info.Era S.r.l. |
| Data format | XML |
| Data exchange protocols | WS SOAP and SFTP |
| User costs | Free |
| Existing interconnections with other platforms (please explain details) | <ul style="list-style-type: none"> - Web Services SOAP with Rail Cargo Austria: e-Waybill - Web Services SOAP with Società Alpe Adria/Adria Intermodale: Train Cargo Manifest (CH30) - Web Services SOAP with TO Delta: Train Cargo Manifest (CH30) - Web Services SOAP with European Multipurpose Terminal: Train Cargo Manifest (CH30) - Web Services SOAP with local Maritime Agencies: Vessels Cargo Manifest - Web Service SOAP AIDA: customs declarations - Web Services with the University of Trieste |

| | |
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| | developed within the AEOLIX EU project |
| Platform benefits for an organisation | Through the Sinfomar HPCS, the PNAEAS provides an IT tool implementing procedures based on data format and document standards for dematerialised B2A information declarations between private and public actors who are active in the Port of Trieste and its related logistics hubs. |
| Accounting rules | User authentication (user account, login/logout, single sign in for all the HCS modules) |
| Monitoring details | Log File, in order to trace all the Web Service operations executed through the platform, and the confirmation operation related to the vessel's loading/unloading taxes. |
| Use Case link | ALL UCs |

Table 31: Trieste Italian platform 5

3.7.6 Platform IT (1) 6: YouTruckMe

| | |
|-------------------------|--|
| FENIX partners involved | MATRAS Logistica |
| Offered services | <ul style="list-style-type: none"> - Coordination between the point of loading and unloading of trucks referring in particular to the Port of Trieste but also valid in the EU; - ETA, Estimated Time of Arrival, by PTV AG, which monitors the departure and arrival times to the Port of Trieste and other EU destinations; - Monitoring the details of loading goods, inbound/transit to the Port (pallets, goods and containers), including ADR goods; - Routing and planning services (such as customs offices, offices of forwarder, hotels, restaurants, convenient gas points on route and garages); - CO₂ footprint, monitoring of emissions by |

| | |
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| | streamlining the journeys and rationalising stops. |
| Developer's name | Delex web agency – Trieste - Mr Alex Scarleway |
| Data format | - |
| Data exchange protocols | - |
| User costs | Not yet defined |
| Existing interconnections with other platforms | The overarching goal of YOU TRUCK ME (YTM) is to streamline logistics operations by developing a cloud-based IT platform for “transport actors” aimed at exchanging data and services. The YTM approach is the first step towards fully digital transport operations with clear benefits for the transport industry: lower costs and greater transparency. This will make logistics more efficient and contribute to reducing global pollution. |
| Platform benefits for an organisation | Through the YTM it is possible to extend the benefit of the local IT system (Port Community Systems) also to a larger number of users, who can benefit from a European platform rather than a local one. |
| Accounting rules | User authentication with possibility to decide who can participate and how (producing data, reading...) . |
| Monitoring details | Log File to trace all the operations executed through the platform. |
| Use Case link | UC1 and UC4. |

Table 32: Trieste Italian platform 6

3.7.7 Platform IT (1) 7: SINFOMODAL

| | |
|-------------------------|----------------------------|
| FENIX partners involved | Adria Intermodale S.r.l.u. |
| Offered services | - Management of users |

| | |
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| | <ul style="list-style-type: none"> - Transport documents management - Reserved area management - Booking list - Rail and intermodal transport planning - Trains cargo manifest management - Trucking transport order management - Intermodal transport units inventory management - Special equipment inventory management - Transport Monitoring - HPCS interoperability – Train Cargo Manifest (CH30) - Operational Reports |
| Developer's name | Info.Era S.r.l. |
| Data format | XML |
| Data exchange protocols | WS SOAP and SFTP |
| User costs | Free |
| Existing interconnections with other platforms (please explain details) | Web Services SOAP with HCS Sinfomar - Train Cargo Manifest (CH30) |
| Platform benefits for an organisation | Through the Sinfomodal platform the operational activity of an MTO is fully addressed, also enabling data exchange flows with other logistics actors. |
| Accounting rules | User authentication (user account, login/logout, single sign on). |
| Monitoring details | Log File, in order to trace all the Web Service operations executed through the platform, and the confirmation operation related to users. |
| Use Case link | UC3 and UC4. |

