



LL2 focuses 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 centering 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).

Specifically, this LL addresses improvements and growth in the transportation of rail freight between China-USA and the UK with the PoR as transshipment and modality shift point. Other close central transshipment nodes (e.g., Germany/Poland) located on a TEN-T or Rail Freight Corridors (RFCs) - in particular on the RFC8 – North Sea-Baltic corridor- will be also taken into account.

Objectives & Business benefits of the technologies implemented

Blockchain

The use of Blockchain solution will reduce inefficiencies in post-Brexit customs processes between the PoR and the UK (full custom declaration). Through automation of existing paper-to machine-to paper processes significant transport / operational / environmental cost reductions per shipment for customs are expected. The Blockchain-enabled platform will increase levels of security and the speed customs and commercial processes by improving the electronic management of documents (higher degree of digitalization and standardization), both at shipment and rail level.

Artificial Intelligence

The use of the Machine Learning (ML) will reduce manual entry time per shipment (up to 50%) through Optical Character Reading of documents.



Use case 1 Improving information flows through Blockchain enabled platform

Overview

The first use case will focus 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.

Great Britain has left the European Union per the 1st of January 2021. As a result, from 1July 2021, traders moving any goods will have to make full customs declarations at the point of importation and pay relevant tariffs, requiring full safety and security declarations.

A **Blockchain demonstrator** will be developed to **deal with post-Brexit customs processes between the Netherlands (PoR) and the UK for food related products**. The functional specifications of this demonstrator will also be used as an initial step for Use case 2 and will be further extended to support shipping documentation (the electronic Bill-of-Lading).

Overall activities and ‘AS IS’ - ‘TO BE’ comparison

	AS IS	TO BE
<p>MAIN ACTIVITY BLOCKCHAIN PLATFORM</p> <p>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. The shipping processes will be streamlined (process lead time and waiting times will be shortened) and compliance and labour cost, as well as disputes will be reduced.</p>	<ul style="list-style-type: none"> Sanitary and phytosanitary (SPS) checks for animals, plants and their products will take place at GB Border Control Posts (BCPs) and not at destination. Commodities subject to SPS controls will take have to be presented to Border Control Posts (BCPs) and more physical checks and taking of samples at BCPs will take place. Paper-based trade processes. Traders moving any goods not only have to pay relevant tariffs, but also have to make full customs declarations at the point of importation, increasing physical checks, additional paperwork and the risk of fraud. Due to the high costs and risks of customs clearing of goods in both The Netherlands and the UK, The Netherlands is gradually ceasing to act as a hub for EU and non-EU exporters of fresh produce. 	<ul style="list-style-type: none"> Automation of existing paper-to machine-to paper processes to reduce delays, handling costs and empty truck kilometres, as well as to increase secure digitalization of the information flow on shipment level. Speed-up customs processing post-Brexit for RoRo transport from the Netherlands to the UK points through a higher degree of digitalization. Improved tracking & tracing by providing accurate actual pick-up and delivery dates by using a digital consignment note (eCMR Transfollow). This will enable multi-stakeholder real-time tracking and viewing of end-to-end shipment related information. Savings per declaration stimulate cross-border synchromodal transport (e.g., export China via the “new Silk Road”) and the re-establishment of the Netherlands as (synchromodal) fresh produce hub.



Use case 2

Potential for Eurasian rail freight expansion through streamlining information flows

Overview

The second use case will address improvements in rail freight handling between China and Europe and potentially USA Specially. Use case 2 will focus on investigate **Eurasian rail freight expansion** through community platforms in order to deal with the numerous stakeholders of international rail freight and foster international rail transport from EU to China on the selected emergent routes.

The use in a **test environment of Blockchain** for rail freight transport between the two regions will be a key point in this use case. Therefore, depending on the identified key requirements and on the growth hurdles, the most appropriate organizational measures and (IT-) technologies will be chosen. The insights, experiences, and early demonstrators of innovative solutions such as **Physical Internet, Blockchain, smart contracts** will be given sound analysis if a use for rail freight transport between China and Europe is likely to be successfully adopted.

This use case will also utilize Use case 1 tools to investigate freight flow synergies and Blockchain innovation to support integration with European RFCs.

Overall activities and ‘AS IS’ - ‘TO BE’ comparison

	AS IS	TO BE
<p>MAIN ACTIVITY DEFINE OPTIMAL DIGITAL SOLUTIONS FOR DOCUMENT EXCHANGE</p> <p>Investigate Eurasian rail freight expansion through the implementation of new digital data sharing solutions for rail freight transport between China and Europe, using Blockchain as preferred technology for platform implementation.</p>	<ul style="list-style-type: none"> Eurasian rail cargo transport has grown significantly in recent years. Despite it is expected to rise still further, rail transport still has a low intermodal market share. The main barriers are: (1) disadvantages in border crossings, (2) reliability, (3) infrastructure and (4) other factors (subsidies reduction, legal restrictions for dangerous goods) while (5) falling sea freight rates aggravate the competition. 	<ul style="list-style-type: none"> A key challenge for further expansion of intercontinental rail freight transport concerns customs and phytosanitary document exchange along the corridors. Building on the Blockchain technology developed in Use Case 1, an intercontinental platform for document exchange will be developed. These documents to be exchanged are: <ol style="list-style-type: none"> Commercial documents: commercial invoice and signed consignment note (CIM & SMGS). Logistics documents: packing list. Customs documents: export declaration (MRN), certificate of origin, T1 (westbound) and pro-forma invoice. Dangerous Goods (DG): non-DG and DG declarations. HS category specific documents: plants protection (phytosanitary certificate), animals (veterinary certificate).



Use case 3

Implications for European corridor planning of the expansion of new trade routes

Overview

The third use case will focus on **analysing LL2 corridor flows and assessing the implications for PoR and other TEN-T infrastructure**. The use of the PLANET tools by PoR and “Interregional Alliance for the Rhine-Alpine Corridor EGTC” is directed at strategic corridor planning and it is used by EGTC members (focussing on the EGTC Rhine-Alpine area).

The main objective is to analyse the consequences of the results of the use of case 2 for the local/regional agents of the EGTCN Rhine-Alpes (R-ALP) area since increased growth in trade and investments in Eurasian rail infrastructure, including the popularity of new lines, such as the Kaliningrad route to Hamburg, are expected to impact the Eurasian rail freight flows in the future.

To this end, a **dynamic simulation** will be carried out for the 2030 and 2050 time horizons of the impact of the Belt and Road Initiative (BRI) on the R-ALP Corridor.

Overall activities and ‘AS IS’ - ‘TO BE’ comparison

	AS IS	TO BE
<p>MAIN ACTIVITY DYNAMIC SCENARIO, 2030 AND 2050 TIME HORIZONS Dynamic simulation for the 2030 and 2050 time horizons for future TEN-T planning</p>	<ul style="list-style-type: none"> • Eurasian rail freight is typically processed through Rotterdam, Hamburg, Duisburg, Tilburg and (other) TEN-T infrastructure. • Increased growth in trade and investments in Eurasian rail infrastructure are expected to impact the Eurasian rail freight flows in the future. • New technologies such as 3D printing, hyperloop and advanced IoT are also expected to have implications for LL2 corridors. 	<ul style="list-style-type: none"> • The simulation will take into account both Eurasian rail freight transport entering the R-ALP region and the potential shift of freight flows from Northwest European seaports to Mediterranean seaports stemming from BRI and TEN-T investments. • The analysis of these intercontinental corridor flows will enable the EGTC “Interregional Alliance for the Rhine-Alpine Corridor” to assess future implications for strategic regional corridor planning.

