FROM COAST TO BORDER

Exploring the Northern Corridor
test driving experiences

FROM COAST TO BORDER

Jari Hietaranta
Turku University of Applied Science, Department of RDI & Baltic Loop -project

In Baltic Loop -subproject dealt with test driving of there test groups. The study is based on own observations of test groups and interviews of truck drivers along the gateway between west coast ports and Vaalimaa border crossing. Aim was to find out the real bottlenecks and fluent sectors and points from drivers `point of view. There are lot of variations in opinions. Twenty-eight noticeable bottlenecks were observed by test groups. These bottlenecks effect the fluency of traffic and cause lot of emissions originated from slow and noneffluent traffic.

Jari Hietaranta, Turku University of Applied Science, Department of RDI. Joukahaisenkatu 3 FIN-20230 Turku Finland.

Contents

1. Purpose of the study

This report is part of the Baltic Loop project. The aim was to experimentally investigate the problem areas of traffic on the E-18 (Northern Corridor) by driving from the ports of Turku and Naantali to the Russian cross border checking in Vaalimaa. The aim was to make observations on transport infrastructure, traffic flow and safety. In addition, the aim was to interview drivers' perceptions of services and their shortcomings and development wishes during the trip.

This subproject complements the discussions with other stakeholders carried out during the Baltic Loop project. Empirical field research complements the previous theoretical baseline data report (Heikkinen 2020) on traffic volumes and potential bottlenecks on the fairway. In order to enable detailed reviews and analyses, the route was divided into 13 sub-areas (segment, *see* below) in Heikkinen's (2020) report.

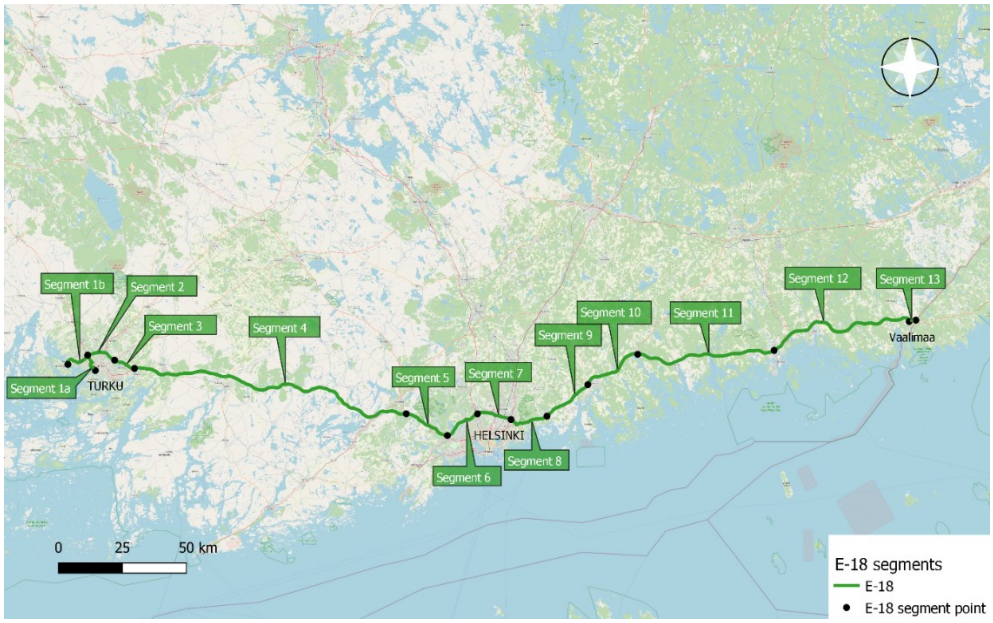
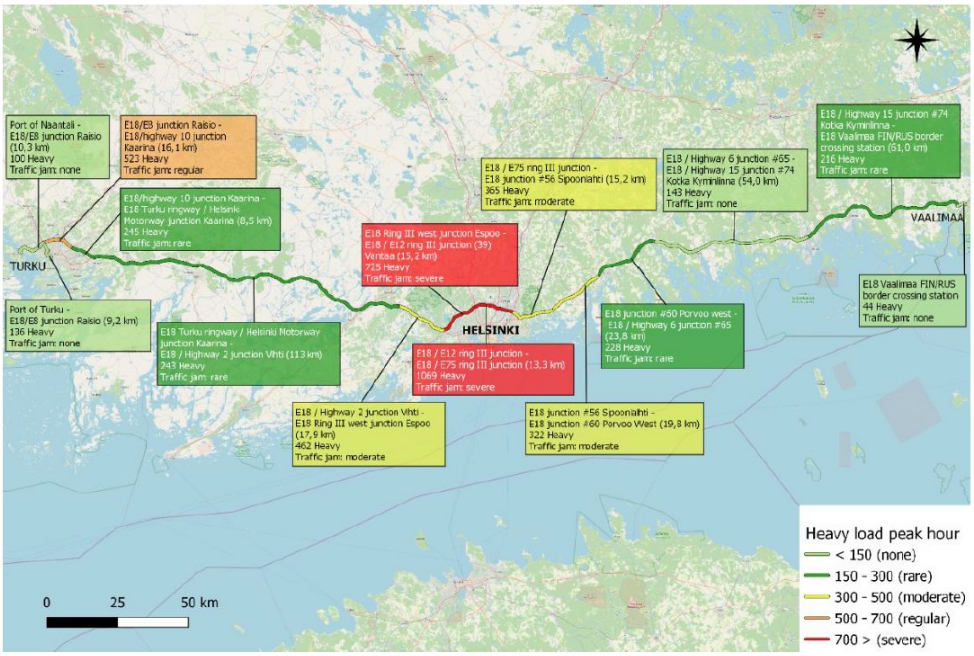
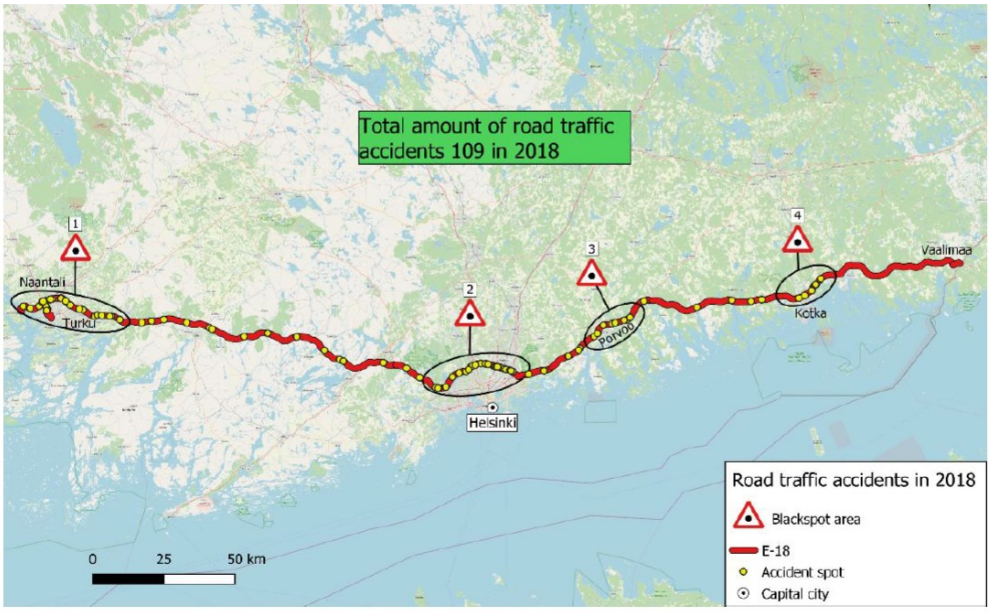