Table 33: Trieste Italian platform 7

3.7.8 Platform IT (1) 8: OMNIA

| | |
|--|--|
| FENIX partners involved | SWARCO |
| Offered services | <ul style="list-style-type: none"> - Traffic monitoring - Traffic forecast - Analytic tools - Management of events - Information on mobility - An integration platform - Strategic traffic management - Integration of traffic management 2.0 - V2X features (Central ITS Station for C-ITS) |
| Developer's name | SWARCO |
| Data format | XML/Json |
| Data exchange protocols | RESTful web API and Identity Management (token) |
| User costs | License based/ Feature based |
| Existing interconnections with other platforms | <p>The OMNIA platform is integrating other monitoring platforms and third party devices from other providers:</p> <ul style="list-style-type: none"> - Traffic Controllers: NTCIP, OCIT, STCIP, and so on; - Variable Message Signs: NTCIP, etcetera; Detectors NTCIP; CCTV ONVIF etcetera. <p>Regarding the logistics operations, recent developments are integrating OMNIA with the COG-LO platform (http://www.cog-lo.eu/) where the OMNIA platform is integrated with a Cognitive Advisor in charge of optimising logistics operations for the efficient management of road-operations.</p> |
| Platform benefits for an organisation | Through the OMNIA Platform, it is possible to extend the benefit of the local IT system (Port Community Systems) to an integrated road-operations management, as well as to V2X features leveraging on |

| | |
|--------------------|--|
| | connected vehicles. |
| Accounting rules | User authentication with the possibility to decide who can participate and how (producing data, reading...). |
| Monitoring details | The log information is stored for reporting. |
| Use Case link | UC5 |

Table 34: Trieste Italian platform 8

All existing Trieste platforms will be federated into the FENIX ecosystem, except the two DBA PRO platforms, which will connect to FENIX federation through AEOLIX and Sinfomar.

DBA TOS Ro-Ro (the Terminal Operating System that manages the logistics operations into the terminal) is already and naturally connected with HPCS Sinfomar to exchange mandatory data. This interface will be further developed to exchange new data relating to “TM2.0 for multimodality” and “B2A, A2B services like Customs”. The integration for the “Track & Trace vehicle/shipment” Use Case relating to the ETA information will be exchanged with AEOLIX, a platform that already manages this service.

DBA Green+ is an IoT Platform that assesses the environmental impacts of the port’s anthropic activities. DBA Green+ is an environmental monitoring, prediction and decision support system that improves the ecological footprint of the port. The service foreseen by the “CO₂ & NO_x” Use Case, aimed at estimating the CO₂ emissions of trucks visiting the Port of Trieste’s facilities, will exchange information with HPCS Sinfomar to support the Port Authority’s environmental evaluation.

The technical description of the platforms to be federated will be carried out in D2.2.2.

3.8 Italy, Milan/Genoa: The Italian Rhine Alpine Pilot Site – Dynamic Synchronodal Logistic Modules

This Pilot is divided into two different but complementary types of transports, positioned in the same corridor. Its strength is the sound connection between the objectives and the needs that encourage the conception and the development of effective, efficient, secure and sustainable solutions by creating new ways of approaching the different obstacles.

The overall aim of this Pilot Site is to provide several tools to optimise the planning and the real-time operation of the maritime, aerial, logistics and transport operators of the Italian northwest regions. The aims are to achieve effective and sustainable use of the whole northwest infrastructure in the

three regions of Liguria, Piedmont and Lombardy. For the Liguria Region, in particular, the pilot needs to cope with the actual infrastructural deficit due to the collapse of the Morandi bridge.

The following table provides information on the existing platforms in the **Italian Pilot Site (2)** and covers the following Use Cases:

- UC1: Expected Time of arrival (ETA) App service development;
- UC2: CO₂ & NO_x emissions monitoring and reduction;
- UC3: Dangerous goods transportation monitoring;
- UC4: B2A /A2B services like Customs;
- UC5: Safety and eCustoms operations monitoring;
- UC6: Digital synchro modal information dashboard;
- UC7: Synchro modality;
- UC8: Real-time Road optimisation in ports;
- UC9: Real-time Rail optimisation in ports;
- UC10: FENIX scale-up and transferability plan.

3.8.1 Platform IT (2) 1: Port Authority of the Eastern Ligurian Sea Port Community System

| | |
|--|--|
| FENIX partners involved | Port Authority of the Eastern Ligurian systems |
| Offered services | <ul style="list-style-type: none"> - Services in relation to FENIX - Vessel Loading List - Vessel manifest and Customs data - Vessel unloading list - Port gate in (road and rail) - Port gate out (road and rail) |
| Developer's name | Engineering |
| Data format | EDIFAT / XML |
| Data exchange protocols | Web services |
| User costs | The Port Authority offers the system to its own community |
| Existing interconnections with other platforms (please | <ul style="list-style-type: none"> - Corridor Management Platform to monitor of the hinterland logistic |

| | |
|---------------------------------------|--|
| explain details) | <ul style="list-style-type: none"> - Customs Single Window - National Maritime Single Window |
| Platform benefits for an organisation | Single point of access for most of the cargo related services. |
| Accounting rules | User authentication (user account, login/logout) |
| Monitoring details | Log File to trace all the operations executed through the platform. |
| Use Case link | UC6 and UC9. |

