POTENTIAL LOCATIONS FOR LOGISTICS CENTERS NEAR THE E18 ROAD IN THE SOUTHWEST FINLAND

WP 3

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1. Background

The aim of this report has been to find out potential new locations for logistics centres by the E18 road in Southwest Finland. This study deals with Baltic Loop activity linked with optimizing the E-18 cargo terminals.

The work deals with the current state of the E18 road and the logistics centres nearby it in Southwest Finland, the factors that affect for the location decisions of logistics centres, and also previous research about potential business districts in the area and also the business areas that are already in the development stage.

The report is based on logistic thesis work made by Jani Rantala (2020). Based on his data collection work a few potential future locations for logistics centres and villages were identified.

2. Are there locational problems of present cargo terminals?

Aim of this work is to find out where logistics companies should be located in the E18 growth corridor in Southwest Finland in the future, so that accessibility, land use, space and maintenance costs vs. trunk and distribution traffic, and the synergy benefits of several companies operating in the same area could develop from the current state.

3. Research methods, geographical area, and data

The main goal of this study lays on quantitative methods, *i.e.,* traffic volumes, distances, and travel time to the nearest ramp of the E18 route, the urban centres of Turku, Salo and Helsinki cities, as well as the ports.

The main source of data came from the 2014-16 logistics development plans submitted by the City of Salo, as well as the mapping of similar materials from Turku, Naantali, Lieto, Kaarina

and Paimio municipalities, on the websites of municipalities and from data provided already Baltic Loop as well. Professional literature and publications of transportation and logistics chains related to strategic location decisions of logistics companies are also used as source material.

Geographically, the research is limited to the E18 route and its immediate surroundings in Southwest Finland, in the region of Raisio, Naantali, Turku, Lieto, Kaarina, Paimio and Salo. The business and business premises-based demarsing covers terminals, distribution centres, central warehouses and transport companies operating them, which are the nodes for national trunk and regional distribution transport (Bentzen *et al* 2003).

4. Current state of the E18 corridor and logistics centres in SW Finland

There has been lot of activities at Baltic Loop project and in many other national and regional strategic development plans associated with E-18 corridor as part of TEN-network (*e.g.* Varsinais-Suomen liitto 2020, Linea-Konsultit & Varsinais-Suomen liitto 2014, Lahtinen & Pulli 2012, Rantala & Eckhardt 2011, Air-Ix & Rambol Finland 2011, Matrex and others Oy 2010).

The E18 leads across Europe in a west-easterly direction. It starts in Northern Ireland and ends in St. Petersburg, Russia. The E18 road in northern Europe is an integral part of the Nordic Triangle, which is part of the network of the EU's main transport links to be developed. In Finland, the section of the E18 road runs from Naantali and Turku via the Helsinki Metropolitan Area to the Vaalimaa border crossing to Russia.

Turku Ring Road is part of the E-18 that has the largest traffic volumes in Southwest Finland. In 2012, it moved an average of 8,400 to 32,000 vehicles per day. The highest daily traffic volumes were between the different level connections of Raisio town centre and Kausela junction, 28,700 to 32,000 vehicles per day. in the centre of Raisio and between 13,000 and 16,500 vehicles in the city centre of Naantali.

Heavy transport accounted for about 7-10% of traffic from Raisio to Kaarina, while the number in Naantali was significantly lower. Our previous studies revealed that this Ring Road sector also have to highest number road accidents and time delays as well.

