FTL Intermodal Demonstrator

Integrating intermodal structural freight flows from supply and demand side through trusted collaboration

(Project Deliverable Report D.3.2)

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NexTrust Deliverable 3.2 Integrating intermodal freight flows – Demonstrator

Deliverable

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Document Owner	Bernd Weisweiler, TX Logistik AG
Contributors	Sebastian Ruckes, TX Logistik AG, Dr. Patrick Stumm, Pastu Consult Sprl
Checked by	NexTrust CT, Dr. Patrick Stumm
Authorised by	Coordinator

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1 Introduction, Goal and Objective

1.1 What is NexTrust?

The objective of the NEXTRUST project is to increase efficiency and sustainability in logistics by developing interconnected trusted collaborative networks along the entire supply chain. These trusted networks, built horizontally and vertically, will fully integrate shippers, LSPs and intermodal operators as equal partners. To reach a high level of sustainability, we will not only bundle freight volumes, but shift them off the road to intermodal rail and waterway. NEXTRUST will build these trusted networks ideally bottom up, with like-minded partners, adding multiple layers of transport flows that have been de-coupled and then re-connected more effectively along the supply chain.

The pilot cases cover the entire scope of the call and cover a broad cross section of entire supply chain (from raw material to end consumers) for multiple industries. The creation and validation of trusted collaborative networks will be market oriented and implemented at an accelerated rate for high impact. We expect our pilot cases to reduce deliveries by 20%-40% and with modal shift to reduce GHG emissions by 40%-70%. Load factors will increase by 50%-60% given our emphasis on back-load/modal shift initiatives. NEXTRUST will achieve a high impact with improved asset utilization and logistics cost efficiency, creating a sustainable, competitive arena for European logistics that will be an inspirational example for the market.

1.2 Structure of NexTrust (WPs) and Positioning of the Pilot Cases within it

The trusted collaborative networks, built horizontally and vertically, shall fully integrate shippers, logistics service providers (LSP) and intermodal operators. In this way, collaborative trusted networks can reach high levels of sustainability, as they will not only bundle freight volumes, but shift them off the road to intermodal rail and waterway.

A particular challenge of the development of intermodal services is that the operators need to have enough freight volumes to start up services, thus being able to optimize their assets and offer a competitive price compared to pure road transportation. Trusted collaborative networks in the supply chain shall significantly enhance the level of “critical” mass for intermodal services, improving the capacity of transport assets. The objective is therefore to use the same

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methodologies employed to optimize shipper networks (as WP1 and WP2), but focus the initiative on collaboration from the LSP and intermodal operator network perspective. In this way, LSP road transportation can also optimize asset capacity by building up sustainable collaboration. Overall, these trusted networks shall significantly increase the flow volumes enable LSPs and intermodal service providers to run their services in a more sustainable, environmentally friendly manner, while having a cost competitive service compared to pure road transportation.

1.3 Goal of the Pilot Case Category 3.1

The pilot case looked into structural freight flows of the intermodal service provider TX Logistik across 10 European countries and how best to interlink them with structural freight flows of shippers transported today by road. In this way the shipper freight flows require to identify and match. This would already find a sufficient volume base to be shifted off the road.

The main goals of the pilot case category 3.1 are the following

- *How to increase the quantity of freight flows for the TX Logistik rail network across 10 European countries?*
- *How to convert FTL road shipper flows to intermodal rail service through trusted collaboration, matching up supply and demand?*

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2 General Description, including Need and Problems

The situation today is that the FTLs in scope are transported mainly via road causing high emissions of greenhouse gases (GHG). Eurostat data from November 2014 reveals that, among the inland transport modes in EU for freight, road transportation continues to account for the biggest share with about 75%. Railway's share of the freight transport market is steady and low with around 18%. While freight will probably continue to be transported by truck when it comes to short distances, freight transportation over medium and long distances can be shifted to the rail mode to increase the environmental sustainability of the European Transport System.
Today there is no trusted environment in place to share transport flows between shipper and LSPs in order to analyse a potential shift to intermodal.

Looking into the current 'as-is' business model, it emerges that the market players have already undertaken a lot of efforts in bundling cargo flows and shift them off the road. The key business model currently in place is the so called "intermodal operator", who acts as independent intermediary or kind of broker between intermodal companies and potential customer groups. The intermodal operator purchases transport capacity from rail or shipping companies and sells the capacity to several other competing carriers. Some European intermodal operators have also established a legal entity where the shareholders are mainly the carriers or other intermodal undertakings to be able to bundle cargo and share the risk with a common joint-venture.

However, the intermodal operator is organised between the door-to-door carrier and with the intermodal suppliers, and there is no direct involvement with the end-customers, i.e. the shippers. With this role as intermediary at the supply level, there is no direct control about freight flows to be transported and with each shipper tender a new carrier could be assigned, - who is often not using the intermodal service capacity from the previous carrier or is technically not able to continue to transport in an environment-friendly way. This 'as-is' situation feature will be addressed further when discussing the 'to-be' situation.

In the railway sector, the intermodal operator is sharing the risk in three different scenarios:

- Carrier takes fix commitment for rail slots → Risk is with carrier.
- Operator sells rail capacity on demand → Risk is with operator.

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• Carriers takes partial commitment (e.g.1/3 of the train), Operator sells free rail capacity on demand → shard risk between carrier and operator

In Figure 3 below, we visualise the current general business model of the 'as-is' situation.