Table 35: Genoa Italian platform 1

3.8.2 Platform IT (2) 2: Terminal Operating System

| | |
|--|---|
| FENIX partners involved | Ignazio Messina Terminal |
| Offered services | Gate in / Gate out / Yard Management / Vessels Management |
| Developer's name | Jade |
| Data format | EDIFACT XML |
| Data exchange protocols | Web services |
| User costs | Internal use |
| Existing interconnections with other platforms | Port Community System in Genoa |
| Platform benefits for an organisation | Use of the handling of container in terminals |
| Accounting rules | User authentication (user account, login/logout) |
| Monitoring details | Log File to trace all the operations executed through the platform. |
| Use Case link | UC7 (Genoa)- Synchro-modality |

Table 36: Genoa Italian platform 2

3.8.3 Platform IT (2) 3: MILOS-CMP, International Federative Module powered by MILOS

| | |
|---|---|
| FENIX partners involved | Circle |
| Offered services | <ul style="list-style-type: none"> - Near-to-realtime Track & Trace (including IoT info / status of e-Seals / vessel status) - Dematerialisation and digitalisation of accompanying documents, such as cargo manifest (eManifest), phyto-sanitary certificate, origin declaration certificate, etc. |
| Developer's name | Circle |
| Data format | SOAP and FTP |
| Data exchange protocols | <p>Push/Pull API approach:</p> <p>in pull mode, the data consumer calls the MILOS-CMP services according to exposed interface;</p> <p>in push mode, MILOS-CMP calls the consumer's API according to its interface.</p> |
| Usage costs | Different pricing depending on the application. |
| Existing interconnections with other platforms (please explain details) | <p>The module is powered by MILOS, a platform integrated with the Italian Customs Informative System AIDA for the exchange of particular messages, such as the list of MRN of an Arrival Manifest or the list of containers in an Arrival Manifest. The module is also able to connect with other platforms (such as PCS and TOS) through standard software connectors.</p> |
| Platform benefits for an organisation | <p>MILOS is a suite of software products that covers a broad range of applications in the logistics chain. Thanks to its flexibility, MILOS already has a wide customer base, which can be further expanded through the federative approach of FENIX.</p> |

| | |
|--------------------|--|
| Accounting rules | There is a unique user authentication and profiling (roles, authorisations, etc.). A trustworthy communication is secured via HTTPS. |
| Monitoring details | Event/error/activity logging through clear-text files. |
| Use Case link | UC6 and UC9. |

Table 37: Genoa Italian platform 3

3.8.4 Platform IT (2) 3: Mxp – Smart CargoCity

| | |
|-------------------------|--|
| FENIX partners involved | SEA |
| Offered services | <ul style="list-style-type: none"> - AWB / HAWB data entry and transmission from Freight Forwarders to Ground Handlers (AWB/ HAWB data, security checks data, Customs clearance - MRN, tracking of shipment status) - Cargo assembly and transport to the Ground Handler’s warehouse (part-shipments, ULD and loaded shipments, truck manifest) - Booking a slot for the unloading slot (truck load type, the truck unloading slot is assigned by the Ground Handler) - Time of entry and exit of trucks from Cargo City (done by reading the plates) - Tracking of goods (the service enables the tracking of the main states of processing of incoming and outgoing shipments) - Monitoring of the time spent by truck drivers in the different phases of their work in the Cargo City area. |
| Developer’s name | Piksel (first three services) SEA |
| Data format | XML / JSON |

| | |
|--|--|
| Data exchange protocols | SOAP / REST / sftp |
| User costs | Free of charge |
| Existing interconnections with other platforms | The services exposed by the <i>Mxp - Smart CargoCity Digital Ecosystem</i> require to interact (mainly via APIs) with the airport platforms and with the stakeholder's information systems that use the services, mainly Ground Handlers and Freight Forwarders. |
| Platform benefits for an organisation | The <i>Mxp - Smart CargoCity Digital Ecosystem</i> , created with the contribution of all the stakeholders of the import-export air freight chain, allows the different actors to use, integrate and share the information of their interest in the cycle of incoming and outgoing air cargo at Malpensa airport. SEA's role is crucial: by offering a better service to all the actors involved, SEA will consolidate and increase cargo traffic on its terminals. |
| Accounting rules | Since the information exchanged between actors through the <i>Mxp - Smart CargoCity Digital Ecosystem</i> can be very sensitive, participation to the Ecosystem requires the candidates to follow a well-defined process (which can be investigated here: http://ecosistemacargomalpensa.SEAmilano.eu/adesione.html). |
| Monitoring details | All the operations executed through the Digital Ecosystem can be verified through an API exposed by the Ecosystem itself. |
| Use Case link | UC1, UC2, UC3, UC4 and UC5. |