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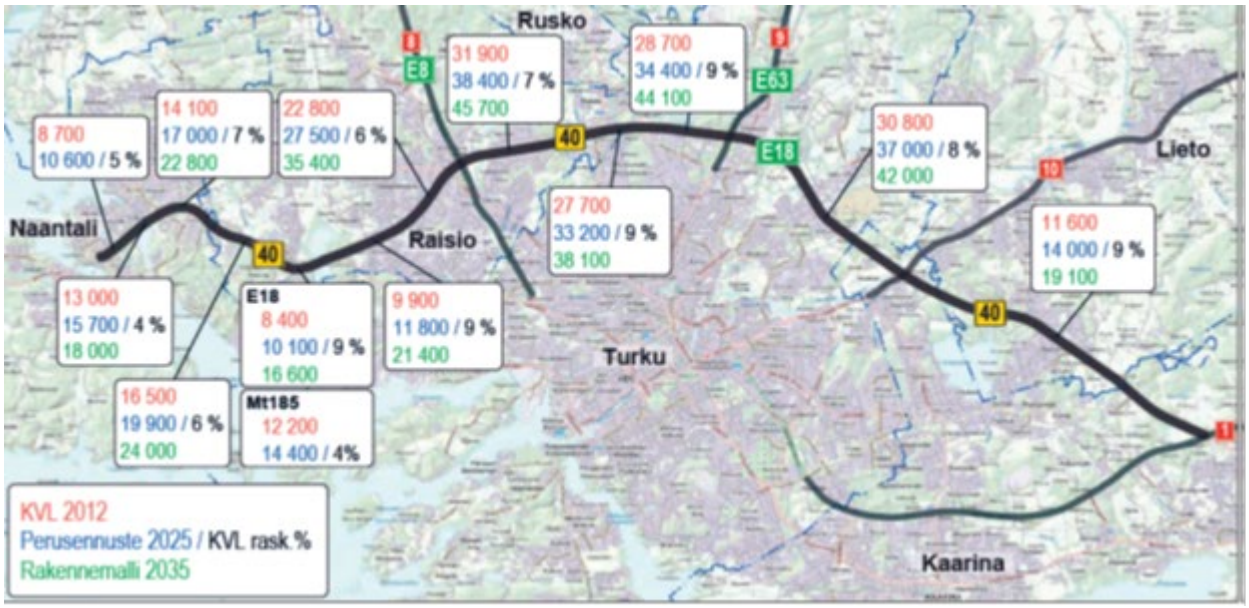

Figure 1. Traffic volumes on the Turku Ring Road in 2012, the basic forecast for 2025 and the forecast for the Turku region structural model for 2035. (Source: ELY Centre 2014).

Figure 2 shows (below) the average traffic volumes of Salo town main roads and E18 routes in 2012. The picture shows that traffic volumes on the E18 road in Salo town are around 11,000-14,500 vehicles per day. The largest volume of traffic on motorway connections is collected by the Piihovi junction with approximately 6,500 vehicles per day. At the other junctions the traffic volumes are below 1000 per day.

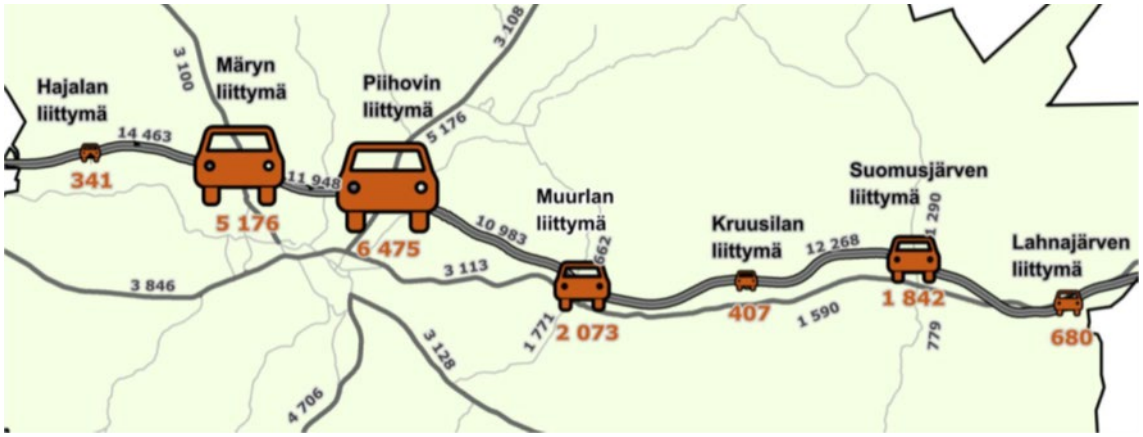

Figure 2. Traffic volumes of the E18 and motorway connections in Salo in 2012. (Source: City of Salo 2014).

5. Factors influencing the location decision of the logistics centre

The concept of a logistics centre is very broad and, and it can mean different things to users. However, in its true sense, the logistics centre is an area that includes operations for the transport, storage and distribution of products. As a general rule, it is an area in which the undertakings maintaining and carrying out the abovementioned activities are located. According to Lahtinen and Pulli (2012), Vadifis & Ojala (1999: logistics centres are classified into six different categories, Table 1).

Table 1: Classification of terminals (Source: Lahtinen & Pulli toim., 2012).