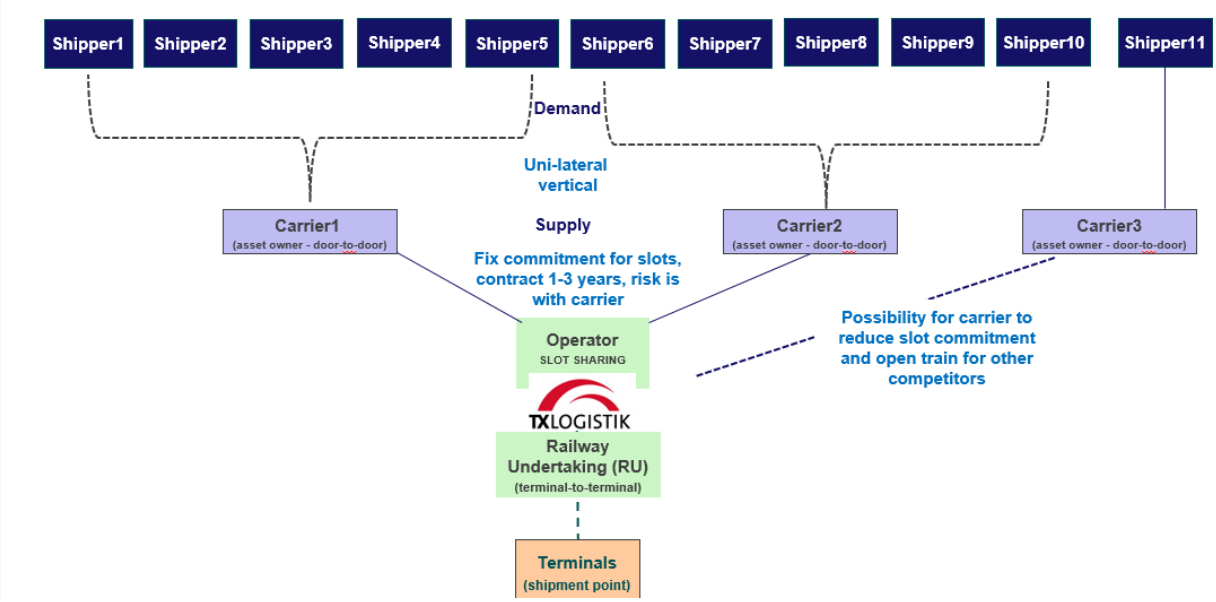

Figure: 'As-is-model'

To illustrate these evolutions, the International Union of Railways (UIC) has summarised the development of the CT / intermodal operator business model and shows that nowadays, shipper, carrier and railway undertaking are taking the risk of the train utilisation. This is illustrated below in Figure:

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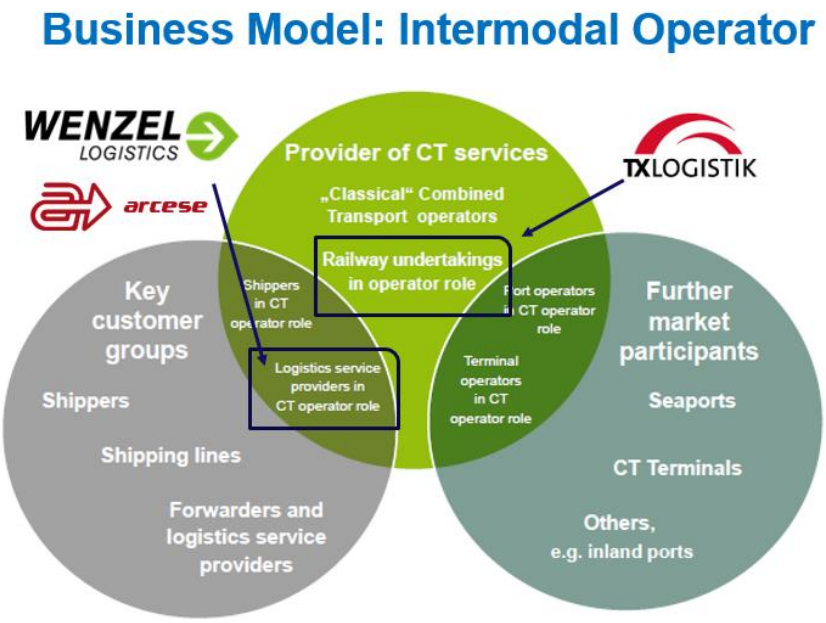

Figure: Intermodal operator business model

Some of the involved partners of the NexTrust pilot cases also have established company trains, such as the LSPs Wenzel Logistics and Arcese, or the railway undertaking TX Logistik, which is also serving an operator and sells capacity to two or more competing carriers.

'As-is' situation of pilot category 3.1

The "as-is" situation of the pilot category 3.1 is based on the TX rail network, which is placed on five TEN-T core network corridors (the North Sea-Baltic, Scandinavian-Mediterranean, Rhine-Alpine, Atlantic, and Rhine-Danube), as visualised below in **Error! Reference source not found.**. TX has its own railway assets, such as 65 electric locomotives, 200 loco drivers and 1.700 rail wagons.

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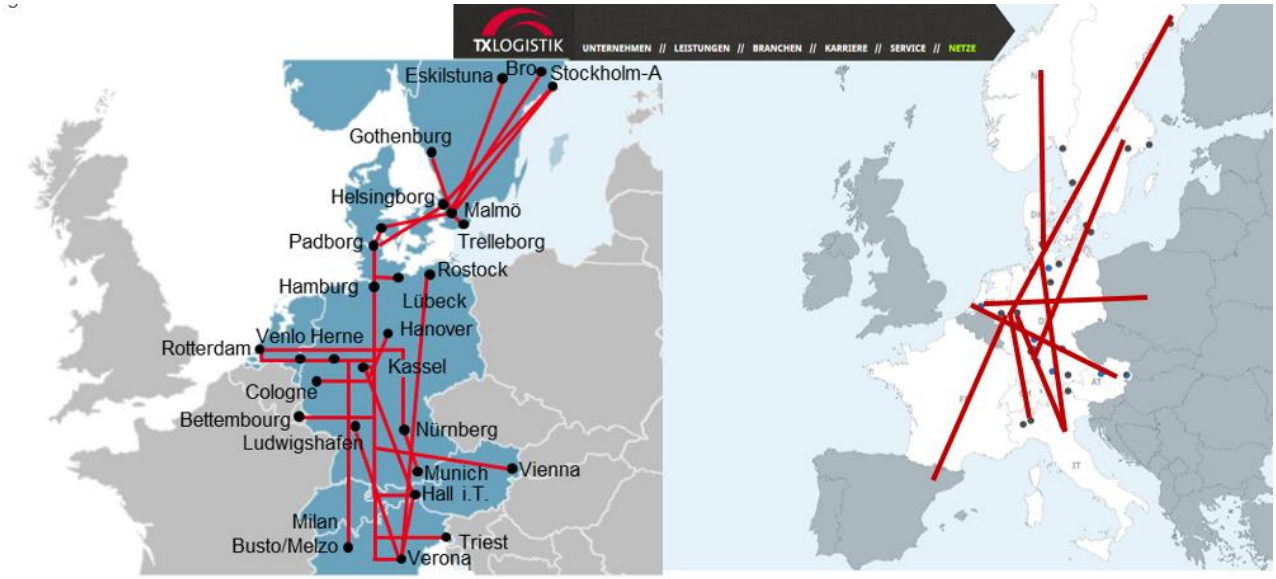

Figure: TX network

The intermodal transport service, also called “Combined transport” (CT) has additional challenging market conditions:

- Supply chain and freight flow transportation is cost-driven
- Road transportation is the dominant and generally cheapest mode
- Intermodal transportation must compensate extra loading/unloading costs
- Intermodal transportation is static and less flexible, involving a lot of actors
- Intermodal “production” costs (e.g. rail track charges, infrastructure and energy costs) are increasing more than road
- Capital-intense equipment needed

This leads to certain constraints in intermodal transportation, which are listed as follows:

- usually solely roundtrips are feasible (balanced transport flows needed)
- critical mass is needed for an efficient operation (full use of capacity per train in average are 30-33 semi-trailers equ. 90-100 TEU)
- special loading equipment and know how needed

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3 The Results of the Application of the NexTrust Business Model

In the research analysis and discussions it emerged that for the improvement of the above described inefficiency situation, TX Logistik shall try to collaborate vertically with their customers, the carriers and together with the carriers also directly with the owners of goods, the shippers.