Table 38: Milan Italian platform 1

3.9 Dutch Pilot Site, Smart Multimodal Operations Platform (Smip)

“Smart door-to-door multimodal T&L services across TEN-T corridors” (SMIP) will introduce the digitalisation for the “door-to-door” multimodal transport operations of in Europe. The ambition is for forwarders to offer a more attractive and competitive transport service to shippers, thanks to which the long-haul transport will be provided via rail.

The following table provides information on the existing platforms in the **Dutch Pilot Site** and covers the following Use Cases:

- UC1: Paperless Transport in Road-Rail Combined Transport;
- UC2: Digital transformation of terminal gate-in/out processes;
- UC3: B2A data exchange in intermodal transport.

3.9.1 Platform NL 1: Xynaps e-Documents as a Service

| | |
|-------------------------|---|
| FENIX partners involved | PIONIRA NV |
| Offered services | <p>PIONIRA NV offers e-Documents as a Service for transport and logistics. PIONIRA 's services provide functionality to create and be notified about the life-cycle changes in the various documents that are legally needed during transport. This is not limited to the electronic consignment note (e-CMR).</p> <p>PIONIRA is also an accredited service provider for electronic documents needed for the transport of:</p> <ul style="list-style-type: none"> - Waste (dangerous, non-dangerous) - Contaminated or non-contaminated Soil - Packaging slips, POD. |
| Developer's name | PIONIRA NV |
| Data formats | Json/XML(PIONIRA e-Document format), csv, bespoke formats, SAP SHPMNT* and DESADV. |
| Data exchange protocols | <p>PIONIRA provides two kinds of APIs: REST and SOAP.</p> <p>To offer real time updates to stakeholders and connected systems, PIONIRA offers:</p> <ul style="list-style-type: none"> - Push notifications (web sockets); |

| | |
|--|---|
| | <ul style="list-style-type: none"> - Webhooks (Publish/Subscribe); - Status polling. <p>Identity Management Integration via:</p> <ul style="list-style-type: none"> - WS-Federation; - OpenID; - SAML-P. |
| User costs | A post-paid monthly plan, based on the number of issued documents per year. |
| Existing interconnections with other platforms | <p>A backend integration with TMS and ERP systems:</p> <ul style="list-style-type: none"> - TAS; - Navitrans; - SAP; - Eurotracs; - Navision; - Bespoke TMS and ERP systems. <p>Mobile integrations:</p> <ul style="list-style-type: none"> - Trimble; - Transics; - Eurotracs; - TomTom Telematics; - TomTom Bridge; - Astrata; - Flux (BeMobile); - Customer specific apps. <p>Identity Management:</p> <ul style="list-style-type: none"> - Office 365/Azure AD; - C-Point (Antwerp Port Community System); - NxtPort. - BruCargo (Air Cargo Brussels - Nallian) - Belgian e-ID |

| | |
|--|--|
| <p>Platform benefits for an organisation</p> | <ul style="list-style-type: none"> - To extend the usage and adoption of e-Documents and create a wider community for PIONIRA 's existing users, to extend their digital transport cross border. - To connect PIONIRA 's platform to other platforms and systems to offer more integration possibilities to its existing and future users. - To exchange transport documents using UN/CEFACT standards. |
| <p>Accounting rules</p> | <p>User authentication and authorisation according to the data in the scope of the transport.</p> <ul style="list-style-type: none"> - Specific access rules per user depending on his/her entitlement in the digital document (consigner, consignee, waste treatment operator, carrier, subcontractor, successive carrier, government official, etc.) - Specific access rules and possible consent of the data owner, if the user requesting access is a government official that needs the data for auditing purposes (Police, Customs, etc.). |
| <p>Monitoring details</p> | <ul style="list-style-type: none"> - User access auditing and Government access auditing. - Complete versioning of the legal documents and archiving according to country and local governance models (e.g. 7 years for e-CMR). |
| <p>Use-case</p> | <p>UC1 and UC3.</p> |