Fig 1. European route E18 (corridor 1) in Finland on the route Port of Turku / Port of Naantali (FIN) – Helsinki (FIN) – Vaalimaa border crossing segments in Finland visualised in a map.





Figs 2ab. *Up*: Heavy vehicle intensity by peak hour traffic. *Below*: Road traffic accidents along the E-18 (*Source*: Ylitalo 2021).

The total distance from Turku to Vaalimaa border crossing is approximately 777,3 km. In the earlier stages of the project (Hallvar et al. 2020, the structure and bottlenecks of the route and terminals have been examined based on existing data (Hallvar *et al*. 2020) and the service offering of rest areas (Yliluoto 2020), the current location of freight terminals (Yliluoto 2020) and their potential new locations and traffic volumes in different parts of the fairway (Hallvar 2021).

The test run includes visits to terminals and resting places The journey sought to simulate a genuine situation in all respects; the route entered visits to resting places and cargo terminals, as well as estimates of the functioning of ports and border crossing points from the point of view of freight carriers.

All three experimental pilot journeys started the port of Naantali or Turku and returned to the same place the next day. The test groups were logistics students. There were three groups and each group drove back and forth from the ports of Turku or Naantali to the Vaalimaa border crossing and back. Each test group

consist of 3-4 student. Test groups used Scania's four-seater 2-axle towing vehicle, combined with a semi-trailer, The weight in the combination were around 6,000 kilograms. The truck is typical one at the corridor. There were three test runs from Turku and Naantali ports to Vaalimaa border crossing and return. One of the main objectives in the project is to define current state, objects to be improved and suggestions to development within traffic infrastructure, highway and junction capacity, travel time as well as its predictability and reliability, intelligent traffic solutions, traffic safety level and heavy cargo transport-oriented services on the corridors.

In addition to driving throughout the route, truck drivers were interviewed at resting areas using Gallup-type method. The questions presented were dealing with the experiences about the resting area quality and port procedures as well.

Figs 3ab. *On the Left*: Trucks queuing to ferry. *On the right*: temporally road construction work at Turku Ring Road.

Hypothesis for the research can be stated; 1) there are unseen or unrecognizable delays or bottlenecks along the E-18 gateway (from ports to Vaalimaa border crossing), 2) The effect of delays can be summarized as saving in gas consumption and as possibility to save cargo transport time and gas emissions as well. In addition, when considered the time saving and improvements of cargo handling at cargo terminals.

2. Methods and data collection

Test journeys were documented by 1) measuring driving time in each segment *(see* Ylitalo 2021), 2) by taking notes on your own observations on to computer problems and smooth driving cycles, and 3) the journey was filmed with a Dashcam-type GoPro camera. The observations made by the groups were supplemented by interviews conducted at break points. During the test journey it was documented 1) driving time in different segments *(see* Ylitalo 2021), 2) by taking notes on your own observations on to computer problems and smooth driving cycles, and 3) the journey was filmed with a Dashcam-type GoPro® camera. The observations made by the groups were supplemented by interviews conducted at break points.

This report forms the summary of tree test groups. Report consists of three parts; first it represents the own observations of the segments and highlights the causes of delays and problems.

Secondly, the report represents the test group own concepts about the road services available at gas stations for truck drivers, parking area quality and accessibility from E-18. Thirdly, at resting areas short interviews

were proceeded. There were 26 interviews with the truck drivers. For practical reasons Only Finnish speaking drivers were interviewed. Drivers were stayed at 12 different resting parks; so, there are some interviews being made at the same testing park. Gallup -type questions were prepared in advance. First three questions were structured and after them the interviewed person was asked for free comments. We used relative scale from poor, fair, Ok, good and excellent (1 to 5).

The questions asked from drivers were concerning the whole port procedures:

1. accessibility from E-18 (1 to 5, poor to excellent)
2. queuing in port to check in (1 to 5)
3. queuing for loading a ship (1 to 5)
4. smooth loading (1 to 5)
5. smooth dismantling of the ship (1 to 5)
6. exit from port (1 to 5)

There were 13 resting areas studied during the field trips. Most of them are gas stations (nine altogether) and services they are providing for truck drivers is not the main target in their business. Vaalimaa cross point truck park area is planned especially for trucks. Three resting area studied here are proving food and sanitation services but no gas.

In addition, the ports and cargo terminals along the E-18 were observed during the test driving by test group members. There were six different cargo terminals that were studied. The focus was to evaluate the accessibility and layout of terminal yards. Ports were observed at the same way; what are the main problems linking to arrival or departure to port. Three ports were observed. Port operations are studied in more detail at separate report (*see* separate report). Vaalimaa – cross border area was studied separately.