The research activities looked into the appropriate business model of NexTrust to understand how with this new and innovative way of trusted collaboration, an existing intermodal railway service network can be optimized and shift more traffic off the road.

3.1 The 3-step-methodology for setting up trusted collaboration

The NexTrust demonstrator conducted its research activities and applied the 3-step methodology unique to the project.

The 3-step approach has following phases:

- Step 1) Identification
- Step 2) Preparation
- Step 3) Operation

The time frame for each step in this research activity was approximately 6 to 12 months, summing up to a pilot case life cycle of up to 36 months. The methodology can be further developed, accelerated and validated for building effective, scalable collaborative FTL transport networks, which can then be deployed in the market, once the EU research activities are completed.

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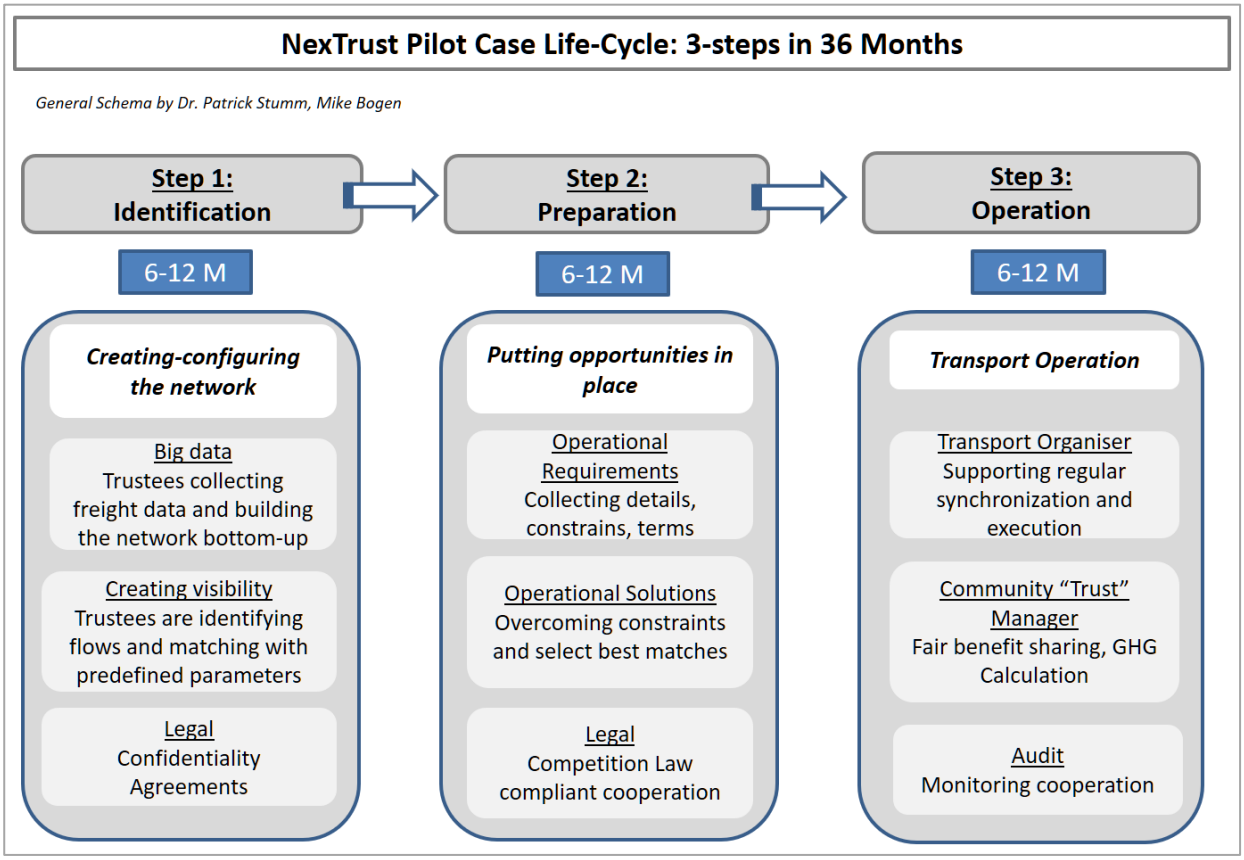

Figure: 3-step-methodology

Step 1) Identification phase of the FTL demonstrator

In the identification phase, the trustee collects and analyses transport flow data of shippers who have expressed the interest to identify collaboration synergies between them. It is important that this process is managed in complete confidentiality - supported with agreement between partners - and that any information is shared only and exclusively through the trustee. The precondition is the design of an EU competition compliant legal framework that defines how to handle the collected data between the stakeholders. The role of the trustee in this framework has to be absolutely neutral and free of commercial conflict of interest. The "mapping & matching" analyses of transport data flows are executed with specialized, cloud-based "big data" ICT tools. This was done with the IT collaboration platform ELG-Web provided by the NexTrust partner Giventis.

The identification phase to identify synergies can be described as "bottom up", organic approach for building sustainable collaborative networks. The trustee is using appropriate ICT tools, without the need to rely on a massive central database. The NexTrust FTL demonstrator very much follows

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the business philosophy of "think globally, act locally" with regards to building trusted collaborative networks.

The trustee will help the participants in a collaboration to identify, set up and organize the pilot cases by first collecting individually from the proposed participants some transport data for the express purpose of matching this data with the similar data of other collaboration candidates. The focus is on identifying if there are any potential 'collaborative matches' for freight flow bundling on identical or compatible lanes to develop more sustainable solutions. It is as if an impartial observer would take a helicopter view to look for bundling chances across the millions of structural freight flows and transport asset movements that exist everywhere in the European transport market. The first trust step is an important building block. The identification process is designed to identify potential partners and thus initiate first trusted relationships that can be scaled up to demonstration pilots.

Step 2) Preparation phase of the FTL demonstrator

In the preparation phase, it is the trustee's responsibility to facilitate the development of business cases of several shippers to support specific collaboration scenarios and in this role act as an arbitrator to overcome any barriers or constraints to the collaboration. Just as in the identification step, this requires a "tool kit" of processes, methodologies and ICT tools covering all aspects of trusted collaboration, including but not limited to legal agreements providing for applicable rules of engagement that cover partner gain sharing, entry/exit terms, supplier selection and expected behaviour between the partners. In many situations, the trustee may also facilitate market discovery in an anti-trust compliant environment through various means.

