TECHNICAL AND NON-TECHNICAL SOLUTIONS

With the increase of cargo volume nowadays, the demand of physical infrastructure might increase.

However, the overall efficiency could also be improved by employing digital infrastructure and communication methods during the cargo transportation. The main idea is to achieve the maximum utilization rate of the available infrastructure, technology, and other kinds of resources. Together with a collaborative environment, it will be possible to reduce transport emissions in our corridors and result efficient transportation. Today`s transport infrastructure investments must correspond and adapt to the tomorrow`s transport demand and requirements.

But there are always divided opinions about **which measures should be implemented** and **how they should be implemented** in a problem situation.

It is important to analyze the situation, identify bottlenecks and find the most appropriate solution. This can be both technical and non-technical.

KINDS OF BOTTLENECKS:

- Institutional bottlenecks
- Operational bottlenecks
- Technical bottlenecks

TWO TYPES OF SOLUTIONS:

- Hard investments and technical solutions

They are are related to tangible assets - improved road infrastructure, efficient public transport, modern freight fleet, appropriate terminal location, or revised operations inside terminals.

- Soft investments and non-technical solutions

They help to overcome non-technical barriers such as absence of cross-border collaboration or lack of expertise or poor information flow.

HOW TO START

Step 1

Re-think (non-technical solutions)

The first step is to first and foremost consider measures that may affect the need for transport and travel as well as the choice of mode of transport.

Examples of measures: Localization, land use, taxes, fees, parking fees, subsidies, collaboration, travel-free meetings, speed limit, coordinated distribution, information, marketing, travel plans and programs and so on.

Step 2

Optimize (non-technical solutions)

The second step is to investigate whether it is possible to use existing infrastructure in a more efficient way.

Examples of measures: redistribution of areas, bus lanes, signal prioritization, ITS solutions, special operations, coordinated train schedule, increased frequency, logistics solutions, travel planners and so on.

Step 3

Rebuild (technical solutions)

In the third step, it is tested whether it is possible to solve the problem through a minor rebuild by, for example, adding lanes, adding an intersection, extending a platform or other alternatives.

Examples of measures: reinforcements, trimming measures, bearing capacity measures, widening, platform extension, bypass tracks, ascent fields, dredging in fairways, ITS solutions, level crossings, installation tracks and more.

Step 4

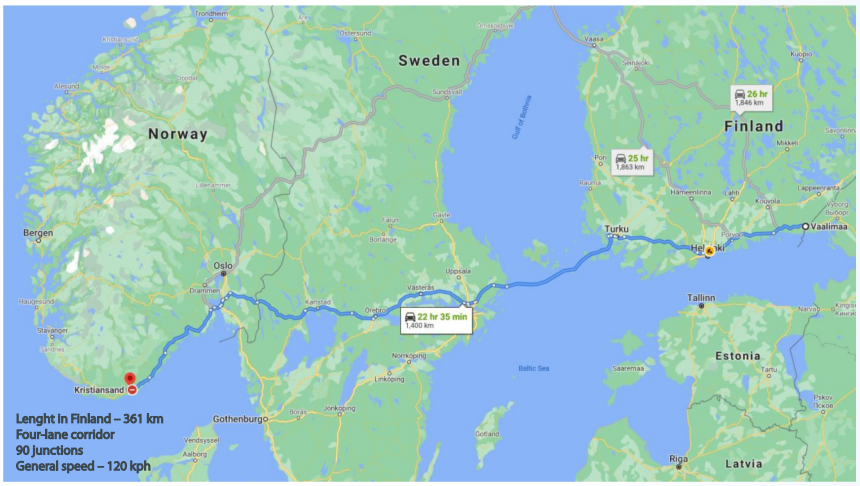
Build new (technical solutions)

The fourth step is performed if the need cannot be met in the three previous steps. This means new investments and/or major redevelopment measures. This part is the most costly measure / solution.

TECHNICAL SOLUTIONS ALONG THE CORRIDORS to reduce transport time, bottlenecks and emissions

Basic data concerning amount of traffic, heavy duty vehicles as well as rush hours was collected with the help of statistics, interviews, and meetings and own field trips along the corridor.

Challenges for freight transport relate to point-by-point improvement needs (industrial and logistics centers, ports), in some places deficiencies in the road network from the point of view of heavy vehicles (road network narrowness, access, bridges, bypasses) and congestion in urban / port entrances. In addition, there are problems with the number, location and services of heavy-duty break and rest areas.



The following criteria and issues have been taken into account when bottlenecks are described:

- Bottleneck location; Certain spot or longer segment
- Capacity, type and performance of infrastructure vs. traffic flow at the bottleneck
- The reason, why do the bottlenecks occur

DEVELOPING TERMINALS: optimize location and manage routine inside

LOCATION

THEORY

Factors which influence location decisions of terminals and logistics centers:

- Relative location to customers
- Relative location to suppliers and sourced material
- Regional land and property cost
- Accessibility based on transport infrastructure with different modes of transport
- Exchange rates
- Culture and social attitudes towards activities of people in nearby areas
- Regulations and decision-making by authorities on the use of areas
- Organization, industry and principle of operation of the company

/Rushton et al. (2014)/

PROOF TESTING

The Baltic Loop team tested proposed solutions by analyzing road section in Finland on international route E-18 as well as conducting an on-site survey at the ports and cargo terminals. Afterwards experts came up with detailed report and Handbook for terminal development to locate and plan future cargo terminals.