3. Results

Test driving of 377 kms was driven (one way distance) three times. In the flowing chapter the test group driving experiences are presented segment based. There are also comments represented by the test groups.

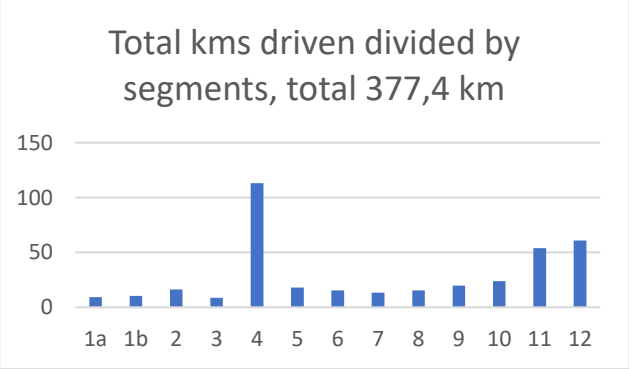


Fig 4. Total amount of kms driven by test groups and divided by segments.

3.1 Test driving along the gateway

Test groups were driving three times the corridor to Vaalimaa border cross and back. The idea was to repeat the actual journey from Turku and Naantali ports to border and back contain resting periods and terminal

visits as well. The opinions presented by of all five groups highlights the opinion of cargo truck drivers in general way. In the following chapters the observation of test groups is collected (from 3.1.1 to 3.1.13).

3.1.1 Segment 1a: Port of Turku – E18/E8 junction Raisio (9,2 km).

The first 6 km of E18 traffic infrastructure from Port of Turku are urban streets. Majorly 2 lanes per direction, traffic signals. The last 3 km to the end of segment 1a is motorway, 2 lanes per direction. The segment is vulnerable to congestion and interference. According to the Traffic management system (2020) there are regular daily traffic congestion (delays 10 to 15 min) in three sections: 1) Streets close to Port of Turku Truck check-in and exit (around RO-PAX ferry departures and arrivals).

Table 1a. Test driving of segment 1a.

distance (km)	9,2 km
average driving time (N=2)	13,25 min
smoothness of traffic (1 to 5)	4
traffic signs and safety (1 to 5)	4

comments: "*There are lot of different kind of delays coming out from temporal road and urban construction work and normal urban delays like traffic lights. It took lot of time to reach E-18. Complicated driving especially at the rush times.*

3.1.2 Segment 1b: Port of Naantali – E18 / E8 junction Raisio (10,3 km).

Throughout segment 1b, major sections are urban streets and suburban roads, 1 to 2 lanes per directions. There are no interchange junctions on the segment, all the junctions are intersections with traffic signals or "yield" traffic signs. (National Land Survey of Finland 2020.)

Baseline data from existing statistics suggest that the segment is vulnerable to congestion and interference. All the traffic congestion is common Mon-Fri 7:30 to 9:00 and 15:30 to 17:00, with total delays of 10 to 15 mins. E18 / Road 185 intersection with "yield" traffic sign. E18 Raisio Town center, several traffic signals, insufficient traffic capacity of street. Junction E8 / E18 in Raisio (traffic signals, motorway exit traffic merging to urban traffic). (Traffic Management Finland 2020.)

*Table 1.*2 Test driving of segment 1b.

distance (km)	10,3 km
average driving time (N=2)	13,0 min
smoothness of traffic (1 to 5)	4
traffic signs and safety (1 to 5)	4

comments: *"Halfway through the segment, the speed varied by about ±.5 km/h due to the hose of several heavy vehicles. Most of the heavy traffic were removed from the traffic in the plow valley in the direction of 10 road. Lane 4 mixed traffic, shared with oncoming railings. Easy to join the Turku Ring Road from Raisio junction".*

3.1.3 Segment 2

Table 1.3 Test driving of segment 2.

distance (km)	16,1 km
average driving time (N=2)	9,41 min
smoothness of traffic (1 to 5)	5
traffic signs and safety	4

comments: *“"Towards the end of the segment, the roundabouts caused a rubber band effect when there were many heavy vehicles in a row. The construction sites had narrowed the lanes at some points."*

3.1.4 Segment 3: between E18 / highway 10 exit Auranlaakso Kaarina – E18 Turku bypass / Helsinki motorway highway 1 exit (8.5 km).

Table 1.4 Test driving of segment 3.

distance (km)	8,5 km
average driving time (N=1)	7,58 min
smoothness of traffic (1 to 5)	4
traffic signs and safety (1 to 5)	4

comments: *“When joining the road from bypass 1, the acceleration lane was really short, which is even too short for a passenger car. Traffic very smooth, reprotance got throughout the segment. Traffic lights and signs for the most part digital, which show, for example, the lock of the second lane of the tunnels or the construction area ahead that we did not have. Road 4 lane mixed traffic quite a lot”.*

3.1.5 Segment 4: E18 Turku bypass / Helsinki motorway highway 1 exit – E18 / highway 2 exit Vihti Palojärvi (113.0 km).

Table 1.5. Test driving of segment 4.

distance (km)	113,0 km
average driving time (N=1)	80,23 min
smoothness of traffic (1 to 5)	5
traffic signs and safety (1 to 5)	4

comment:s "*After Ykköspesä Ltd, bridge work begins on the E18 road and becomes single lane, speed drops to 60 km/h momentarily and then continues up to 80 km/h".*

3.1.6 Segment 5: E18 Highway 1 / Ring III exit Espoo - E18 / Highway 2 exit Vihti Palojärvi (17.9 km)

Table 1.6. Test driving of segment 5.

distance (km)	17,9 km
average driving time (N=1)	11,28 min
smoothness of traffic (1 to 5)	5
traffic signs and safety (1 to 5)	5

comments*: "Digital speed limit signs, lively but smooth traffic were found on the road section, but it did not affect our speed”. “Traffic signs appear to be clear, traffic smooth, old-fashioned snippet and lots of bends.*

3.1.7 Segment 6: Kehä III liittymä Espoo – E18 / E12 (valtatie 3 Tampere) liittymä #39 Kehä III (15,2 km).

Tentatively the section 6 is intense with traffic and lot of road accidents, but driving was quite fluent during the test driving. There are lot of cargo terminals within this sector and 5 and 7 as well. The driving is slightly slower than baseline data was suggesting.