Step 3) Operation phase of the FTL demonstrator

In the operation phase, the trustee implements the collaborative agreement (rules of engagement), and supports the actual operations of the collaboration scenario on an on-going basis. For this purpose appropriate ICT tools are needed for an efficient and streamlined management process. The trustee also audits the actual operations to ensure that the rules of engagement are followed and that gains delineated in the collaboration agreement are actually accrued.

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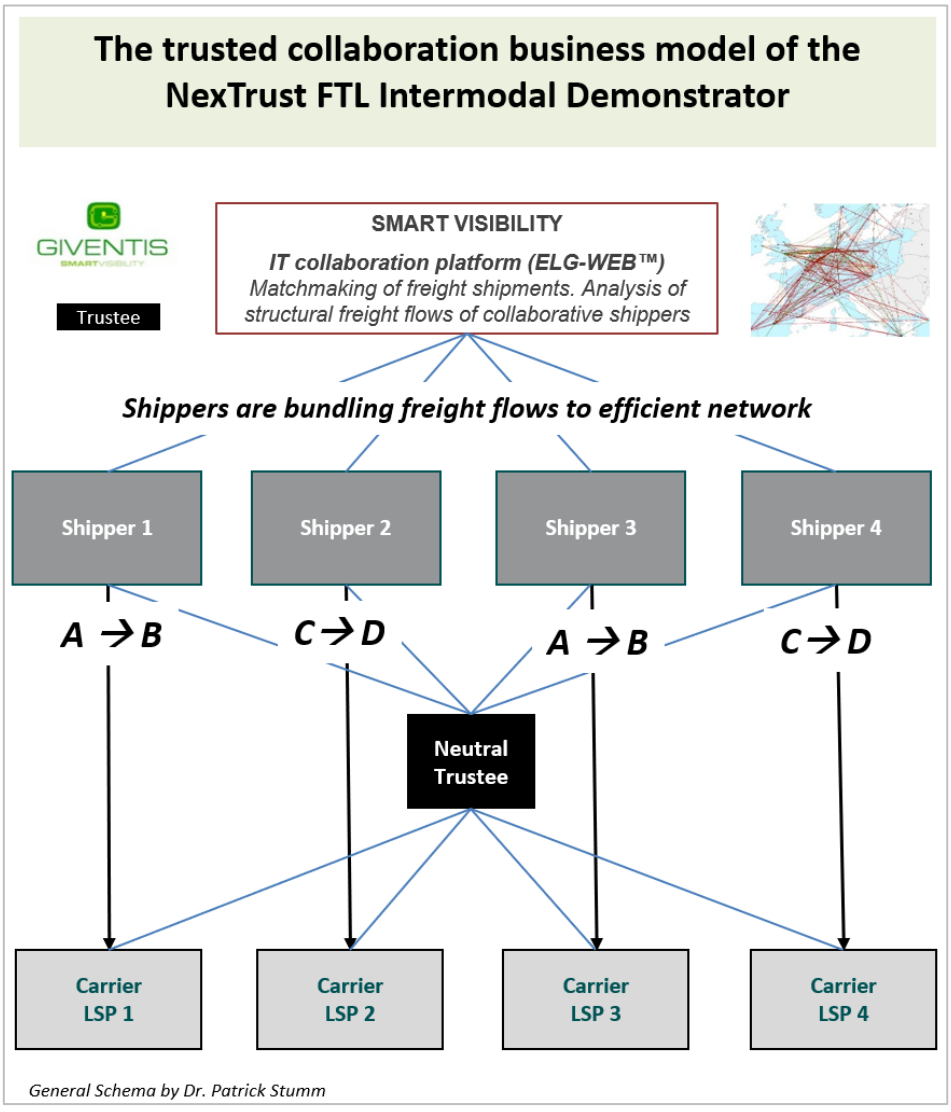
3.2 The introduction of the neutral trustee to support collaboration

The NexTrust intermodal FTL demonstrator has hereby two main service functions of the trustee, as also visualized in the figure below:

- First, the service is categorized as a “Transport optimizer”, which includes transport flow matchmaking to identify synergies between partners.
- Second, the service function is providing “trust”, where the trustee is acting as independent, neutral and confidential provider for several shippers. The trustee enables the collaboration journey, from identification of freight flows through preparation of the collaboration, supporting the actual execution.



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The trustee for the FTL demonstrator worked as a team, in particular the NexTrust partners, Giventis and Pastu. The role of Giventis was particularly important to identify and match transport flow data of shippers. Giventis has a dedicated IT collaboration platform 'ELG-Web' offering a unique on-demand web based service that helps clients to re-engineer and optimize their transport networks. The tool gives visibility to intermodal FTL bundling opportunities.

The legal support for the FTL demonstrator was provided by NexTrust partner Kneppelhout.

Overview of the neutral trustees for the FTL intermodal Demonstrator

Neutral Trustees	***Short Description***	***3-step involvement***
pastu green	*Pastu Green is the division responsible for innovative sustainable business solutions with special expertise in the transportation and logistics sector, such as, full-truck-loads and intermodal sector.*	*Involved in the entire life-cycle of setting up intermodal collaborative pilot cases*
GIVENTIS	*Giventis is an information services company, offering a unique on-demand web based service that helps clients to re-engineer and optimize their transport networks by providing actionable business intelligence.*	*Involved in the entire life-cycle of setting up collaborative pilot cases* *IT optimization platform ELG*
KNEPPELHOUT KORTHALS LAWYERS	*Kneppelhout is a law firm with broad expertise in international business law, among others in corporate and commercial law, IP and privacy law, competition law and transport law.*	*Support for any legal questions which may arise.*

3.2 The integration of TX network and Shipper network

Phase I of the 3-step-methodolgy comprises data collection, matchmaking and identification of opportunities. Following task 3.1.1 we identified the appropriate intermodal characteristics to be integrated in the structural freight flow. This was crucial as certain restrictions apply in intermodal transportation (e.g. profile/height of a loading unit). As TX Logistik operates from terminal-to-terminal, we needed to geo-code current terminals in the TX intermodal network in order to be able to match these against door-to-door flows (zip-code based) provided by shippers. Thus we had to define a certain catchment area around each terminal allowing a reasonable distance with regards to first/mile transportation costs and taking into account the direction of terminal location and loading/unloading locations. The general approach of defining feasible catchment areas is shown in Figure.