Table 39: Dutch platform 1

3.9.2 Platform NL 2: TX Core

| | |
|--|--|
| FENIX partners involved | TX |
| Offered services | Order and booking management for intermodal loading units. |
| Developer's name | Yellowstar |
| Data format | Oracle and relational database structure |
| Data exchange protocols | <ul style="list-style-type: none"> - HTTPS - Restful Services - FTP |
| User costs | TBD |
| Existing interconnections with other platforms | <ul style="list-style-type: none"> - Third party railway operator: transport instructions for the rail carriage, feedback on updates such as accepted, rejected, loaded, gate-in / out etc. - Catkin communication platform: orders/instructions for first/last mile trucking, status feedback from truckers. - Softrail: real-time train status information. |
| Platform benefits for an organisation | <p>The platform is integrated with the business units of TX. This brings benefits such as:</p> <ul style="list-style-type: none"> - An optimised way of working; - Easier reporting / monitoring; - Everything is web-based, so there is no limitation on connectivity; - No more maintenance of different modules for each unit. |
| Accounting rules | Individual and role based access. |
| Monitoring details | LogFiles, Alerts and Status Messages. |
| Use-case | UC 1 |

Table 40: Dutch platform 2

3.9.3 Platform NL 3: TX Connect

| | |
|--|---|
| FENIX partners involved | TX |
| Offered services | An enterprise Service Bus and a communication system between mutually interacting software applications (internal/external). |
| Developer's name | Talend |
| Data format | A file based supported with Oracle Database in the background for logging / setting etc. |
| Data exchange protocols | <ul style="list-style-type: none"> - SOAP - Restful - FTP - File Exchange |
| User costs | N/A |
| Existing interconnections with other platforms | <ul style="list-style-type: none"> - TX Core - Softrail - Various TOS |
| Platform benefits for an organisation | <ul style="list-style-type: none"> - Central control tower for all communications - Being able to support any communication type / format - Not depending on one supplier - Faster integration (development as well as processing). |
| Accounting rules | TBD |
| Monitoring details | Performance Monitoring and Status Alerts. |
| Relevant Use Cases | UC 1 |

Table 41: Dutch platform 3

3.9.4 Platform NL 4: Softrail Suite

| | |
|--|---|
| FENIX partners involved | TX |
| Offered services | <ul style="list-style-type: none"> - Railway Operating Management System, including skill planning (e.g. for wagon inspector, train driver) - Maintrack (managing and tracking of rolling stock) - Verform (forms verification for wagon composition, wagon lists and Hermes H30 format) - Logishift (overall planning and tracking of trains, long-term and daily operations) - All modules are web-based and mobile - A dedicated Rail Mobile module (App) to communicate with train drivers. |
| Developer's name | Binary |
| Data format | TBD |
| Data exchange protocols | XML |
| User costs | N/A |
| Existing interconnections with other platforms | Various IM data e.g. RFI status data and DB Netz (Leidis). |
| Platform benefits for an organisation | <ul style="list-style-type: none"> - An integrated planning and management of trains, including resources and assets - An ensured compliance with regulations |
| Accounting rules | Individual and role-based access. |
| Monitoring details | Performance monitoring (New Relic) |
| Relevant Use Cases | UC1 |

Table 42: Dutch platform 4

3.9.5 Platform NL 5: ILU CODE Application

| | |
|--|--|
| FENIX partners involved | UIRR |
| Offered services | A European harmonised system to identify all intermodal loading units (ILUs), such as swap bodies and semi-trailers. |
| Developer's name | Tostaky |
| Data format | XML |
| Data exchange protocols | |
| User costs | Free |
| Existing interconnections with other platforms | Various Combined Transport Operators and Terminal Operators. |
| Platform benefits for an organisation | Use the compliance tool according to EN 13044-1 (UIRR as officially administrator of the so-called ILU-Code) |
| Accounting rules | The platform uses: <ul style="list-style-type: none"> - Publicly available register - registered users for reservation |
| Monitoring details | The daily monitoring through a backend solution (new registrations, renewals, cancellations) is carried out. |
| Relevant Use Cases | UC 3 |

Table 43: Dutch platform 5

3.9.6 Platform NL 6: Terminal Operating System Bologna

| | |
|-------------------------|---|
| FENIX partners involved | Interporto Bologna |
| Offered services | <ul style="list-style-type: none"> - Shunting Operation Management, exchange of information with railway undertakings - Track & Trace - Handling booking system - Terminal Management |

| | |
|--|--|
| | - System for Unit Maintenance |
| Developer's name | SAP |
| Data format | Xml |
| Data exchange protocols | File based FTP, Codeco and File Exchange. |
| User costs | Free for the terminal managers |
| Existing interconnections with other platforms | <ul style="list-style-type: none"> - Connections with the other platforms (SAP based) belonging to FS group. - Connections with MTOs for the booking services. |
| Platform benefits for an organisation | Management of the terminal activities. (Additional features should be developed and implemented for an automatic and complete control and management of the activities.) |
| Accounting rules | Individual and role-based access. |
| Monitoring details | Registration of the cargo movements in and out of the terminal. |
| Relevant Use Cases | UC2 |