Luokka	Nimi	Määrittely
L0	Logistiikkavyöhyke	Logistiikkakeskittymien, -alueiden ja -keskusten muodostama, usein pääväylien suuntainen vyöhyke.
L1	Logistiikkakeskittymä	”Itsestään” muodostunut logistiikkakeskusten ja -alueiden tiivis ryhmä, usean hallinnoima, useita toimijoita.
L2	Logistiikka-alue	Järjestäytyneesti muodostunut, logistiikkatoiminnoille tarkoitettu alue, freight village, jossa useita logistiikkakeskuksia, varastoja yms. logistiikkatoimintoja lisäpalveluineen. Useita toimijoita.
L3	Logistiikkapalvelukeskus	Kaikille asiakkaille avoin logistiikkakeskus. Tietyn tahon hallinnoima, mahdollisesti useita toimijoita.
L4	Logistiikkakeskus	”Suljetun piirin” eli tietyn kauppaketjun tai teollisuusyrityksen oma logistiikkakeskus tai keskusvarasto, josta tavaraa toimitetaan vain ko. yrityksen omiin tarpeisiin.
L5	Varasto, Terminaali	Yksityisten omistamia varastoja yms.,pinta-ala alle 10 000 m2.

According to Harrison & van Hoek (2001) and Rodrique *et al* (2013) the logistics centre can use several modes of transport, such as rail, road, sea and air transport, and can serve as links between long-distance hull transport and local collection and distribution transport. Logistics centres can also provide value-added services in addition to transport and storage operations. These value-added services may include repackage, pricing, marking and putting goods ready for sale.

The logistics centre can form a cooperation network of great regional importance. Its development may be driven by a large number of regional actors, such as business and educational institutions. The purpose of this activity is to strengthen cooperation and marketing between the various actors in the whole region and to promote new investments in the area. (Lahtinen & Pulli 2012).

The choice of location of logistics centres may be property developer-driven, based on logistics companies, or it may be based on municipal development measures. The most important factors influencing the location of the logistics centre are transport costs in terms of deliveries and distribution, labour costs and availability, business premises costs, capacity for construction in terms of zoning and technical implementations, and good transport connections. The various factors influencing the location decision have been discussed in more detail below. Lahtinen & Pulli (2012), Meidute (2005).

There are several ways to in which logistic company can use time to help meet customer needs better thus adding more value. As pointed out by Lee *et al* (2009), the most common examples are

- increased responsiveness to customer needs
- increased variety
- increased product innovation
- improved return of new products

Despite to time-based approaches and their relevance to logistic management there are obvious barriers to their application. as well as limitations to its relevance. Two basic limitations to the need for time-based logistic management are the need for speed and the degree of speed needed. Inside the logistic centre is to generate visibility of the processes within the supply chain. Once this visibility has been achieved it is possible to benchmark similar processes. (*see* our soon coming report concerning time saving mappings inside logistic centre). The processes we need to map are the actual processes that are taking place. (Chapham *et all* 2001).

6. Geographical requirements

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.

In the optimal situation, the logistics centre would be located as close as possible to the customers, as well as the four main modes of transport: road, rail, port and airport. With good transport connections, the logistics centre manages to reach the agreed destinations as quickly and easily as possible. The location is often determined by the fact that the logistics hub`s operations are more focused on exports or imports. Import-oriented logistics centres are located mainly along the transport chain leading to the main market, while export-oriented logistics hubs are located in more near major transport terminals. The area where the logistics centre is located should be an already significant market. If the logistics centre

has a small market area, the centre's success is much more challenging. (Rodrigue, Comtois & Black. 2013.

7. Functional requirements for logistic centres

Logistics centres require a lot of space, so due to costs and space needs, the centres are often located not in town centres, but slightly outside cities. In addition, outside the cities avoid congestion in the centres. When establishing new logistics centre operations, it is advisable to look for areas that have already been zoned for logistics operations. In addition, it is worth paying attention to the fact that the basic infrastructure of the area, such as electricity, water, sewerage and possible supply routes to major transport routes, already exist. (Rodrigue, Comtois & Black. 2013).

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. Cooperation with the authorities is key to allowing the logistics centre to start its business as quickly as possible. With good cooperation, permit matters can be easier and the authorities are involved in the planning of the logistics centre. This, on the other hand, will make it easier to meet the requirements set by the authorities and to start and implement the construction work as quickly as possible. The economies of scale and more efficient operations can be achieved through cooperation between the different actors in logistics centres.