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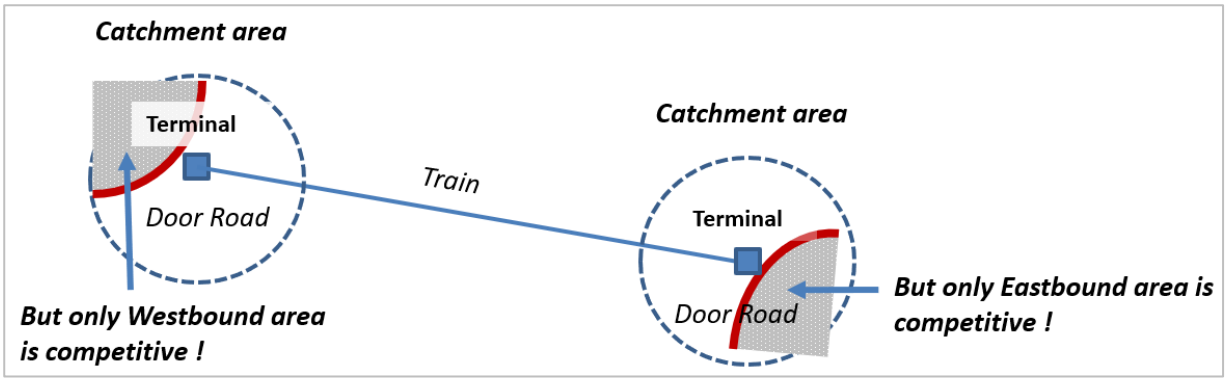

Figure: Illustration of catchment area

In order to create the interface for freight flows of shippers with the existing TX intermodal rail network (task 3.1.2) we used the ELG-interface (see deliverable 2.1) and enriched this with the intermodal specific parameters analysed in task 3.1.1. The interface has been tested and validated (task 3.1.3), adjustments have been made based upon feedback collected during this testing period.

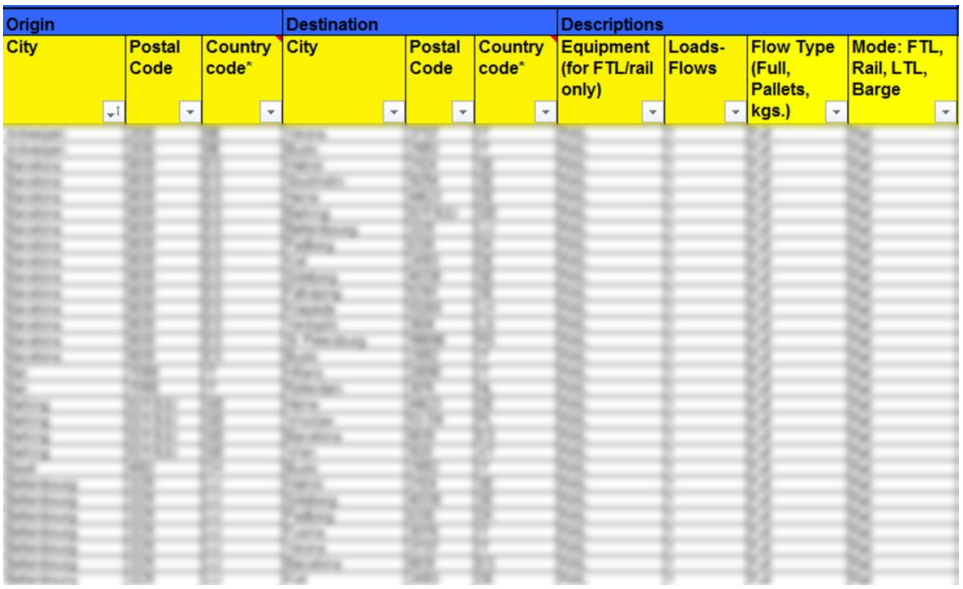

Figure 1: ELG interface

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The flows provided by shippers were matched in the course of a first analysis in 04/2016 against the current TX network. Overall 17 flows (incl. 3 backload flows) matched against the current TX network. In total we have identified 5756 FTL, see Table 1.

Match #	FTL	Country Origin	Country Destination	backload (FTL)	Temperature requirements
1	838	DE	NL	0	ambient
2	85	DE	BE	0	ambient
3	31	DE	SE	0	temperature controlled
4	504	NL	SE	0	temperature controlled
5	100	NL	DE	0	ambient
6	342	HU	NL	0	temperature controlled
7	600	IT	BE	0	temperature controlled
8	437	DE	IT	486	temperature controlled
9	1178	BE	IT	0	temperature controlled
10	54	DE	CZ	0	ambient
11	43	IT	NL	0	ambient
12	543	IT	BE	161	temperature controlled
13	69	IT	DE	0	ambient
14	144	AT	BE	141	temperature controlled
TOTAL	**4968**			**788**	

Table 1: FTL flows matched with current TX network (1st round)

Transport flows shall be shifted off the road to intermodal, facilitated by the NexTrust 3-step-methodology. The trusted environment has been setup (supported by KKL) by signing NDAs between partners involved as well as introducing trustees.

After that, transport flows have been shared with trustees GIV and PAS in order to match and identify synergies. The results have been shared with parties concerned and opportunities have been discussed.

Out of these matches, we could start a pilot case in operational phase, involving SHIPPER1-CARRIER1-TX on the lane Hannover area (Germany) and Milano (Italy) with a matching backload from Hall greater area (Austria) to Hannover greater area (match no. 8). The first and last mile on road is transported by freight forwarder SHIPPER 1, which has been invited as pilot participant. As SHIPPER 1 has cranable reefer containers available, we found a perfect match. Operational and contractual questions have been solved and go decision for operation was taken in July 2016.

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Overall, the pilot category 3.1 applied successfully the 3-step methodology and achieved success with two Pilot Cases in advanced stage:

- TX – CARRIER 1– SHIPPER 1 (operation phase)
- TX - SHIPPER 2 (preparation phase)

Within the joint WP2/WP3 activities (T2.2.2 / 2.3.1 and 3.1.4) we have analysed to setup new intermodal lanes, provided the critical mass therefore is given. Here we take into account all available and planned flows (NexTrust shippers, pilot members, TX customers) and identify main routes that are feasible to setup a new intermodal lane. At this stage the analysis showed high volumes between Poland and UK, which would allow to set up a new intermodal lane. However we once again were facing the challenge of missing backloads from UK to Poland. In this respect we have been looking into various scenarios to identify needed backloads (e.g. stop in Rotterdam or Ruhr area, Germany)

As further shippers have provided freight flows during the course of the project, an additional analysis has been made in November 2017. Table 2 shows an excerpt of the most relevant matches.

Match #	**FTL**	**Country Origin**	**Country Destination**	**backload (FTL)**	**Temperature requirements**
1	1364	Hungary	Germany		
2	128	Denmark	Italy		
3	1641	Austria	Netherlands		
4	1652	Italy	Netherlands	1308	
5	2880	Germany	Italy		
6	1226	Germany	Austria	656	
TOTAL	8891			1964	

Table: FTL flows matched with current TX network (2nd round, excerpt)

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4 The ‘to-be’ situation of Integrating intermodal structural freight flows

4.1 The ‘to-be’ situation business model

In pilot case category 3.1, the trustee model is added to the railway undertaking and operator TX Logistik, who is “producing” the train from terminal to terminal and in the same time sells slot capacity to one or several competing carriers. A representation of this business model is given below in Figure 6.