Table 44: Dutch platform 6

3.9.7 Platform NL 7: JdR Jplex (multi-node)

Jplex – Jan de Rijk Planning, EXecution and Scheduling system

| | |
|-------------------------|---|
| FENIX partners involved | JdR |
| Offered services | <ul style="list-style-type: none"> - Planning & Execution of transport services - Truck & Rail-based transport - Track & Trace - Alerting - Reporting on the status of freight - eCMR (experimental) - Control centre operations |
| Developer's name | JdR / Ordina (software development) / Quintiq |

| | |
|---|---|
| Data format | A relational database structure |
| Data exchange protocols | <ul style="list-style-type: none"> - Message Integrator (XML based) - Collaborative Schedule Integrator (object based) |
| User costs | TBD |
| Existing interconnections with other platforms (please explain details) | <ul style="list-style-type: none"> - TSP portal (charter portal) - TSP connector (direct connections road hauliers) - Rail connector (TX interface) - FSR (freight status report) connector; multiple shippers - TSE (truck status execution) connector - ETA connector (PTV x-server) |
| Platform benefits for an organisation | <p>Having an integrated platform used by all the business units of JdR for the planning and the execution of transport services. This system is multi node based and interconnected.</p> <p>Typical benefits for this APS (advanced planning system) are:</p> <ul style="list-style-type: none"> - A freight status visibility dashboard; - A truck & Rail status visibility dashboard; - A truck (asset planning & execution); - Automated Freight Status Reporting; - Automated activity and freight based alerting; - Control centre operations based on (truck) carrier select optimiser. |
| Accounting rules | Individual and role based access. |
| Monitoring details | LogFiles, Alerts and Status Messages. |
| Relevant Use Cases | UC1 and UC3. |

Table 45: Dutch platform 7

3.9.8 Platform NL 8: JdR TSPportal (road-haulier based)

TSPportal – Transport Service Provider web based portal

| | |
|--|---|
| FENIX partners involved | JdR |
| Offered services | <ul style="list-style-type: none"> - Freight orders - Execution reporting and tracking - Transport documents - Self-billing |
| Developer’s name | JdR / ACB (software development Frankfurt) |
| Data format | Relational database structure |
| Data exchange protocols | Message Integrator (XML based) |
| User costs | TBD |
| Existing interconnections with other platforms | Jplexs (JdR planning system) |
| Platform benefits for an organisation | <p>Having an integrated platform that is used by a selection of preferred carriers (road hauliers).</p> <p>Typical benefits for this TSP portal are:</p> <ul style="list-style-type: none"> - Freight transport requests; - A freight status visibility dashboard; - Transport documents; - A truck (asset planning & execution). |
| Accounting rules | Individual and role-based access. |
| Monitoring details | LogFiles, Alerts and Status Messages. |
| Relevant Use Cases | UC1 |

Table 46: Dutch platform 8

3.9.9 Platform NL 9: JdR Connect (ESB)

| | |
|-------------------------|--|
| FENIX partners involved | JDR |
| Offered services | An enterprise Service Bus and a communication system between mutually interacting software |

| | |
|--|--|
| | applications (internal/external). |
| Developer's name | MuleSoft / JdR |
| Data format | A file based supported with Oracle Database in the background for logging / setting etc. |
| Data exchange protocols | <ul style="list-style-type: none"> - SOAP - Restful - (s)FTP - File Exchange |
| User costs | N/A |
| Existing interconnections with other platforms | <ul style="list-style-type: none"> - Jplexs (JDR) - TSPportal - Various TSP (road hauliers) - Various LSC (shippers) |
| Platform benefits for an organisation | <ul style="list-style-type: none"> - A central control tower for all communications - Being able to support any communication type / format - A faster integration (development as well as processing). |
| Accounting rules | TBD |
| Monitoring details | Performance Monitoring and Status Alerts. |
| Relevant Use Cases | UC1 and UC3. |

Table 47: Dutch platform 9

These listed platforms are present in the Pilot Sites but not all of them will be federated in FENIX. The platforms to be federated and the related requirements are specified in D2.2.2 by the Dutch Pilot Site and other Pilot Sites. D2.2.2 can be seen as a reference list.

The "Transport Operations platform" is a new platform to be built for the common "digitalised common supply chain process". The technical design for the "Transport Operations platform" is not yet made. The technical specifications from Activity 3 for the "FENIX connector" will be one of the inputs for the technical design.