According to Winkler *et all* (2011) study the economies of scale and more efficient operations can be achieved through cooperation between the different actors in logistics centres. One of the basic ideas of the logistic centre's operations is that the goods to be transported are collected from several different operators and combined into one larger batch. This will create larger shipments, and cars will not have to leave half empty. In addition, the use of the same workforce among the different actors in the region can also be included in economies of scale.

According to Rodrique *et. al* (2013) The logistics hub`s internal cooperation enables the centre to become a well-functioning entity. Logistics operators in the region can use the same

workforce, which helps to save costs. In addition, when several companies in the same sector operate in the area, it is possible for operators to learn new things from other companies through cooperation and to use ideas that best suit their own operations to their own company.

8. New potential locations of logistic hubs along E-18

When exploring the new potential locations of logistics centres, several good options were found Three most potential locations for logistics centres were recognized. These areas are the Kirismäki business area in Piikkiö in Kaarina municipalities, the V8 business area in Raisio, and the Muurla junction area in Salo town.

Kirismäki business area

The Kirismäki business area is a new business area in Piikkiö, Kaarina, located at the intersection of the Turku Ring Road and highway 1. The location at the intersection of two major roads provides excellent logistical connections. The area is about 20 kilometers away from the centre of Turku.

Helsinki is about an hour and half away from the area and the ports of Turku and Naantali are less than thirty minutes' drive away. The area is especially suitable for logistics and industrial companies. The area is located relatively close to the centre of Turkuand Kaarina, so there is no problem with the availability of labour and their comfort.

Kirismäki's different level interface is heavily operated. In 2018, approximately 13,650 vehicles travelled between the different level connections of Kausela and Kirismäki per day, of which 1,480 were heavy vehicles. According to the 2040 forecast, the traffic volume will be approximately 19,000 vehicles per day. The average daily traffic on Highway 1 was approximately 16,300 vehicles at the Kirismäki interconnection, of which 780 are heavy vehicles. East of the interchange, the daily traffic volume on Highway 1 was approximately 24,500 vehicles, of which 1,920 were heavy vehicles.

At the moment, the road between Kausela and Kirismäki junctions is worse than the rest of Finland's E18 TEN-T road connection. The road is a two-lane mixed-lane road with a speed limit of 80 km/h. However, a development project is under way, which is expected to be completed in 2023. After this development project, the road will be four lanes in between and the speed limit will then be 100 km/h. These changes will improve the flow and safety of traffic. This, on the other hand, makes the Kirismäki area an even more attractive business area.

The same project also involved improving the different level interfaces in Kirismäki. The refurbished junction will make it particularly easier and smoother to drive from the ring road from Naantali town and Auranlaakso suburb to the motorway in the direction of Paimio and Helsinki – and vice versa. This change will also have a major positive impact on the safety and smoothness of the connection and traffic. The renewed interchange should be completed during 2021.

The town of Kaarina owns a large unbuilt planning area in the area. There is also an unbuilt business and logistic land reservations of private property in the along the planning area. However, much of the area is still unplanned with the respect of general land-use planning.

V8 Business Area

The V8 business district is a new business area north of Raisio town, located next to the name of Highway 8, on both sides of the road. The location of the area is excellent for logistics companies. It is located at a node for rubber bike traffic, *i.e*. near the junction of Highway 8 and E18. These roads have connections in the directions of Pori, Tampere, Hämeenlinna and Helsinki cities. In addition, Turku airport, the ports of Turku and Naantali and Turku railway station (see fig. 4) are located within a 10 km radius of the area.

The V8 business area covers approximately 320 hectares of total area and the building right in the area is approximately 120 hectares. Some of the plots in the area have already been zoned and priced. Approximately 20,000 vehicles pass through the area every day. The junction between Highway 8 and E18, known as the rubber bike hub, passes up to 50,000 vehicles in 24 hours. The traffic volume on the E18 road in the centre of Raisio is again around 23,000-31,000 vehicles per day.

To complete, the V8 business area will be a big potential business area in the future. There are still lots of space available for businesses in a large area, and the zoning of the area is well

under way. The new improved road arrangements on the E18 will improve the attractiveness of the area from the point of view of businesses. The city of Raisio has high expectations for the area and they are also ready to invest in it. Their goal is to make the V8 business area the most important business area of their future.

Figure 3. Location of V8 business and logistic area. The area is under development and will form together with Tuulissuo logistic area belt of logistic companies along the Turku Ring Road.

