NEWSLETTER #7

October 2022

PROGRESS TOWARDS FEDERATED LOGISTICS THROUGH THE INTEGRATION OF TEN-T INTO A GLOBAL TRADE NETWORK

COORDINATION

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COMMUNICATION

FUNDACIÓN VALENCIAPORT

Contents

This project is funded from the European Union´s Horizon 2020 research and innovation programme under grant agreement No 860274

Living Lab 2: major breakthroughs

Living lab 2 at a glance

Synchromodal dynamic management of TEN-T & intercontinental flows promoting rail transport

PLANET LL2 is working on dynamic and synchro modal management (achieving synergies between) of TEN-T & intercontinental rail freight flows, utilising the Port of Rotterdam (PoR) as the principal smart EGTN node centring rail focused transport chains. This will focus on intercontinental rail freight between China and the EU, but also on linking China and Russia through Rotterdam to/from USA and the UK (shortsea and ocean freight).

Use Cases

UC 1 on improving information flow through Blockchain enabled platform

Use Case 1 focuses on Synchromodality in a Blockchain-enabled Platform involving the PoR community and customers to create the best multi-modal alternatives for logistics solutions within the LL2 corridors. The functional specifications of this demonstrator will also be used as an initial step for UC 2 case 2 and will be further extended to support shipping documentation (the electronic Bill-of-Lading).

Development of an innovative multimodal blockchain-based supply chain execution system, providing a single platform for the digitisation and automation of the information flow related to multimodal, multi-stakeholder, cross-border shipments.

Main Activity
BLOCKCHAIN PLATFORM

UC 2 on investigating the potential Eurasian rail freight expansion through streamlining information flows

Use Case 2 addresses improvements in intermodal rail freight handling between China and Europe and potentially USA. The use in a pre-test environment of Blockchain technology for rail freight transport between the two continents will be a key point in this use case.

Investigate Eurasian rail freight expansion through the implementation of (1) a collaborative platform with the key railway stakeholders and (2) a new digital data sharing proof-of-concept for rail freight transport, using Blockchain as preferred technology

Main Digital Activity
DEFINE OPTIMAL DIGITAL SOLUTIONS FOR DOCUMENT EXCHANGE

UC 3 on analysing the implications for European corridor planning of the expansion of new trade routes

Use Case 3 focuses on analysing the consequences of the UC 2 results for the local/regional agents of the EGTN Rhine-Alpes area since increased growth in trade and investments in Eurasian rail infrastructure are expected to impact the Eurasian rail freight flows in the future.

Dynamic simulation for the 2030- and 2050-time horizons of the impact of the Belt and Road Initiative (BRI) on the R-ALP Corridor.

Main Activity
DYNAMIC SCENARIO, 2030 AND 2050 TIME HORIZONS

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USE CASE 1

As a first and fundamental step in achieving synchromodality, we developed a blockchain based digital infrastructure that enables the logistic information flow between international stakeholders and logistic hubs. The infrastructure consists of a **document digitalisation, collection and distribution platform for the Port of Rotterdam (PoR) logistics community**, and the necessary **integrations with the Port of Valencia logistics community platform and** the **Green EU-Global Transport & Logistics Network (EGTN) EU-level logistics platform**. As part of UC1 this digital infrastructure was piloted by a Dutch fresh produce exporter and a Cargo Community System in the UK. This pilot showed potential savings in customs clearance costs up to 30% compared to conventional solutions thanks to highly automated workflow (for more information see also https://www.youtube.com/watch?v=sYRzflNvT6o). A patent application on the platform was submitted and is now pending.

Next, advanced planning algorithm, such as the one developed in UC1 can optimize the shipment allocation over the outbound modalities for a particular time period, whereafter the required shipment documentation needs to be exchanged with the right stakeholders in order to continue and complete the shipment. Crucial to the planning algorithm is accurate chronological logistic event ordering and traceability, as provided by the platform. For a logistic event occurring in one regional logistics platform, a non-sensitive summary is logged on the blockchain network used by the respective platform. Via a bridging solution that is part of the EGTN, this event is transferred to all other connected blockchain networks, where it can be picked up by other logistics platforms.

On top of that, the developed integration with the EGTN platform provides additional value to the PoR platform users via the offering of EU-level logistics information and shipment routing proposal services.

UC1 also developed state-of-the-art methods to guide freight transportation toward Physical Internet (PI). As an important step, an **algorithm has been developed that guides cargo dynamically through a network while experiencing travel time uncertainties**. The logic behind the algorithm uses capacity reservation as a hedging tool and the associated costs serve as a pricing mechanism for reliability. This algorithm is now available as documented open-source code.