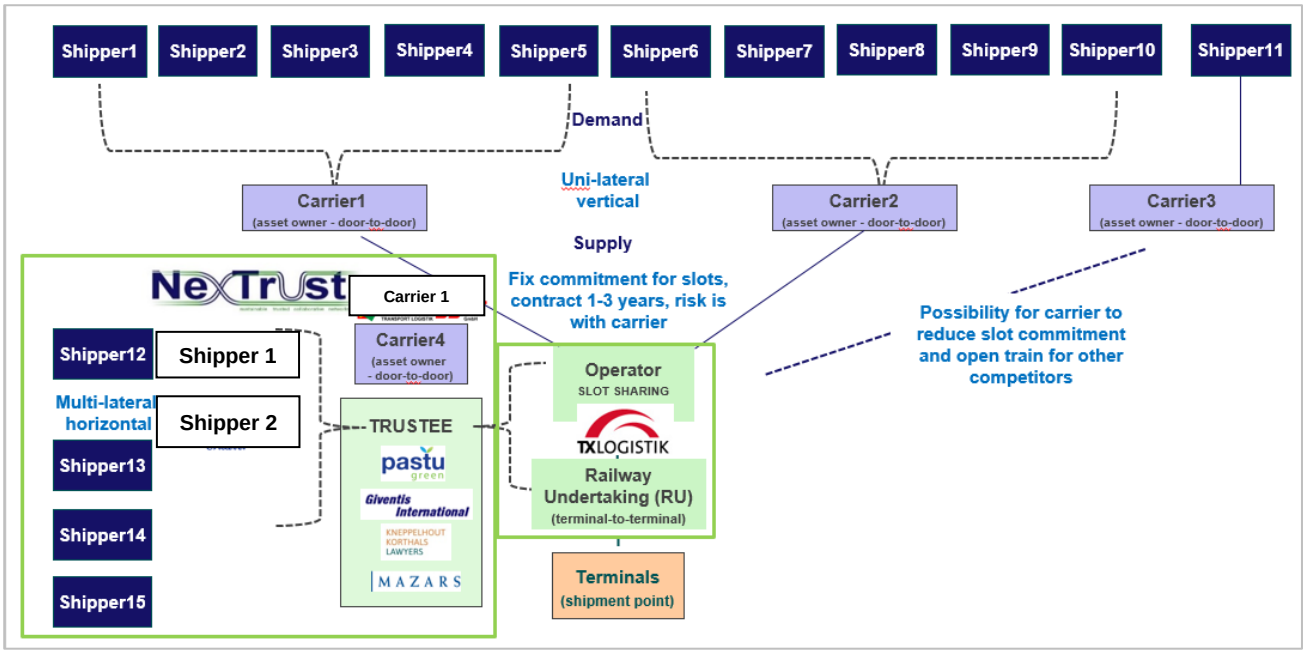

Figure: ‘To-be-model’

In this new business model a trustee facilitates horizontal and vertical cooperations between all partners involved. This allows a fair risk sharing and to overcome constraints when setting up and operating combined transportation services (see chapter 2). Furthermore it enables competing companies to join cooperation whilst ensuring anti-trust compliance.

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As described before, one pilot case of 3.1 between TX and SHIPPER 1 has reached operational phase and will shift road FTLs off the road to rail. As SHIPPER 1 is requesting one supplier for door-to-door carriage, TX as terminal-to-terminal provider has been looking for a door-to-door carrier with own assets, who is willing and interested to enter in the vertical extended collaboration. CARRIER 1 joined this collaboration and is offering the door-to-door service to the identified road FTL flows of the SHIPPER 1. An agreement to start operations among the partners was achieved by end of June 2016 and the pilot has been set up for first pilot shipments. A visual representation of this to-be state is given below in Figure 45.

In the first phase, there were 400 to 500 FTLs in scope from Hannover greater area to Milano greater area, with backhaul from Hall (Austria) greater area. The terminals for the southbound flows are Hannover and Verona, for the northbound (backload), the intermodal transhipment point is Hall in Tirol and Hannover. The FTLs in target are part of the EU defined multimodal "Scandinavian-Mediterranean" core network corridor.

A second pilot case has been intended to start with TX and SHIPPER 2. Here a total of 1178 FTLs have been identified (match #9). However we were facing challenges of missing backloads as well as price competitiveness with road transportation. This pilot has been halted in preparational stage.

4.2 The impact calculation on carbon emissions in the to-be situation

The neutral trustee is also responsible for the calculation of the Key Performance Indicators (KPI), which is for the FTL intermodal demonstrator mainly the reduction of carbon emissions.
The scientific partner of NexTrust, the VU Amsterdam, was analysing the GHG accounting in depth and published an internal deliverable report with a recommendation for the NexTrust partners to use a GHG calculation framework. Following VU Amsterdam, the challenge is that there no single globally recognized and accepted standard for calculating GHG (including CO2) emissions along supply chains. Stakeholders agree, however, that a common global approach is necessary to improve transport and supply chain sustainability. Given the large number of players aiming for lower CO2 emissions, many methods and tools have been developed over the last decade. A subset of these methodologies and tools are commonly used in the industry and, therefore, particularly useful for the NexTrust project. VU Amsterdam recommended that EN16258 and GLEC (Global Logistics Emissions Council) guidelines should be followed.

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The actual GHG calculation was then done by the trustees, because for the calculation access to commercially sensitive information is required. For example, the fuel consumption is needed, but this information is considered to be very confidential, as from this parameter, the costs behind the price can be released. In the same way, the payload and number of vehicle movements from production plant (origin) to warehouse (destination) can lead to market share knowledge of shippers and production size.

The GHG emission calculation of the FTL collaboration pilot cases used following main data input as summarized in the table below.

GHG calculation: Data input			
1	Weight Vehicle	x	tonnes
2	Payload	x	tonnes
3	travel distance	x	km
4	travel time inclusive truck driver rest period EU directive	x	hours
5	fuel consumption vehicle	x	liter / 100 KM
6	refrigerated cargo: Fuel consumption	x	litre/hr
7	Emission factor (WTW)	x	kg CO2e/kg fuel
8	Specific Weight diesel	x	kg/l

As some of the FTL shipments are temperature controlled and are in the need for refrigerated transport, the trustee needed to calculate the fuel consumption for refrigerating the goods multiplied with the travel time.

Additionally, the trustee based some calculations on industry defaults and average values as real time data was not always accessible. We received input data from carriers who are tracking in detail the fuel consumption, distance and travel time with onboard units at the vehicles. The consumption factor followed the GLEC framework and common scientific knowledge.