For the fulfilment of multimodal transport services in the Dutch Pilot Site, a full supply chain needs to be organised. The individual parties need to exchange data to collaborate in the supply chain. The

roles of these parties are Freight Forwarder, Road carrier, Rail carrier, Maritime carrier and Terminal operators (ports, inland hubs). The individual parties use their own existing platforms, which will get interconnections with the “Transport Operations platform” to exchange data in the supply chain.

3.10 Slovakia, all TEN-T Corridors and Multimodal Pilot Site

The Slovakia Pilot (Mondelez) aims to deliver much better integration / interoperability with the large numbers of partners and service providers involved on the Transport & Logistics networks that support the movement of goods for Mondelez all over Europe (and beyond). Mondelez also aims to integrate their ERP, TMS, Track & Trace and Customs Management solutions to achieve a smoother flow of goods throughout the networks also cross-border.

The table below provides more information about the existing platforms in the **Slovak Pilot Site** and covers the following Use Cases:

- UC1: Supplier’s shipments to the manufacturing plants;
- UC2: Warehouse to Customer ERP “WHS” -> TMS -> ERP “customer”;
- UC3: Direct Plant shipments to Customer -> ERP “MDLZ” -> TMS -> ERP “customer”;
- UC4: Track & trace vehicle/shipment, Multimodal transport.

3.10.1 Platform SK 1: ERP

| | |
|-------------------------|---|
| FENIX partners involved | MDLZ affiliated entities. |
| Offered services | <ul style="list-style-type: none"> - The production of finished goods - Raw, Pack & Material supply to the manufacture - A country distribution centre for finished goods to customers |
| Developer’s name | <ul style="list-style-type: none"> - Identity Manager: SAP - Connectivity Engine: PI/PO – B2B Hub - Intelligent Dashboard: SAP BI - Data Transformation Service (DTS): Accenture - Infosys - Software Development Kit (SDK) and API - Toolkits: SAP modules |
| Data format | Idoc |

| | |
|--|--|
| Data exchange protocols | AS2 |
| User costs | Not yet defined |
| Existing interconnections with other platforms | PI/PO - XML |
| Platform benefits for an organisation | To have a detailed data exchange to TMS and extension of module ability ERP/TMS. |
| Accounting rules | SAP lead system |
| Monitoring details | |
| Use Case link | All Use Cases |

Table 48: Slovak platform 1

3.10.2 Platform SK 2: TMS

| | |
|--|--|
| FENIX partners involved | MDLZ affiliated entities and TX Logistik. |
| Offered services | <ul style="list-style-type: none"> - Inbound and outbound transport planning and execution - Rail terminal time slot bookings and schedules - Customs clearance procedures |
| Developer's name | <ul style="list-style-type: none"> - Identity Manager: Oracle - Connectivity Engine: B2B "Infosys" - Intelligent Dashboard: FTI "OTM" - Data Transformation Service (DTS): B2B - Software Development Kit (SDK) and API: - Toolkits: OTM modules |
| Data format | EDI fact / XML |
| Data exchange protocols | AS2 |
| User costs | Not yet defined |
| Existing interconnections with other platforms | <ul style="list-style-type: none"> - B2B Hub: connection to carrier platforms, warehouse platforms by EDI fact, FTP and SFTP. |
| Platform benefits for an | Shared maintenance and cost reduction. |

| | |
|--------------------|--|
| organisation | |
| Accounting rules | Inbound process is managed by Load Control Center (LCC), Outbound process is managed County accountability |
| Monitoring details | Track & Trace of operations through one system approach for a centralised and decentralised use by means of online reporting tools and a reporting database. |
| Use Case link | All Use Cases |

Table 49: Slovak platform 2

The **Slovak Pilot Site** will federate only one platform, originally the ERP (Enterprise Resource Planning) and the TMS (Transport Management System) via the OTM cloud solution, detailed in D2.2.2.

3.11 Spain, the Spanish-Atlantic Corridor Pilot

Within FENIX, the Spanish consortium focuses on increasing the data visibility between the main nodes and the actors involved in the Atlantic corridor (the activities and operations of the Port of Bilbao are taken as main node). A second focus is on enabling data sharing and visibility with other nodes in the corridor, especially in Portugal, France and Germany, and connecting with other TEN-T corridors and port nodes, such as North-SEA Mediterranean and Rhine-Alpine corridor.

The following table provides information on the existing platforms in the **Spanish Pilot Site** and covers the following Use Cases:

- UC1: Rail Planning;
- UC2: B2A & A2B services with Customs;
- UC3: Dangerous Goods Authorisation;
- UC4: Booking of slots for operations in Dry Port;
- UC5: Loading & Discharge Lists Management;
- UC6: End-to-End Track & Trace;
- UC7: Business Intelligence applied to intermodal operations.

