LL #13 Terminal Flow (BetTerFlow)

FACTSHEET

10 MARCH 2022

A. GENERAL (Business case)

1. Objectives

- Cargo/goods tracking
- To optimize data flow within and between terminals, esp rail road terminal *"Hillskär"* in Umeå, and between shipper and the customer, using applied standardised digital collaboration
- Application of the Collaborative Decision Making concept (CDM),
- To enhance the attractiveness for cargo transports utilizing multi-modal transport.
- Supply chain resilience

2. Main emphasis

To demonstrate how digital information exchange based on CDM principles - based on experience from PortCDM, StationCDM and related methodologies – enable two terminals connected by rail increased planning ability, i.e. to better predict and parse for potential disruptions in the transport system and thus create better basis for improved decisions. By sharing different time stamps, associated with transportation of the goods, it creates possibilities for goods owner and transporters to use more multimodal transports in their transports of goods. In transportation all shifting of transport - e.g., from a truck to a train or from a ship to a train – is currently perceived as an increased risk of a delay and possible damage of the cargo.

The railroad terminal Hillskär, operational in 2022 aims to serve and offer its customers, wants to provide the train operators', value-creating services (which they in turn can use to create added value services for their customers, the freight forwarders). For this to be possible for the railway operators to provide, there are expectations on digital services to be provided by the terminal. Examples of such digital services could be, the weight of the cargo carriers, time for arrival of the carriers, time for loading and unloading, pick-up and leaving of the trucks and where

on the train the cargo should be loaded. By sharing time stamps concerning physical movements and status of operations, both as estimates and actual times, involved actors in the goods flow are being informed about current status as well as actors' intentions, to enhance their ability to plan and/or re-plan their respective operations.

3. Challenges

- To identify and address improvement potential in transhipment processes to enhance the overall transport flow based on value added digital services., eg efficiencies in loading and unloading of carriers, storage of carriers and shunting of carriers to and from the ferry.
- Collaboration with LivingLab #5, RFID in rail, and Radio Frequency Identification (RFID) readers will be installed in the port of Umeå to retrieve data of trains and wagons arriving and departing the Hillskär terminal

4. Transport mode

Train, Sea (ferry), also including tugmaster, and reachstacker.

5. EU Map Focus

Scandinavian – Mediterranean corridor and it might also have links to non-EU countries.

6. Geographical coverage

Umeå and different places in Finland and Sweden.

7. Actors

- RISE,
- Kvarken Ports,
- INAB,
- Swedish Transport Administration,
- NLC Ferry,
- Wasaline,
- Umeå Hamn AB,
- Hillskär future terminal operator,
- Ahola,
- Attracs

8. Forecast scaling outside LL

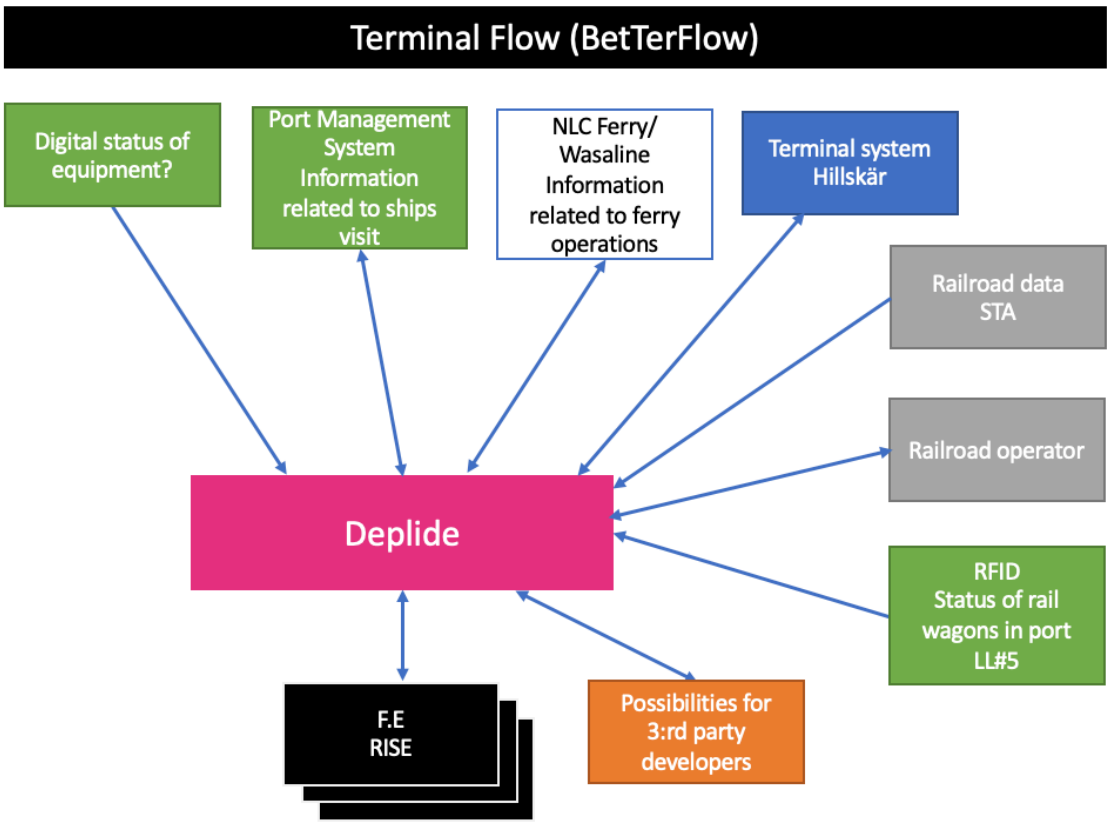
The intentions are to use this a proof of concept to facilitate for other similar terminals, ferry operators, train operators and ports interested in optimizing their multimodal goods flow by using standardised digital collaboration as a mean to increase efficiency and coordination capabilities and at the same time being more sustainable, by shorten the time from idea to implementation. Example of scaling could be to show other transport hubs how they can use RFID (based on the collaboration with LL#5) to monitor trains arriving to and from the port.