It was also agreed among the partners that for the purpose of demonstrating the sustainable impact, the approach to work with averages and industry default values is satisfactory, as the deviation from default to actual values are minor. The objective of the NexTrust FTL demonstrator is to show the reduction potential and not the actual detailed accountable carbon emission, where there are many methods and tools available, but not one harmonized global set. The challenge for the shippers are also that, if they have once chosen one accountable GHG methodology, they need to understand in detail what has changed due to the change of methodology or due to the change of innovation activities. This first assessment indicates this pilot is expected to reduce GHG emissions by 51%..

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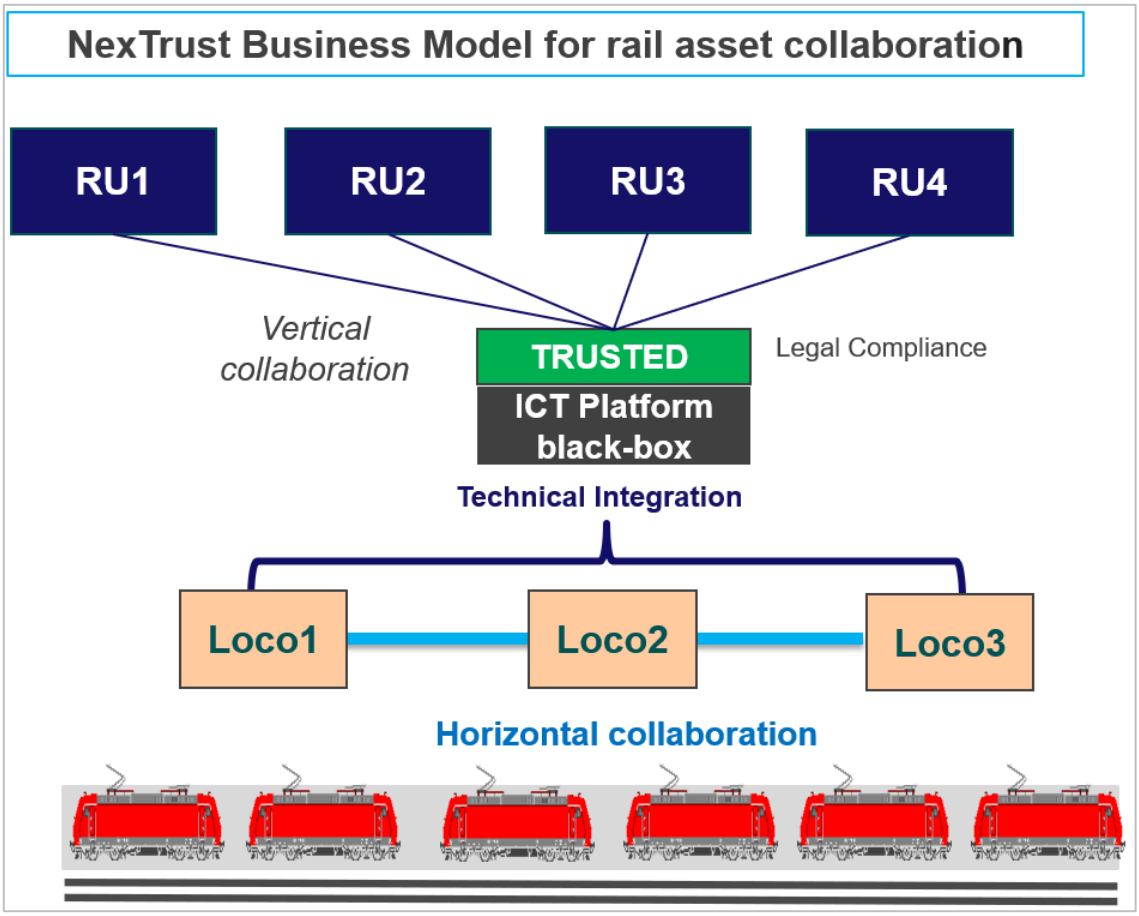
4.3 Collaboration between suppliers of Intermodal Railway Assets

In railway freight services, there is strong pressure to best utilize capital-intense equipment (locomotives, wagons, etc) and to tackle resource shortage at the same time in order to be competitive. Within in the course of the project NexTrust we found that there is no efficient and trusted approach for collaboration between suppliers of combined transportation (CT). Thus we within the pilot task T3.1.5, the research team started to identify the collaboration approach through an efficient exchange of resources needed for combined transportation.

Below we outline the NexTrust business model for rail asset collaboration. The RU's (railway undertakings) can via a trusted ICT platform and via a trustee as service provider technically integrate the locomotive resources available on the market.



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In this frame a concept for collaboration within the railway industry has been developed and will be tested. This includes an online platform, which allows stakeholders to easily place offers and requests regarding specific resources (starting with locomotives) in a legal compliant way.

A working group comprising locomotive leasing companies and railway undertakings has defined parameters and features, which will be implemented in a demonstrator of the collaborative online platform. In a second stage the demonstrator as well as the overall concept will be introduced to a larger group of potential participants, allowing incorporating further input. First feedback received from relevant stakeholders confirmed the need for such a collaborative approach.

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5 Lessons Learnt and Outlook

Unlike matching FTL flows, we were facing specific challenges in converting transport flows for intermodal transportation. This relates to the fact that different parameters and specific constraints apply than shippers used to know form road transportation. Thus we experienced following challenges when setting up pilots:

Shippers expect door-to-door transportation and preferably a single business partner when sourcing transportation. Being a railway operator, TX usually offers terminal-to-terminal connections. We learned that a door-to-door solution is mandatory for shippers and we had to work out a feasible setup. It turned out that involving freight forwarders currently working for the respective shippers had little or none intermodal experience (specific planning and organization) and not the resources available with regards to intermodal transportation (esp. cranable equipment).

We also faced reluctance by some freight forwarders, when being approached by TX in order to offer first/last mile transportation. Some feared to risk their business, as they claim to be the sole contact for shippers. This shows that more needs to be done to highlight the benefits when participating in NexTrust and to pay attention to the benefit sharing model within NexTrust.

Another challenge has been that predominantly temperature-controlled flows were matched with the TX network, which made things more complicated as freight forwarder specialised on temperature controlled transport are limited in general and usually do not have cranable reefer equipment.

Finally, we came to the conclusion to better work with freight forwarders having experience with intermodal transportation, and thus having the required equipment available.

Shippers are providing predominately one-way flows, which was another challenge we were facing. In intermodal transportation it is crucial to have a backload available, as – in opposite to road transportation – usually only A-B-A connections allow an efficient operation. In the identification phase we found only two flows with an adequate backload. In addition to find suitable freight

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forwarders for the first/last mile transportation, we could not offer a competitive pricing to shippers, as (mostly) no backload was available.