Table 1.7. Test driving of segment 6.

distance (km)	15,1 km
average driving time (N=1)	10,42 min
smoothness of traffic (1 to 5)	5
traffic signs and safety (1 to 5)	5

comments: *"In the beginning, a three-lane motorway, transformed into a two-lane road". "Good and clear road with fluent traffic, clear road signs."*

3.1.8. Segment 7: **E18 / E12 (Highway 3 Tampere) junction #39 Ring III – E18 / E75 (Highway 4 Lahti) junction Ring III (13.3 km).**

The most intensive traffic amount along the E-18. A bit surprisingly the driving was quite fluent at this section. Temporally delays exit, however. Highway 3 is one most important route from capital area to the north.

Table 1.8. Test driving of segment 7.

distance (km)	13,3 km
average driving time (N=1)	10,50 min
smoothness of traffic (1 to 5)	5
traffic signs and safety (1 to 5)	5

comments: "*A little more traffic, no traffic jams. Lots of interfaces, clear road signs and signage. A bit of roadworks but does not have a significant impact on traffic". Part three-lane road, third bus lane. Very smooth traffic and well-maintained roads."*

3.1.9 Segment 8: Section 8: E18 / E75 (Highway 4 Lahti) junction Ring III - E18 (Highway 7) junction #56 Sipoonlahti (15.2 km).

Still one of the liveliest sections of traffic. Section contains the junction E-18 and highway 4. The latter one id the most important highway from capitol area to the north.

Table 1.9. Test driving of segment 8.

distance (km)	15,2 km
average driving time average (N=1)	10,51 min
smoothness of traffic (1 to 5)	5
traffic signs and safety (1 to 5)	5

comments: *"Newest section of Ring Road III, three-lane motor transport road. Traffic is doing well."*

3.1.10 Segment 9: Section between the #56 Sipoonlahti and #60 Porvoo (12.8 kms).

In general traffic is very sparse. Clear road signs and two wide lanes, automatic speed control and no major junctions.

Table 1.10. Test driving of segment 9.

distance (km)	19,8 km
average driving time (N=1)	10,16 min
smoothness of traffic (1 to 5)	5
traffic signs and safety (1 to 5)	5

comments: *"Clear road section, good road signs. The condition of the road is good. Fluent traffic."*

3.1.11 Section 10: Segment starts E18 exit 60, which takes you to Porvoo. and ends at the Koskenkylä junction, where highway 6 meets E18. The distance is 23.8 km long.

Table 1.11. Test driving of segment 10.

distance (km)	23,8 km
average driving time (N=1)	18,30 min
smoothness of traffic (1 to 5)	5
traffic signs and safety (1 to 5)	5

comments: *"There was some commuter traffic near Porvoo, but towards the end of the segment there was almost no other traffic near the Koskenkylä junction. Our speed remained at 80 km/h and there were no incidents on the way to which we should have reacted, e.g. in the case of 100 km/h. slowing down or braking. The fairway was good for the 100th motorway, although basic improvements should be made."*

3.1.12: Segment 11, from Koskenkylä junction (#65) to the junction #74, where Highway 15 meets E18. Segment is 54.0 km long.

Table 1.12. Test driving of segment 11.

distance (km)	54,0 km
average driving time (N=1)	50,00 min
smoothness of traffic (1 to 5)	5
traffic signs and safety (1 to 5)	5

comments: *"Traffic during the period very little, road condition ok, but road coating worn out."*

3.1.13 Segment 12: Between Kyminlinna exit in Kotka, exit 74, and the end of E18, i.e. to the Vaalimaa border cross station. Segment length is 61.0 km.

Based on baseline statistic the section was pre-evaluated to be quite fluent without any special problems linked with driving.

Table 1.13. Test driving of segment 12.

distance (km)	61,0 km
average driving time (N=1)	56,30 min
smoothness of traffic (1 to 5)	5
traffic signs and safety (1 to 5)	5

comments: *"Traffic flow very good due to the low volume of traffic. In some places, the pavement would require re-healing, but the violation of the road coating does not pose a danger. Road markings good."*

3.2 Fast and slow sectors

Figure 5 (*below)* represent relative share of time and kms divided by segments. The driving time at segments 1,2 and 3 is slower that should be expected and on the other hand driving is faster at the segments from seven to the border cross. In can be stated that the delays and bottlenecks do not be too remarkable. It can also noticed from the observations made by the test driving groups and intrviewed drivers as well. Segments two and three are located at Turku Ring Raod and there are bottlenecs reported due to temporal road improvements and construction of new road. The construction work will continue for next 2-3 years. Segments four to eight are located at the capital area Ring Road III (segment eight partly only) and driving is sligtly slower that it should be, The rest of segments from eight to twelve are to the east from capital area and driving is sligtly fasten than espected.