Märy junction

Märy junction area is located in town of Salo and serves as Salo's western entrance gate when coming from Turku. Märy's junction area is less than an hour and a half's drive from the Port of Helsinki and about 40 minutes to the Port of Turku. The connection to the centre of Salo is excellent, and the distance to the nearest services to the suburb of Halikko is about four kilometres.

The area is located in a natural direction of growth in terms of urban structure. One of the biggest attraction factors in the Märy junction area is its location and the volume of passing traffic on the junction is very high. It is overtaken by around 12,000-15,000 vehicles per day and more than 5,000 vehicles pass through the junction in 24 hours.

Märy area is partly located in a valuable and sensitive semiurban historical landscape area, which sets certain preconditions for construction in the area. The area is a different brand in its entirety in the nationally valuable landscape area of the Halikonjoki River. In other words, the landscape nature and image of the area must be utilised as an attraction factor by adapting new construction to a valuable environment.

The present business area is located, is best suited to business activities. The potential of the area applies to the extension of this business area south of the interface. In the southwestern quarter, next to the junction ramp, there is a total of approximately five hectares of town planned business area for service station and commercial buildings. The plots are already built, but there is still building space in the area. Transport and tourism services have been located in the area. Expanding the area will also help companies that already operate. In June 2020, the Salo town Council approved a new town plan for expanding the southwestern quarter.

The subplan of the centre of Halikko suburb has a designated area of private services and production activities for the southwestern quarter. The city owns lot of free space ownership in this area, totalling approximately 21 hectares, and the area is in the process of drawing up a development plan in cooperation with the business community.

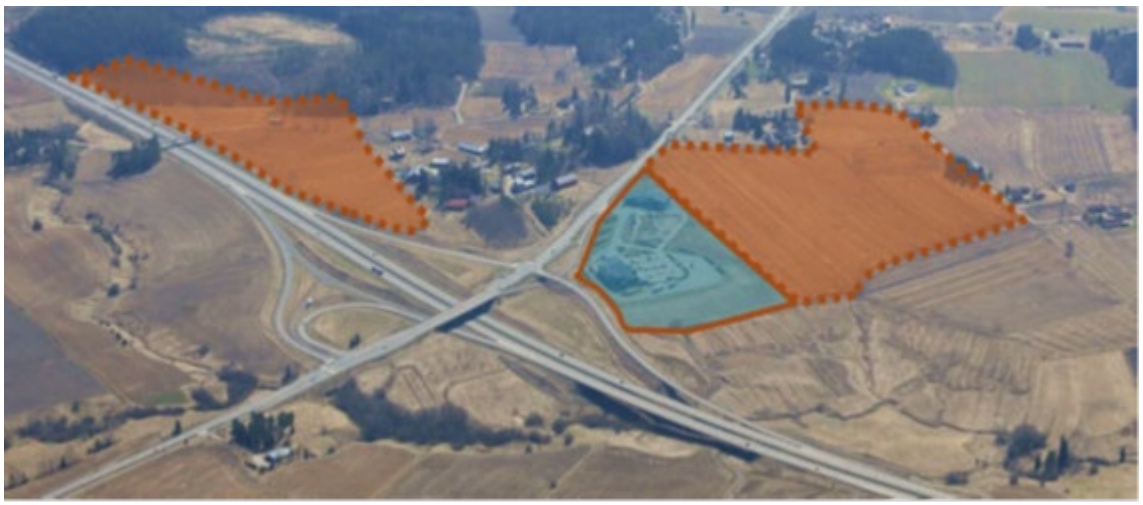

Figure 4. Mary junction. Present business area is blue. The potential new areas as shown as orange.

9. Results of terminal optimizing

The aim of the work was to explore new potential locations for logistics centres near the E18 growth route in Southwest Finland. The main focus of the survey of potential locations was based traffic volumes, distances and travel time to the nearest ramp of the E18 route, the urban centres of Turku, Salo and Helsinki, and the ports.

As a result, the optimizing showed three potential future locations of potential close to the E18 growth route were achieved, all of which have good transport links to ports and said urban centres, as well as the volumes of traffic passing by the regions are at a high level for everyone. the study did not go beyond the regional borders.

The aim was to find areas with a lot of development potential. Road development measures are underway or planned near the Kirismäki business area and Raisio's V8 business area to improve the service level. Once these works have been completed, the potential of the area will increase due to the flow of traffic. The development potential of the Märy junction area, on the other hand, comes from the region's expansion potential.

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