In addition, UC1 developed a method to assess the benefits of smart contracts deployed in the importation and Synchromodal booking processes of cargo units. Smart contracts trigger the automated execution of agreements, which result in time savings on the critical path of the business processes at hand. The method assesses the overall time savings using Monte Carlo simulation.

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USE CASE 2

Given the continuing global and regional economic development, cargo traffic flows between Asia and Europe have steadily increased in the last two decades and are expected to rise still further. Eurasian rail cargo transport has grown significantly in recent years, but its share remains limited (see Figure 1). The number of operated trains rocketed from ~300 in 2014 to nearly 1,800 in 2016, while the transport volume grew from 25,000 TEU to 145,000 TEU. Despite this strong development, rail transport still has a low intermodal market share of ~1% in the trade between Asia and Europe. The majority of freight is transported by ship (more than 90%). In 2020, the market share reaches 5% of the total UIRR volume with a total traffic of more than 280,000 TEU.

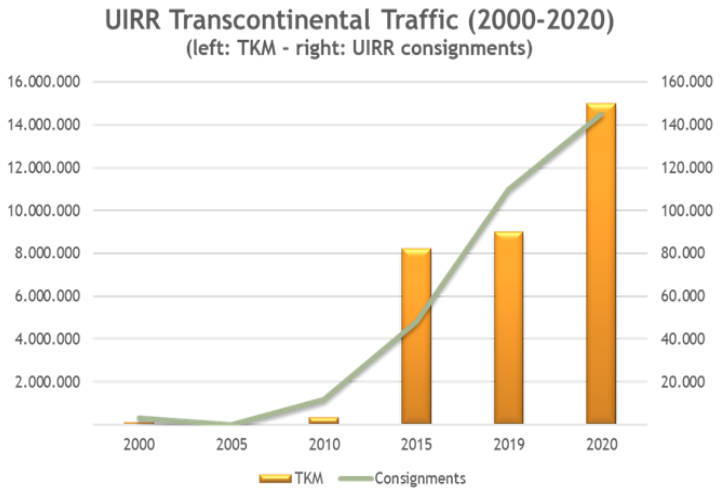

Figure 1. UIRR transcontinental traffic 2000-2020

Set-up of a collaborative intercontinental platform with key intermodal stakeholders

Under the coordination of UIRR and with the support of its subcontractor Consilis, the UC1 has been the initiator of setting up the Intercontinental Collaborative Platform (ICP). This ICP has to focus its work on the development and the implementation of legislative or policy initiatives (at national & European levels) and the initiation of international multilateral improvements. The effort is accompanied by the development, the revision and the implementation of international, European and national standards and industry best practices with a focus on Road and Rail with the aim to increase interoperability.

The activities have been divided into two main streams both on a long and short-term perspective (see Figure 2): a horizontal approach with the formulation of a sector-wide position (formulation of common rules) and a vertical viewpoint on the supply network with actual operational issues (such unnecessary process hurdles). Several workshops are organised to detail both approaches. A plenary session will all interested parties will be organised during the EU Silk Road Summit in December (Duisburg).

	Business Ecoystem (horizontal) Associations	Business Ecosystem (vertical) Supply networks
Long > 2 years	1. EU position "terms of reference" (formulate common rules and one EU voice to CN) 2. Alternative routes & hurdles on Middle Corridor	1. Improve service quality & transparency
Short ≤ 2 years	1. Harmonize documents across supply chain 2. Harmonized custom agreements 3. Enforce compliance to agreed standards (e.g. container types)	1. Unnecessary process hurdles (e.g. pictures of containers/wagons) 2. Payload topic and other harmonization topics (CN railways)

Figure 2. Potential areas of collaboration

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Digital platform for improved document exchanges

UC2 has pre-selected four possible routes that were narrowed down to one as practical demonstrator for the planned innovation. This scoping was in parallel complemented by the analysis and prioritization of the key hurdles that prevent the Eurasian Railway growth in order to support the integrated EGTN.

The Project partner UIRR together with HUPAC and VTG have defined which of the identified problem areas can be addressed most sufficiently and adopted so the benefits are shared for the whole CT business ecosystem from Europe to China on the selected routes. The measures are targeted to achieve (intermodal) rail traffic growth, TEN-T utilization and support of EGTN. The chosen demonstrator, developed with the support of BlockLab, has focused on the digital facilitation of the document exchange service (DXS) between the different stakeholders. The approach was chosen to allow a low entry barrier in a year 2022 that is politically difficult for closer collaboration between EU – Russia and China. This external factor leads to a re-assessment and consequentially a lowering of the adoption rate on the Russian and China stakeholder side.