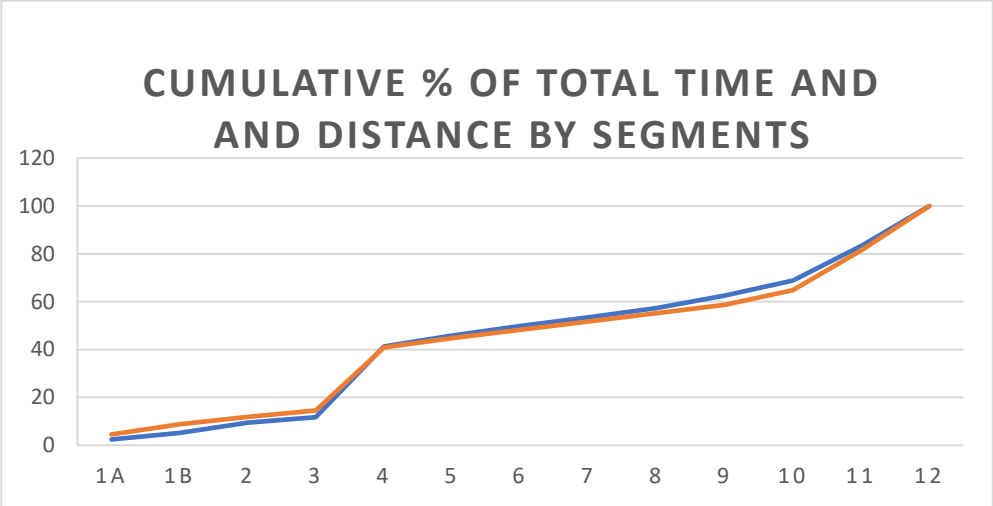
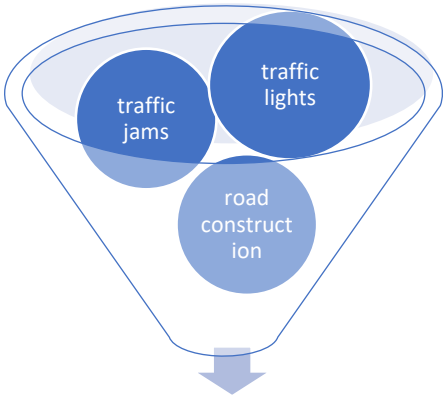


Fig 5. The cumulative % of time and distance by segments. Blue line= cumulative % of distance Red line= cumulative % of time.

However, it has to be noted, that during the fest driving phases that traffic in general was quite reasonable with intensity. At the capital area (segments of Ring Road III) during more normal circumtances the driving should be more slower than the testing was succesting.

As shown by the Baltic Loop project calculations (Yliluoto 2021) the bottlenecs of driving can be divided into there distinctive categories. The time needed for visiting rest areas or terminal are excluded.



resulting in travelling time loss-increase in gas consumption-increase in emissions

Fig 6. Main three time loss categories. They increase the gas consumption of heavy truck traffic at E-18.

Twenty-eight separate bottlenecs between ports and Vaalimaa border cross were identified altogether (Yliluoto 2021). The influence for gasoline consuption and time delay is shown on table below.

3.3 Accessibility to cargo terminals

There were six (6) cargo terminal being visited during the journey The time that took from E-18 to reach the terminal gate was measured. In addition, road infrastructure and road signs of terminal location was observed. Some general observation about the terminal yard layout was made too.

Time consumptions return drive to terminal was 11 min 17 sec as an average with time variations from 8 min 15 sec to 16 min 20 sec respectively.

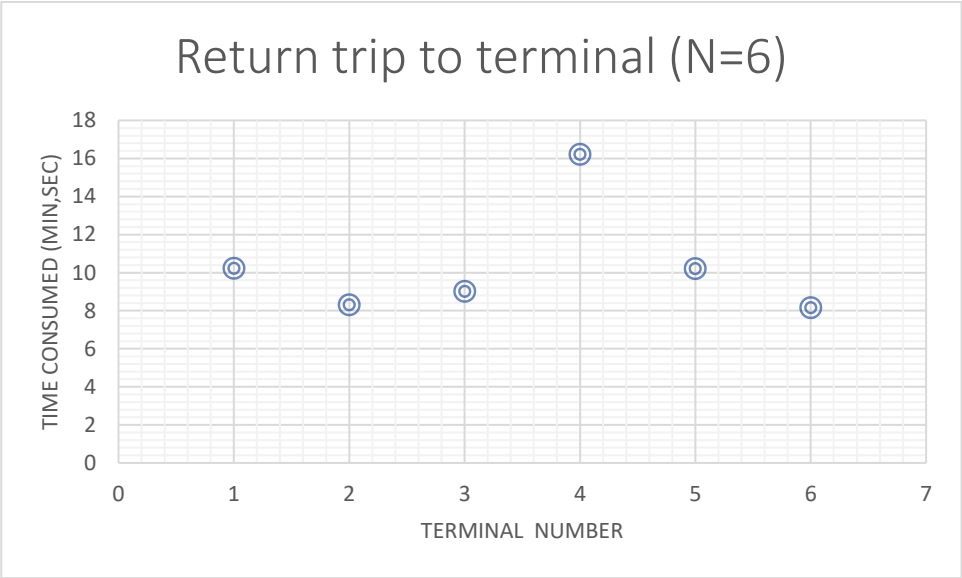


Fig.7. Driving time usage from E-18 to cargo terminals.

In general, the accessibility to terminals were quite good. The traffic flow was quite fluent despite traffic lights and absence of turning lines. There were two terminals of poor or insufficient guidance for trucks.

It can be stated too that the terminal yards were well planned and organized. In the case of two cargo yards the shape and size of yards would be too small for long vehicles especially at rush times. Below is some observations and statements made by test groups. They are not listed any specific order.

"Easy to reach even with long vehicle but trip quite long time even outside rush times. Terminal looked well organized and large enough for every kind of vehicles."

"There seems to be enough space for HCT too" Easy to reach from E-18."

"Yard is too small for HCT." and terminal is mainly meant for local distribution and smaller vehicles."

"Well guided route to terminal from E-18. and inside terminal too. Lot of traffic in and out, but everything seems to work well. Lot of space."

"Leaving E-18 is easy and well guided to terminal yard. Two traffic lines on the route. Terminal looked a bit old fashioned and tight for long vehicles. Inside terminal yard guidance was not-so-clear and may cause problems to newcomer."

3.4 Port accessibility

The port traffic and accessibility were observed at port of Turku only. At the morning, there were two passenger trains arrival at the same time as ferries from Sweden are unloading vehicles and new ones are coming. It took around 43 minutes to unload the trucks and trailers from one ferry. Altogether, there were around 62 trucks that were unloaded.

There were around 72 trucks coming to the port and all traffic was stopped twice because of trains. Traffic is lively too especially at the morning side. Beyond the port gates the driving to the E-18 (Helsinki direction) was easy and well guided route.