QUICK FACT #1

The terminal network on E18 route Finland and Sweden is crucial to domestic and international transport, within numerous cargo types, shippers, and receivers.

QUICK FACT #2

Delay conditions in transport corridors:

- weather conditions,
- constrained accessibility,
- lack of common cooperation,
- co-organization,
- concentrations,
- conflict interest of capacity usage,
- customs and border services,
- low frequency of service,
- current capacity of traffic,
- poor connectivity,
- lack of timely information.

To extend the bottlenecks, there are two major options:

- Build and open new distribution centers and logistics zones further beyound city centers with modern and sufficient land transport connections
- improve existing road, street and railway capacity between E18 junctions and current terminals by increasing number of lanes and changing old intersections into interchanges or at least fluent multi-lane roundabouts

QUICK FACT #3

The largest single expense for logistics operations comes from transport costs. As a result, the accessibility of the area through different modes of transport plays an important role in choosing the location of the logistics nodes.

QUICK FACT #4

In the optimal situation, the logistics centre would be located as close as possible to thecustomers, as well as the four main modes of transport: road, rail, port and airport.

QUICK FACT #5

The location of the logistics centre is subject not only to geographical requirements, but also to operational requirements. These include cooperation with the authorities, the pursuit of economies of scale, and internal cooperation.

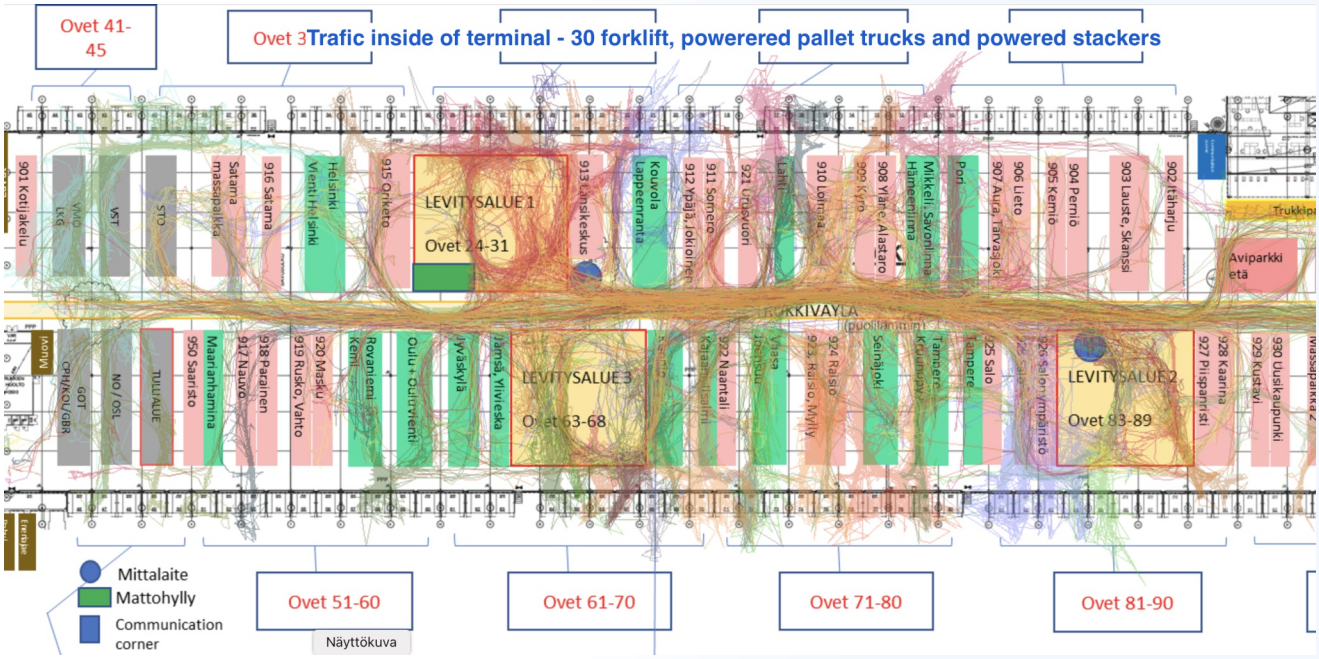
The location is often determined by the fact that the logisticshub`s operations are more focused on exports or imports. Import-oriented logistics centresare located mainly along the transport chain leading to the main market, while export-oriented logistics hubs are located in more near major transport terminals.

INSIDE THE TERMINAL

At the terminal, goods are transferred from one means of transport to another, either from trunk transport to distribution or from pick-up transport to trunk transport. The terminal does not store goods but should be empty twice a day.

Collecion of data before improvements:

- forklift and pallet truck movements
- shipment movements
- shipment volumes
- schedules, etc.



Ilustration of routes of 30 different forklift, powered pallet trucks and powered stackers.

Within the framework of Baltic Loop project involved experts came up with detailed report and Handbook for terminal development to locate and plan future cargo terminals.

Visit the project website – www.balticloop.eu to find some of our in-depth research!

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Åbo Akademi · Harjumaa Omavalitsuste Liit HOL · Region Örebro County · Riga Planning Region · Turku AMK Turku University of Applied Sciences · VHTP Ventspils High Technology Park · Vidzeme