B. TECHNICAL SETTING

9. ICT vs physical

This LivingLab aims to access to data held in various different systems and to connect these data sets to Deplide. In some cases this could imply the purchase and implementation of a technical infrastructure enable to share certain types of information, e.g., RFID readers tested in LivingLab #5 to retrieve and share data of trains movements to, from and within the port. The focus is on the goods flow coming with train to the railway terminal Hillskär in Umeå to be transhipped via the ferry and to further be transported either by train, or truck from Finland and vice versa. This increases the demand for integration of information between different collaborating actors in the transport system and demonstrate how an increased digital collaboration between the different actors creates better basis for planning of the goods flow.

The Research Platform "Deplide" - developed by RISE to demonstrate and evaluate services complementing the different systems – will be used as a flexible data sharing platform based on the open-source solution Kafka. Deplide is designed to be both vertically and horizontally scalable and complying with the leading principles defined by FEDeRATED. This approach allows the LivingLab to experiment and explore new services based on data sources such as IoT sensors, events from different systems such as planned and actual events in relation to goods transportation.



The actions pursued in the LivingLab will be on the transport hubs providing business services adding value to the transhipment of freight at the Hillskär train terminal and the ferry. BetTerFlow will use the CDM concepts (PortCDM and StationCDM) and related methodologies, to optimize flow and hubs throughout a designated distributed flow, from cargo owner to deliverance, by applied standardised digital collaboration. The LivingLab will apply the FEDeRATED principles on digital data sharing to demonstrate how standardize digital information exchange, can provide actors participating in the LivingLab an increased planning ability and an opportunity to predict and parse for potential disruptions in the system and thus better basis for decisions.

This Living Lab deals with the following FEDeRATED global features:

- Semantics
- Access
- Findability
- Identity

10. DTLF implementation option

Focus will be on

B. Single Platform
C. Multiple platforms

This Living Lab will use the research and innovation data information sharing platform Deplide to share data between different actors involved in the Living Lab, it will be different systems and devices connected to the platform for data sharing and different Front-End applications will be developed to visualize data.

C. ORGANISATIONAL ASPECTS

11. Success factors

- use of a data sharing environment and an increased situational awareness among the involved actors based on digital information (qualitative);
- use and availability of connected data sources, e.g., RFID readers and railroad data, such as estimates and actuals of train arrivals (quantitative).
- Increased planning horizon for involved actors
- Better prediction for transhipment of cargo between transport means, eg., ferry and train and vice versa
- Better prediction for operations of unloading and loading of operations related to cargo movements in the terminal
- Better basis for decisions for involved actors
- Better basis for billing of services related to goods distribution for involved actors
- Potential for prioritising cargo movements
- Potential for re-planning of goods onboard the ferry
- Reduced administrative burden
- Real-time sharing and access to transport and goods related data

12. Risks

- COVID pandemic having adverse effect on cargo import and export organizations.
- New (COVID) outbreaks, shutdowns and lack of semi-conductors slowing down delivery of equipment and implementation of physical infrastructure;
- Potential delay in access to data, lack of personnel and physical meetings due to the pandemic could cause delays.
- Lack of access to digital data for demonstration due to, e.g., being real-time data from goods trains.

13. Timing

LL#13	2019				2020				2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Preparations																				
Planning and scoping																				
Stakeholder engagement																				
LL infrastructure development																				
Testing & piloting																				
Iteration & process analysis																				
Operational trials																				
Feedback & scaling																				

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