There are numerous traffic lights and driving is slow and will take remarkable time. In addition, there are ongoing and more coming out at the near future road repairing and construction works. It took around 45 minutes

At the evening the incoming traffic was fluent without any special delays in flow. There were around 60 truck arriving the port. Port operations and possible bottlenecks and causes of delays are also in discussed in detail in the report (*see* fig 8ab).

Fig. 8ab. On the left Queuing to ferry. Waiting areas are large. *On the right* the route to Turku port was seen quite time consuming because of traffic and numerous traffic lights.

3.5 Cargo shipping procedure

There are port operations of three shipping companies operating Turku and Naantali ports. The port operations were studied by three student groups. By comparison to some other ports in Europe were also made. It clear that the reservations and cancellations are familiar process to those companies' operation regularly base between Finland and Sweden but for those who are not operating on regular base the process needs lot of attention. The cargo shipping procedure examples are shown below.

Shipping company 1

Trailers have s to be at port 1h 30 min before ship leave and trucks driving into ferry by itself they have to be at port 1h 00 min before ship leaving. Those trucks having valid reservation to ferry can lose their ferry place if check-in is missed the deadline. The place is given to those one at waiting list. The cargo transport fees has to be paid at the transport day at its latest. If the reservation of ferry place is not cancelled at least 1 hour before ship leaving time. If ship is delayed the shipping company will compensate the cost coming out from delay if not the cause of delay is because of severe weather conditions.

If ship must wait cargo, the shipping company can charge about the waiting time. The cost is reasonable high. If the pre- announced dimensions of truck (height, weight, length, and content) are not right with actual figures, the truck cannot enter the ship and must wait next journey.

Shipping company 2

In freight traffic, the driver must carry the registration number or, if applicable, the booking number of the unit to be checked, as well as a valid id card (passport, driving license, ID card), against which the driver receives a ship ticket and a cabin card.

Check-in for arriving freight starts about 90–120 minutes before the ship depart and the cargo unit should be present at loading area 60–90 min before leaving the port. Later arrival at the port is possible, but the forwarding company must contact shipping company by phone or email.

Any ADR or electricity-demanding loads may require a specific location on board, so their arrival time may be tighter than that of normal units. Various over-the-top or other special transports must also be on the shore well to guarantee these units a place on board.

Therefore, if the unit does not appear on shore at least one hour earlier, the unit may be removed from the departure and replaced by a unit from the waiting list. For an unused trip when the unit does not show up at the port, it may result in the unit's forwarding company receiving a 'no show' invoice for unused place on board.

In the following the description of loading/unloading process of cargo based on observations at two ports. The following table shows the information of size and type of arrival and departure as well as the loading of cargo to the ship.

Table 4. Example about the cargo type at route arriving from Stockholm to Turku.

type and size	amount
module 10,0–12,0 m	1
module 16,5–17,0 m	36
module 19,0–22,0 m	1
module 24,0–25,5 m	18
trailer 14 m	7

There were 75 units altogether, total lenght: 1199,5 m, total weight: 1844,9 t, number of ADR-units: 7. No need for electric connection or special transportation.

Table 5 Example about the cargo type and size departing from Turku to Stockholm.

type and size	amount
module 10,0 – 12,0 m	3
module 16,5 – 17,0 m	26
module 19,0 – 22,0 m	6
module 24,0 – 25,5 m	15
trailer 14 m	15

There were 65 modules altogether with total length 1186,1 m and weight 2205,7 t, 2 ADR-units and 8 module that need electric connection and no special cargo on board.

3.5.1. Cargo loading phase

The task was to calculate the queue length by vehicle type at the check-in gate and after the check-in, to monitor the loading of vehicles on board using vehicle type, number, and time meters, and also to unload the ship, monitoring the time taken for the demolition, the number of vehicles and the order in which they were driven.

In total, 26 vehicles, 8 full trailers and 18 semi-trailers went on board. In addition to the vehicles, 17 loose cars were loaded into the ship, which were ready inside the gate. It was challenging to visually examine the length of the queue at the gates of the check-in, but the queue was about 150-200 meters long when viewed visually at the gates. Not everyone loaded onto the ship was in line yet when the check-in gate was closed, there were more later after the gate opened.

The vehicles entered the queues as follows when the gate opened: semi-trailers, full trailers - wagons in need of electricity - and tanker trucks in their own queues by vehicle type. The first thing loaded was a loose carriage, which was driven in by craders. It took the most time to load the loose wagons. After the loose cars, the cars went a little bit, however they happened, it was difficult to observe next to the check-in gate how the cars were placed on board, the more likely it was in some sort of weight order. The total time spent loading according to stopwatch (1) hour and 2 minutes.

Figs.9ab. Typical scenery of queuing trucks. According to the study, it took around one hour to load the trucks into ferry.

3.5.2 Cargo unloading phase

Thirty-two vehicles and eight detached cars came from the ship towards Turku. Of the vehicles, 3 were "basic trucks" (one-part), one of them with a bun basket. The remaining vehicle combinations, twenty semi-trailers and nine full trailers. The demolition of the ship began similarly to be loading, the first to have loose cars out by the craders. After this, vehicles came out of the ship at random again by different types. When the ship's gates opened, a stopwatch was put running, and the ship was empty when the clock struck for 16.5 minutes (16min 30 sec).