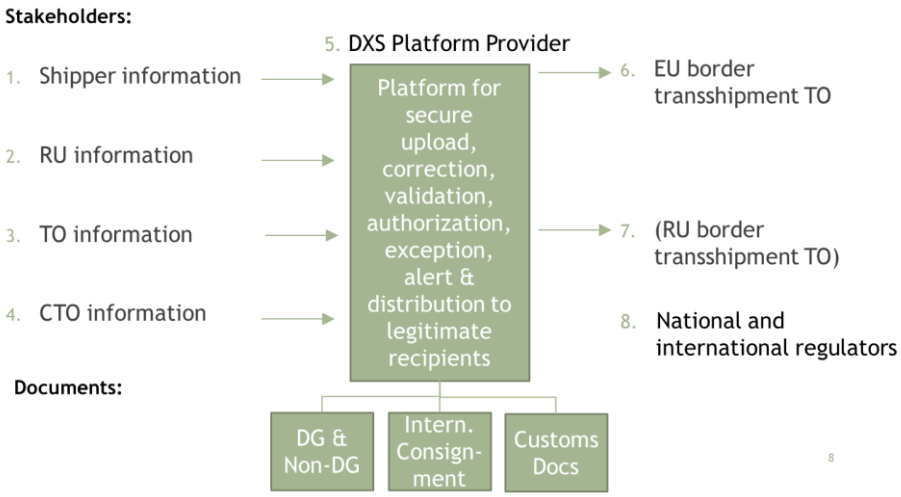

Figure 3. Functional overview of the DXS platform

The demo case involves all main roles and functions within an intermodal chemical supply chain: the chemical shipper prepares all necessary documents (packing list, MRN, MSDS, certificates) and the LSP must provide all requested information regarding the technical description of goods and the inspection reports in case of tank containers; all these documents are then handed over to the Combined Transport Operator that will issue the consignment note(s) (CIM, SGMS). The PLANET's DXS platform will facilitate the handling of digital documentation among all actors including the authorities such as the customs at both sides (Europe and China). This platform and its overall approach have been validated by the collaborative platform (see previous point).

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USE CASE 3

Strategic corridor planning on the RALP

UC3 assess the implications for the ports of Rotterdam, Hamburg, Duisburg, Tilburg and (other) TEN-T infrastructure, and this will be directed at strategic corridor planning for accommodating the increasing flow of freight traffic from China.

For these purposes, a dynamic simulation for the baseline year (2019) of the impact of the Belt and Road Initiative (BRI) on the RALP corridor has been carried out. The simulation takes into account both Eurasian rail freight transport entering the RALP region and the potential shift of freight flows from Northwest European seaports to Mediterranean seaports stemming from BRI and TEN-T investments. Eurasian rail freight is typically processed through Duisburg, Tilburg and a small number of alternative centres. In addition, although not part of the RALP corridor, the port of Hamburg handles considerable volumes as well (see Figure 4).

