LL #14 Sustainable Intermodal Chain (SIMC)

FACTSHEET

30 SEPTEMBER 2022

A. GENERAL (BUSINESS CASE)

1.Objectives

- Transport and cargo tracking
- Enhance supply chain visibility enabling effective planning of intermodal - trucks and ferry –through cross border data sharing between different nodes/hubs/and place of interest.
- Optimize asset management and cross border transport
- Establish foundations for calculating CO2 emission along the supply chain,
- Reduce administrative burdens.

2. Main emphasis

The goal is the integration of transport information across the end-to-end supply chain channelled to the control centre of the transport buyer. Ports provide opportunities for inter-modal shifts engaging a multitude of actors. Cargo owners and transport buyers are dependent on ports as transhipment hubs and have a strong desire to achieve services that would be value-adding in the composition of the transport chain activities bringing goods from point of origin to point of destination.

The aim is

- To secure that the two transport hubs covered by Kvarken ports are established with digital data sharing capabilities providing predictions and progress of the movement of freight within and between the two transport hubs and adding value to the transhipment of freight.
- The ferry company Wasaline operates the ferry route between Kvarken Ports Vaasa and Umeå and with the two ports. As Ahola has the interface to the cargo owner, its need for information and opportunities to provide information services will be taken as the point of departure.

- To collaboratively engage in providing offers to the different parties in the value chain to incentivise the use of transport services of which Kvarken ports and Wasaline are put at the core.
- To establish foundations for calculating CO2 emission along the supply chain, enhanced planning capabilities, and reduced administrative burden.

Cargo is transported by truck coming from different locations to Umeå and continuing with ferry for further transportation Vaasa or trucks coming with the ferry from Vaasa to Umeå. There is also potential for looking at trailers being left in either Umeå or Vaasa by truck and then pulled onboard the ferry for further transport, either by a new truck or by train.

3. Challenges

- Current inefficiencies in the integration between the different transport events occurring in the chain from cargo owner to the end-customer. The part of the transport chain involving participating actors in the LivingLab will be used as a foundation for generating best practices to adopt in other parts of the chain as well.
- Develop standardised data sharing between up-stream and down-stream information sharing environments (communities).

4. Transport mode

Road (trucks), Sea (ferry). Possibly Rail

5. EU Map Focus

The Midway Alignment with the EU freight corridors Scandinavian-Mediterranean (Scan-Med) corridor on the Swedish side and North Sea Baltic on the Finnish side.

6. Geographical coverage

Sweden and Finland.

7. Actors/SMs

- RISE,
- Kvarken Ports,
- INAB,
- Swedish Transport Administration,

- NLC Ferry,
- Wasaline,
- Ahola,
- Attracs

8. Forecast scaling outside LL

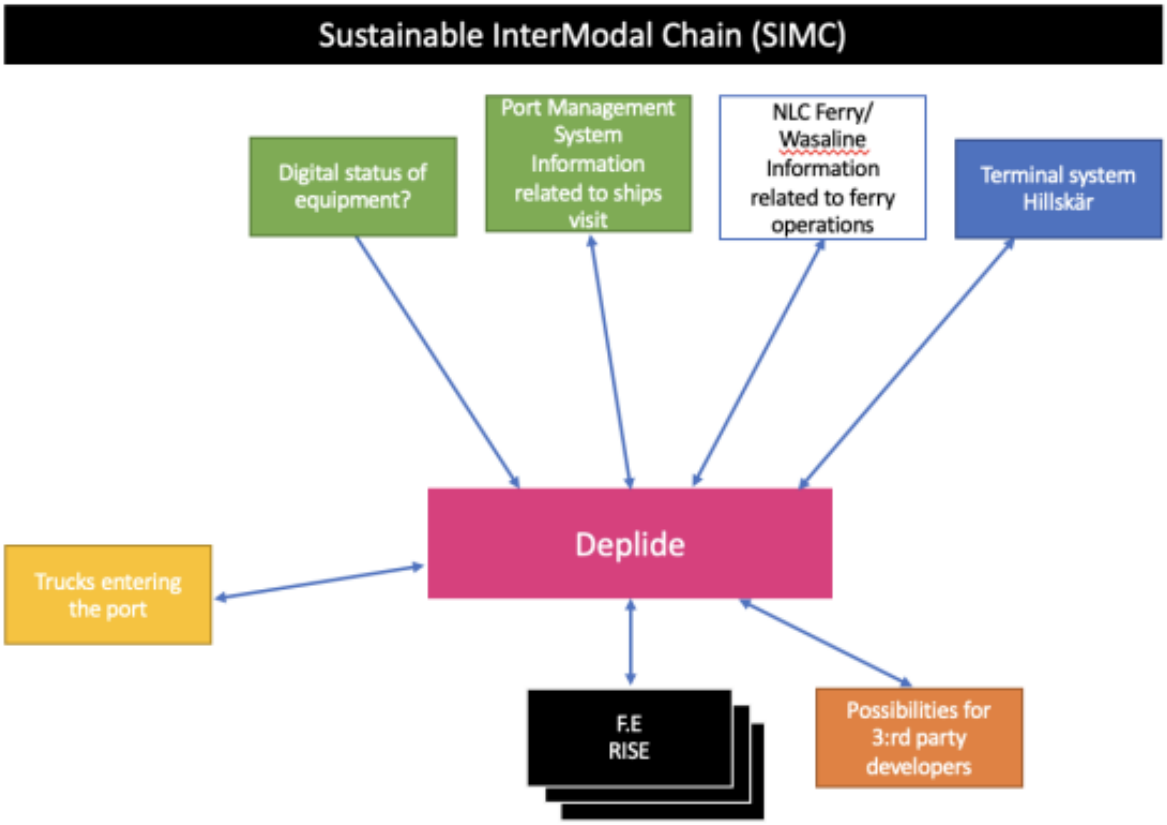
The concept developed in this LivingLab is primarily aimed to be used for adoption by other control towers, transport carriers, and transhipment hubs.