4. Drivers' opinions

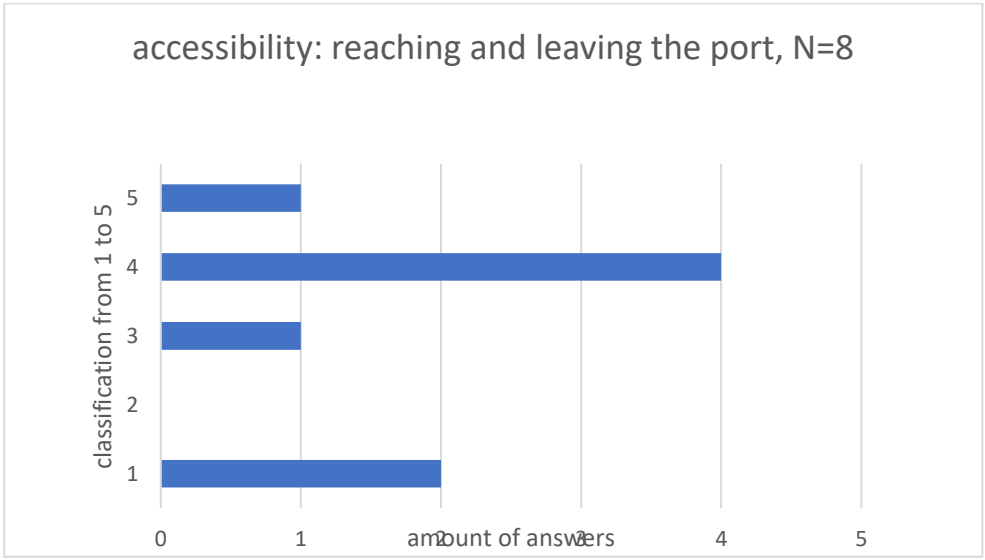
Altogether there were eight interviews of truck drivers concerning the port operations as well as some opinions about the port accessibility and information provided to truck drivers. All the interviews took place at resting areas near Turku.

Figs. 10ab. *On the left*: Truck parking at ABC Raisio gas station. *On the right*: Night at Seamen`s Missionary Church truck park. Turku port lights seen on the background.

4.1. Inside and near port

The drivers had been driving between 6 and 10 hours when interviews started. The trucks they were driving were variable in length and cargo was variable. All the interviewed eight drivers were Finns as their nationality. Interviews with the non- Finnish speaking drivers was not successful. Mainly they were not willing to answer at all or they weren't able to speak Finnish to answer questions. The questions were dealing driving in port or out from port, cargo handling procedure and

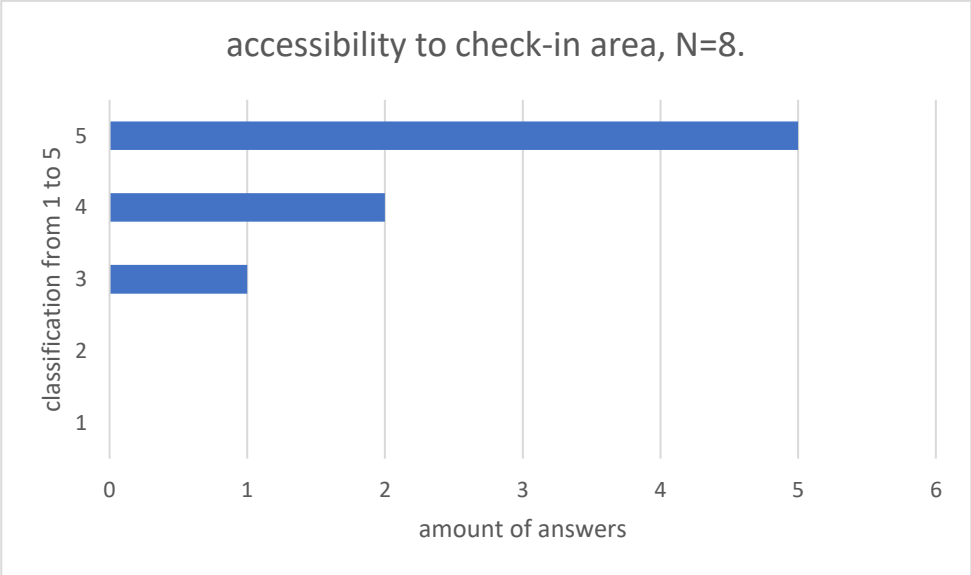
Table 6. Reaching and leaving of port area. 1= difficult and slow driving… 5= easy and fluent driving.



The answers dealing with the accessibility to port (and away) from / to E-18 (northern corridor) was recognized as easy or relatively easy (5 answers) and two drivers consider accessibility to northern corridor

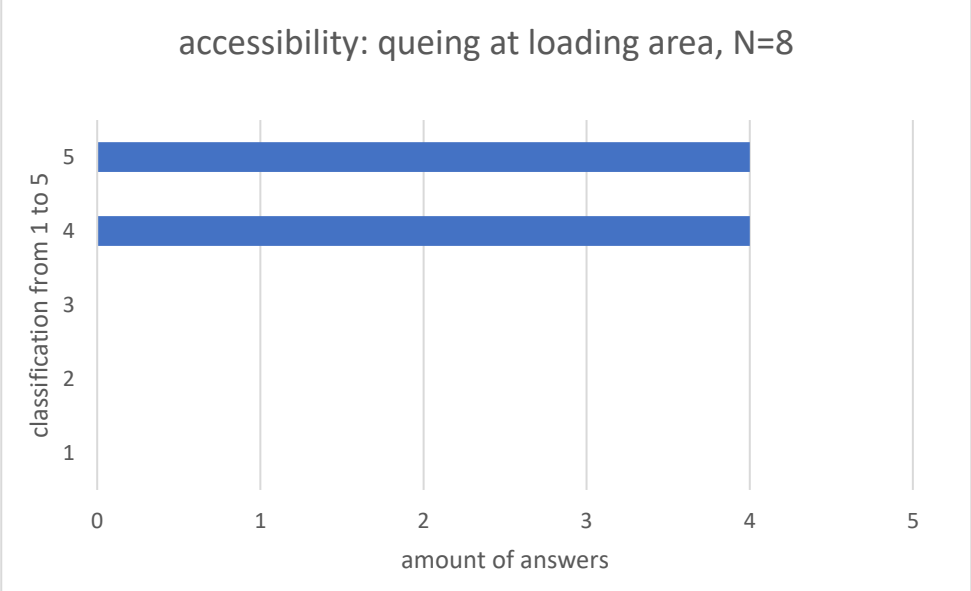
slow and difficult. The main reason for negative replies was road construction on the route. In addition, the big amount of traffic lights making the driving difficult. As pointed by Baltic Loop survey the journey on that segment will took almost half an hour.

*Table 7***.** Queuing to port check-in point. 1= crowded, poor space… 5= clear and enough space.