Besides we experienced that - even if all above mentioned operational challenges could be solved - we finally failed to start a pilot due to pricing. We learned that some shippers are very price sensitive and do not accept to pay (significantly) more than they pay for road transportation.

This effect has been intensified by the diesel price from 2015 to 2016, which was on the lowest level for over more than one decade (see Figure 4).

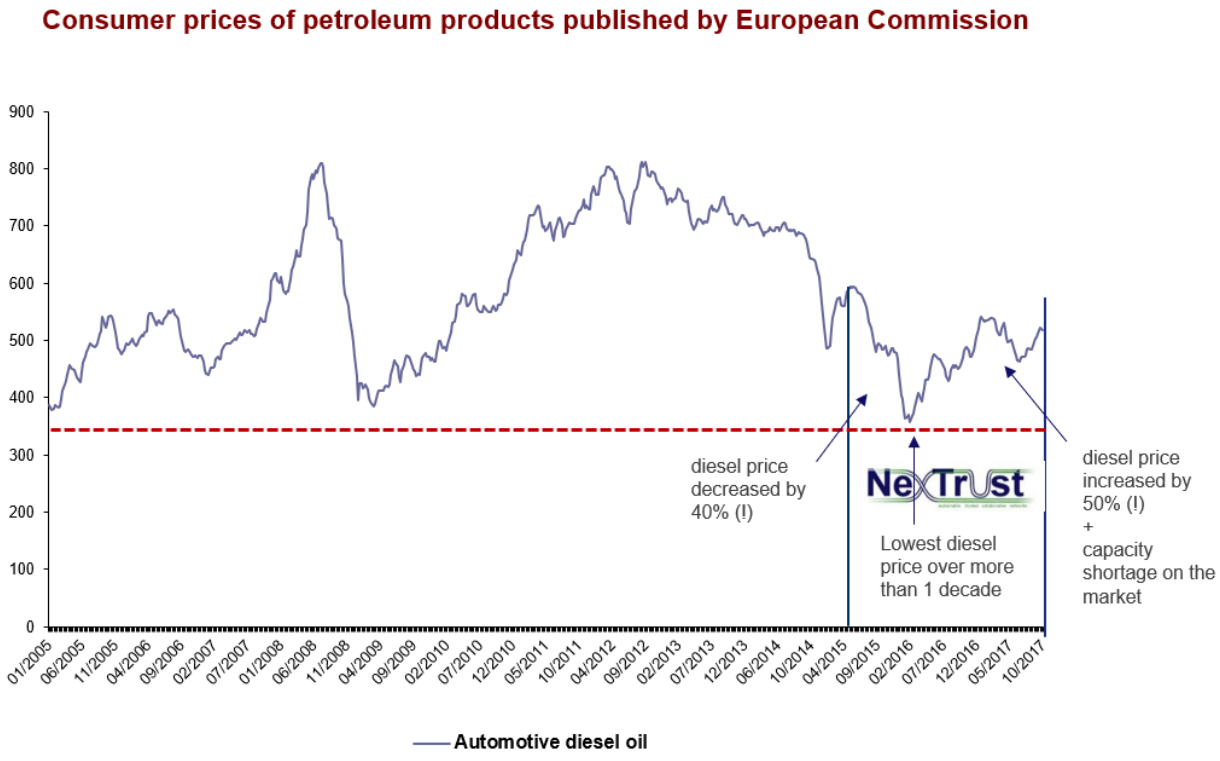

Figure: Diesel oil price 2005-2017

With regards of matching FTL flows with the *current* TX intermodal network, we will continue discussions with shippers and pilot members and keep the database up-to-date. On a regular base we will update and match shipper's flows with our network.

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We will further contact freight forwarders (esp. specialised on temperature controlled transportation) in order to overcome the challenge of having suitable carriers for first/last mile transportation. In this respect we will underline the NexTrust business model and benefits involved for all partners.

In order to address the fact that freight forwarders are lacking cranable (reefer) equipment, we will focus on promoting our NIKRASA system. NIKRASA is an innovative technology which allows to lift non-cranable (standard) trailers on a wagon with the help of a special platform (see Figure 5). The benefit is that freight forwarders do not need to invest in cranable equipment and can avoid the complexity of planning the needed (cranable) trailer at the right place.

Figure 1: NIKRASA system

The NIKRASA system is in particular interesting for the intermodal pilot cases as many flows provided from shippers are temperature-controlled. Bearing in mind that freight forwarders with cranable reefer equipment are very rare, there is a good opportunity to broaden the potential scope of freight forwarders for first/last mile transportation.

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References

Add here the project references:

[1] www.nextrust-project.eu project website

[2]

Acronyms and Abbreviations

Before issuing a document, check that all used acronyms and abbreviations are listed in the table in this section.
Please list **only** the acronyms used in the document

ACROYNM	EXPLANATION
2D	2 Degrees Network
ARC	Arcese Transporti
BDF	Beiersdorf
BLU	Bluewave
BOR	Borealis L A T
CI (dissemination level)	Classified, as referred to in Commission Decision 2001/844/EC
C-ITS	Co-operative Intelligent Transport Systems
CO (Dissemination level)	Confidential
COL	Colruyt Group
CRI	CRITT Transport et Logistique
CT	Co-ordination team
DEC (deliverable type)	Websites, patent fillings, videos, etc.
DEL	Delhaize
DEM (deliverable type)	Demonstrator, Pilot, Prototype
EC	European Commission
ELU	ELUPEG
EVO	EVO Dutch Shippers Council
FIEGE	FIEGE Logistik
FTL	Full Truck Load
GHG	Green House Gas
GIV	Giventis
GPP	General Project Partners
GS1-BE	GS1 Belgilux
GS1-CH	GS1 Switzerland
GS1-D	GS1 Germany
HUB	NexTrust Collaboration Hub
ICT	Information and Communications Technology
INEA	Innovation and Networks Executive Agency

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KC	Kimberly-Clark Europe
KKL	Kneppelhout & Korthals
LSP	Logistics Service Provider
LTL	Less Than Truckload
MS1	Milestone Number
NIB	Nextrust Industry Board
NOR	Norwegian Logistics
NPPC	Nextrust Pilot Participation Community
PAN	Panasonic Europe
PAS	Pastu Consult
PING	Pinguin Foods Polska
PU (Dissemination level)	Public
R (deliverable type)	Document, Report
RV1	Review Number
SME	Small and Medium-sized Enterprise
TRL	Technical Readiness Levels
TRV	Tri-Vizor
TX	TX Logistik
VLE	Vlerick Business School
VU	VU University of Amsterdam
WEN	Wenzel Logistics
WKTS	Wolters Kluwer Transport Services
WP	Work Package
WPL	Work Package Leader
WPLG	Work Package Leader Group
YSC	Ysco

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