B. TECHNICAL SETTING

9. ICT vs physical

This LivingLab is working on getting access to data from different systems and to connect those data sets to Deplide, which in some cases means purchase and installing technical infrastructure to be able to share certain types of information. This is done to meet the increased demand of integration of information between different collaborating actors in the transport system. Kvarken Ports is in the process of acquiring port management system (PMS), this provides the port with possibilities of digitally sharing information with other actors in the port through the Research Platform "Deplide".

In this LivingLab a Terminal Operating System (TOS) like system based on identified requirements will also be tested with Deplide, the platform developed by RISE to demonstrate and evaluate services complementing the connectivity between the port and Wasaline. Deplide is 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, events from different systems such as planned and actual events in relation to goods transportation.



SIMC applies the FEDeRATED principles on digital data sharing to align the transport buyer and transport producer. This LivingLab will explore several of the leading principles of FEDeRATED associated to connecting data sharing environments, such as

- electronic/digital format putting focus on how to encode information digitally,
- using a revisable structured format; user capabilities putting focus on the capabilities, i.e. the actions that may be performed,
- ensuring identified users are transparent to all other relevant users/organizations; and federation putting focus on how to organize the sharing or accessing of data with others.

10. DTLF implementation option:

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. Deplide will will connect different systems and devices for data sharing and will develop different Front-End applications to visualize data.

C. ORGANISATIONAL ASPECTS

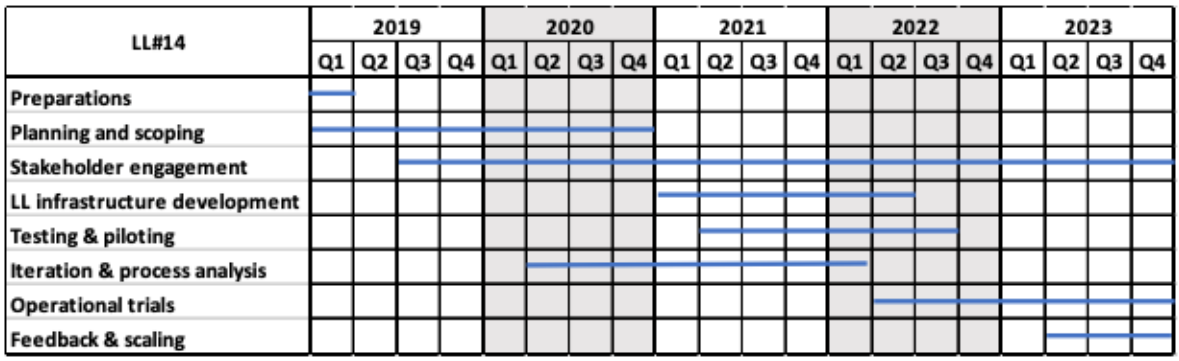
11. (Potential) Impacts

- Increased situational awareness among the involved actors based on digital information (qualitatitve), including connected data sources, e.g., RFID readers and railroad data, such as estimates and actuals of train arrivals
- Better prediction for operations of unloading and loading of the ferry
- Better basis for decisions for involved actors
- Better possibilities to inform drivers to meet the check in time for the ferry
- Better planning possibilities for the ferry operator if truck will meet the check in time for the ferry
- Potential for prioritising goods being shipped with the ferry
- Potential for re-planning of goods onboard the ferry
- Reduced administrative burden
- Increased possibilities to inform forwarding agent and haulage company about no shows or cargo onboard
- Real-time sharing and access to transport and goods related data

12. Risks

- COVID pandemic having adverse effect on cargo import and export organizations.
- Supply chain disruptions, incl 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 e.g., data on positions of trucks related to sensitivity of goods onboard the trucks.

13. Timing



14. Contact

Mathias Karlsson, Researcher, Digital Systems, RISE, mathias.karlsson@ri.se
Mikael Lind, Senior Research Advisor, Maritime Operations, RISE, mikael.lind@ri.se
Kenneth Lind, Senior Researcher, Digital Systems, kenneth.lind@ri.se