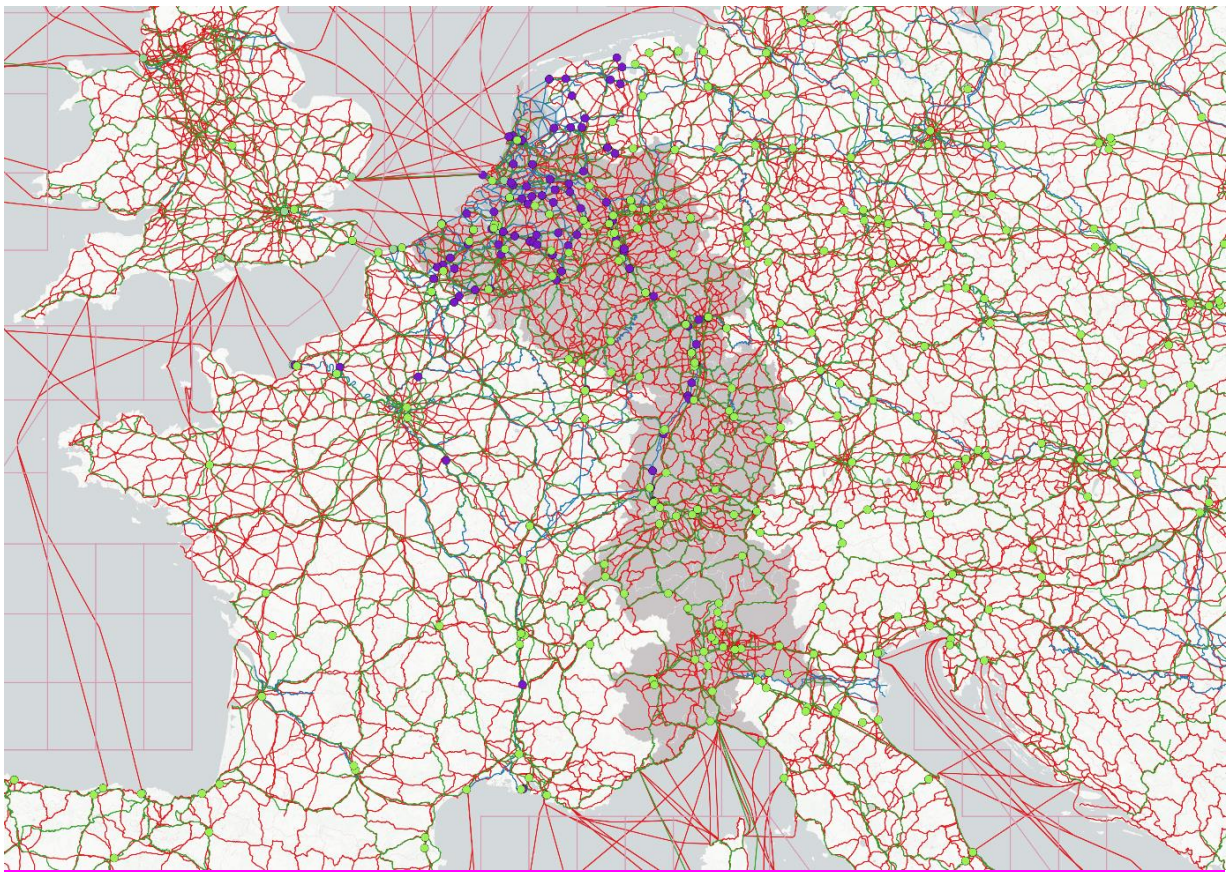

Figure 4. Snapshot of the network and transhipment points used in the UC3 modelling exercise

In recent weeks, simulations of container transport flows from China have been run. The Figure 5 shows the expected transport flows of containers on the RALP corridor. The largest flows come to the RALP region from the seaports of Rotterdam, Antwerp and Genoa. The simulations show that in 2030, some 350,000 TEU are also expected to come to the RALP region from China via the rail terminals of Ghent, Liège, Tilburg, Duisburg and Milan.

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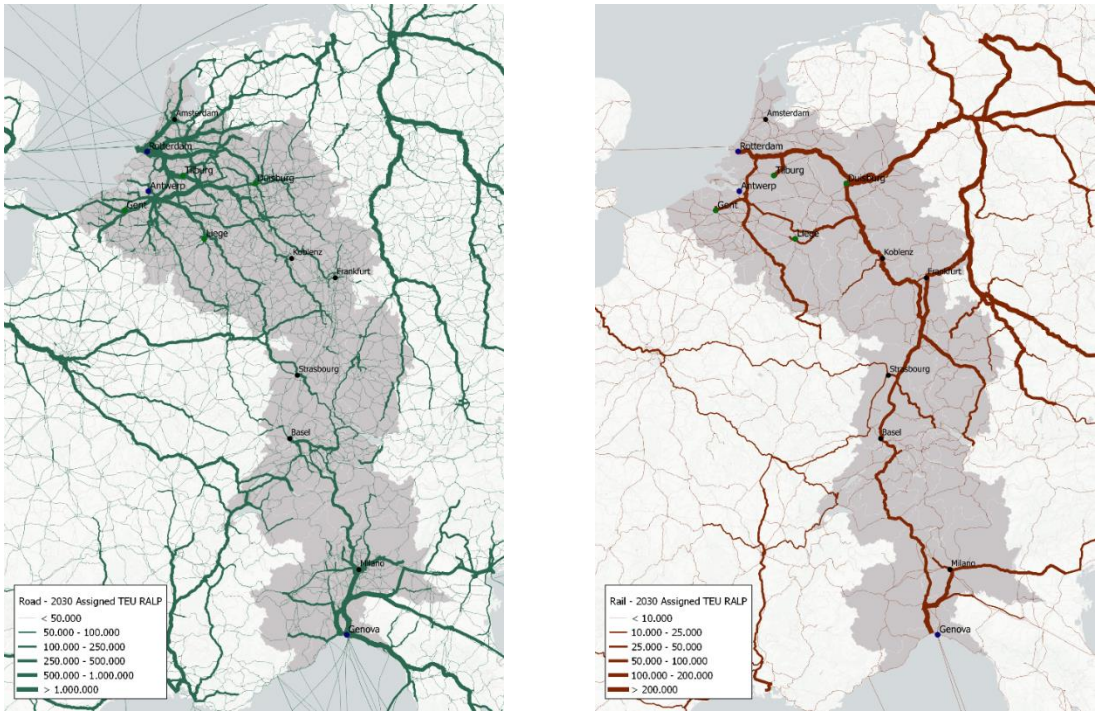