3.11.1 Platform SP 1: ePuertoBilbao

| | |
|--|---|
| FENIX partners involved | Port of Bilbao |
| Offered services | <ul style="list-style-type: none"> - Vessel calls - Summary Declaration and Manifests management - Management of Dangerous Goods - Coordination of container positioning at the Border Inspection Post - Pre-entry notification - Export cargo list - Delivery & Acceptance - Entry / Exit Summary Declaration Management - Manifest from the export cargo list - Verified Gross Mass communication - Shipping instructions and booking service. |
| Developer's name | Port of Bilbao |
| Data format | EDIFACT |
| Data exchange protocols | Web services and ftp. |
| User costs | Not yet defined |
| Existing interconnections with other platforms | Maritime Nacional Single Window – DUEPORT via ftp to exchange information about vessel calls. |
| Platform benefits for an organisation | The use of an electronic platform under the "One Stop Shop" concept allows the normalisation, simplification and harmonisation of procedures related to maritime transport. The integration of all organisms and agents of the port community is included. This is a mechanism to exchange electronic documents (paperless), generate authorisation and provide traceability of operations. |
| Accounting rules | Based on user authentication. |

| | |
|--------------------|---|
| Monitoring details | A Log File to trace all the operations executed through the platform. |
| Use Case link | UC1, UC2, UC3, UC4, UC5 and UC6. |

Table 50: Spanish platform 1

In the Spanish Pilot Site, the only existing platform is ePuertoBilbao, a PCS platform for the provision of electronic commerce services within the Port of Bilbao's community. Currently, any communication with the dry port is done either via e-mail or by phone. However, to demonstrate the feasibility and advantages of the FENIX federation, two new platforms will be included in the pilot. These additional platforms will be described in D2.2.2.

CONCLUSIONS

The deliverable provides a broad overview of existing platforms in Europe. Each Pilot Site provided descriptions of its platforms through the definition of some themes, such as existing connections, accounting rules and the communication language used.

Based on the analysis conducted for each Pilot Site in the previous chapter, FENIX Pilot Sites have declared a significant number of used platforms, some of which are common among the pilots. For example, "TXconnect" and "TXcore" are used by the German and Dutch pilot.

It is important to note that connections already exist between different pilots: The French C-ITS platform is linked to the AEOLIX and SELIS platform to receive information from terminal operators and carriers. Another example is PIONIRA's the Dutch platform "Xynaps e-Documents as a Service", which has interconnections with the Belgium AirCargo platform. The examined PS platforms describe a series of most frequently offered services, such as Track & Trace, monitoring and booking and the ETA service. Moreover, some platforms such as Sinfomar and AEOLIX have similar interoperability and connections characteristics.

Starting from this overview, each pilot will begin to determine the platforms to be federated and in deliverable D2.2.2., in which these platforms will be better detailed from a technical point of view. Not all existing platforms or services will be federated, because some pilots have chosen to build a new platform to connect to FENIX. The reasons for these choices will be better explained in D2.2.2, where the technical details will be described by each Pilot Site.

Nevertheless, it is important to underline a new result: this survey activity provided the opportunity for some Pilot Sites to implement new platforms or rationalise the existing ones. In fact, each Pilot Site designing new platforms to be federated, which collect existing several services, will simplify the system in terms of number of operations. This need emerged during the project and the Pilot Sites discussions, representing now a great opportunity for FENIX to improve the existing ecosystem.

A general remark is that the Pilot Sites exhibit similar Use Cases showing the opportunity for federating platforms in a common ecosystem. The key issue is "What data does a party need and what data can a party provide" on the semantic level. D2.2.1 presented the current IT systems and data exchange platforms of all the Pilot Sites. This description will be the basis to assess how each local legacy system/platform could be orchestrated within the FENIX federated network of platforms.

From the first reading of the descriptive tables, the following expected features can be inferred:

- The FENIX federation must support multiple and heterogeneous data sources;

- The FENIX federation should enable communication among many different services;
- Data privacy and user pseudonymisation must be respected;
- To share data between different platforms across the FENIX federation, the parties should agree on the data owner's usage policy.

To develop a European federated architecture for data sharing serving the European logistics community of shippers, logistics service providers, mobility infrastructure providers, cities, and authorities, the FENIX federation fulfils the general aspects of connectivity, interoperability, security and trust.

FENIX will develop the federative architecture to offer interoperability between any potential existing and future platform, which is implemented by means of common protocols for supporting data sharing services across this future federative pan-European architecture.

FENIX will also need a governance model that can be modelled on the basis of PS requirements, in order to create a flexible and sustainable ecosystem.

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