Figure 5. Modelled transport flows on the RALP road and rail network in 2030 - imported containers from China

Now that the simulations have been run, the analysis of the results begins. Part of the analysis is a scenario analysis looking at two scenarios: a scenario with strong growth in rail transport and a scenario on the dynamics of competition between North Sea and Mediterranean ports. The model will support the evaluation of new trade routes in the RALP region and decision-making on how to best maximise the EU's economic prospects through strategic planning.

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Attended events

SEPTEMBER 27, 2022 – Porto Maritime Week 2022

The 3rd edition of Porto Maritime Week gathered more than half a hundred speakers, addressing the state of the art of the sector, the main challenges and opportunities that the difficulties of the moment also end. PLANET was presented by Jorge d'Almeida (CPSI) during the conference panel on the 26th, session that congregated presidents of the nine Portuguese Port Communities who will address the future of their respective ports.

You can find more information here!

OCTOBER 6, 2022 – DAY 1 BUSINESS LOGISTICS IN MODERN MANAGEMENT

The 22nd International Scientific Conference Business Logistics in Modern Management 2022 comprised presentations and round-table discussions, bringing together scientists and experts engaged in problems of business logistics and supply chain management of goods and services with the purpose of exchange of scientific ideas and professional opinion.

PLANET took part at the *Session 2 - Sustainability and regional supply chains – Supply chain and logistics digitalization* on 6th October 2022. During this session Adam Kolinski and Marta Cudzilo (ILIM-PIT) presented the paper *Digitalization model of information and documents flows in goods movement processes in supply chains – determinants of implementation and measurement efficiency*, addressing a large part of the research results of the work carried out within Living Lab 3.

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News: PLANET's 4th General Assembly and new publications

OCTOBER 4-5, 2022 – PLANET 4th GENERAL ASSEMBLY MEETING

PLANET 4th General Assembly meeting took place on the 04th and 05th of October 2022, following a hybrid format. This meeting, hosted by Lukasiewicz Research Network – Poznań Institute of Technology, was divided in two days and was attended by over 45 participants.

You can find more information here!

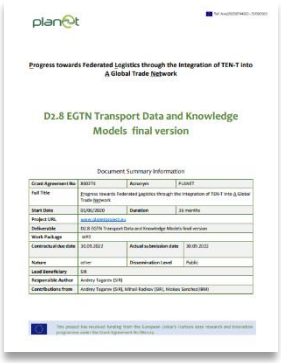
PLANET AT EU RESEARCH MAGAZINE

EU Research is a dissemination journal focusing on pioneering frontier research. The aim of the journal is to promote research projects to a relevant audience in government, the private sector as well as academia. It is read by the key people in national and European governments that control policy and research funding, leading scientific research institutes and major companies across numerous Industries in the private sector.

During July an article was published for the EU Research Magazine in the framework of the topic Physical Internet (PI) and the PLANET Project. The magazine interviewed the PLANET partner Kostas Zavitsas about the work of the PLANET project in helping transport and logistics companies work in a smarter and greener way.

You can read the full article here!

PLANET DELIVERABLE 2.8 EGTN TRANSPORT DATA AND KNOWLEDGE MODELS FINAL VERSION NOW AVAILABLE!



The main subject of this deliverable is to present the final form of the unified model behind the EGTN Connectivity Infrastructure. It follows on directly from D2.7 EGTN Transport Data and Knowledge v1 which presented the initial version of the model and the dataset selection process.

You can read the deliverable here!

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New OPERA

GS1 China

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UIRR International Union for Road-Rail Combined Transport

NGS srl New Generation Sensors

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Panteia Research to Progress

VLTN

Poczta Polska

RSM Erasmus

CERTH Centre for Research & Technology Hellas

Wuppertal Institut

ZLC MIT Global Scale Network

HARDT Hyperloop

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