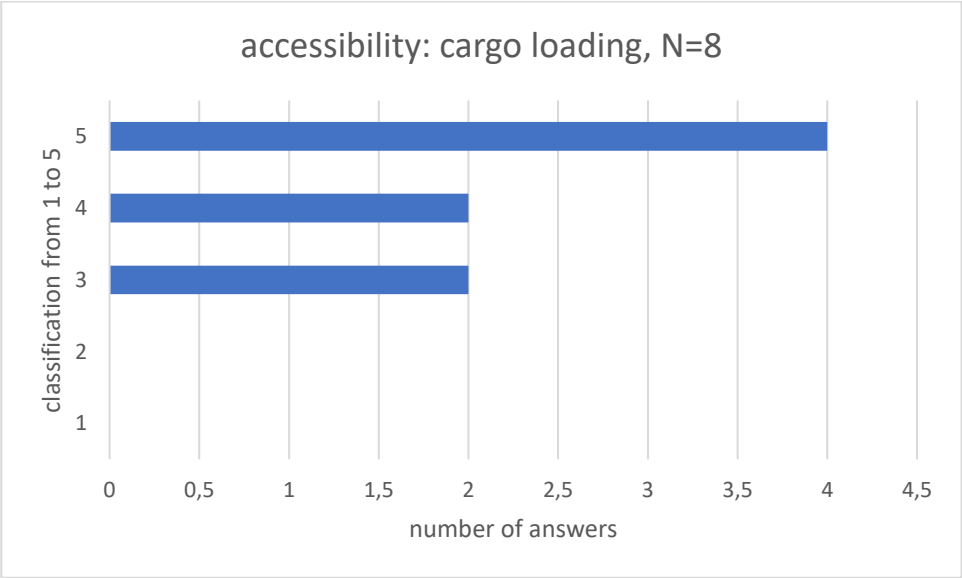
Practically all drivers interviewed in this survey were satisfied with the accessibility to check-in area.

Table 8. Queuing at loading area. 1=very bad… 5=very good.



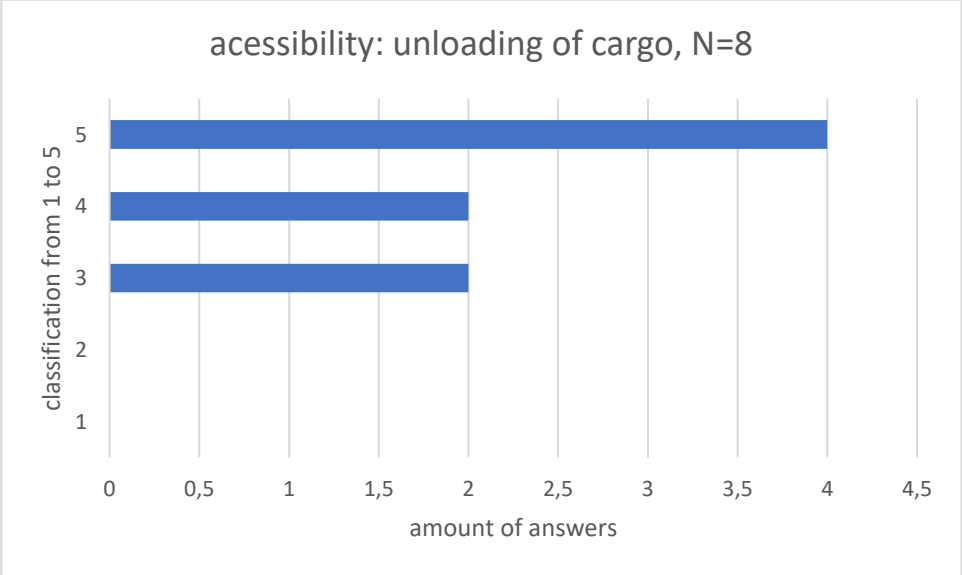
The satisfaction among drivers to enter and waiting at loading area owned no problems. All the nominations were either four or five.

Table 9, Cargo loading procedure. 1= very bad… 5=very good.



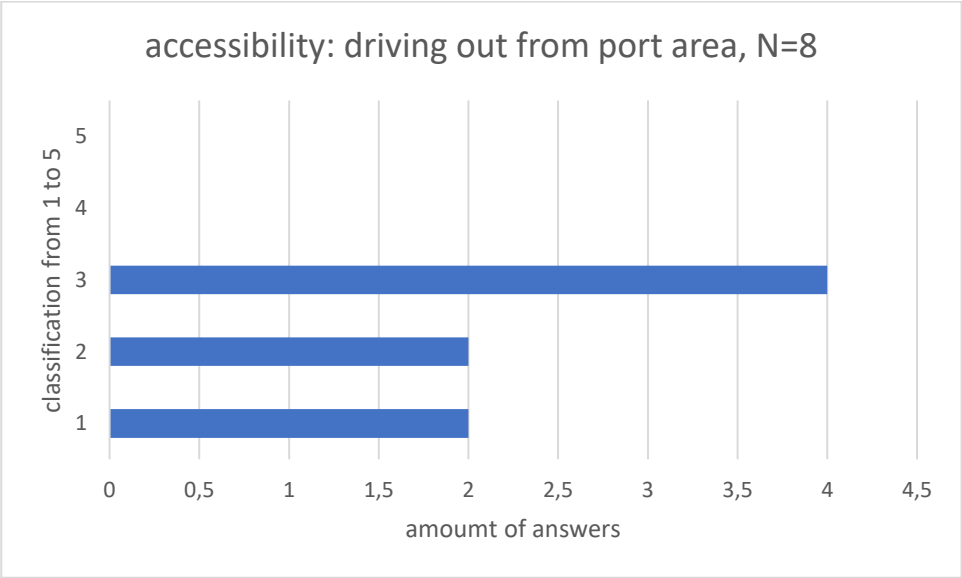
The satisfaction of loading of trucks into ferry is recognized good or very good. No negative feedback was given. All the nominations were between three and five respectively. When asked about the unloading the results were similar compared to loading process (*see* table below).

Table 10. Cargo unloading procedure. 1= very bad…5=very good.



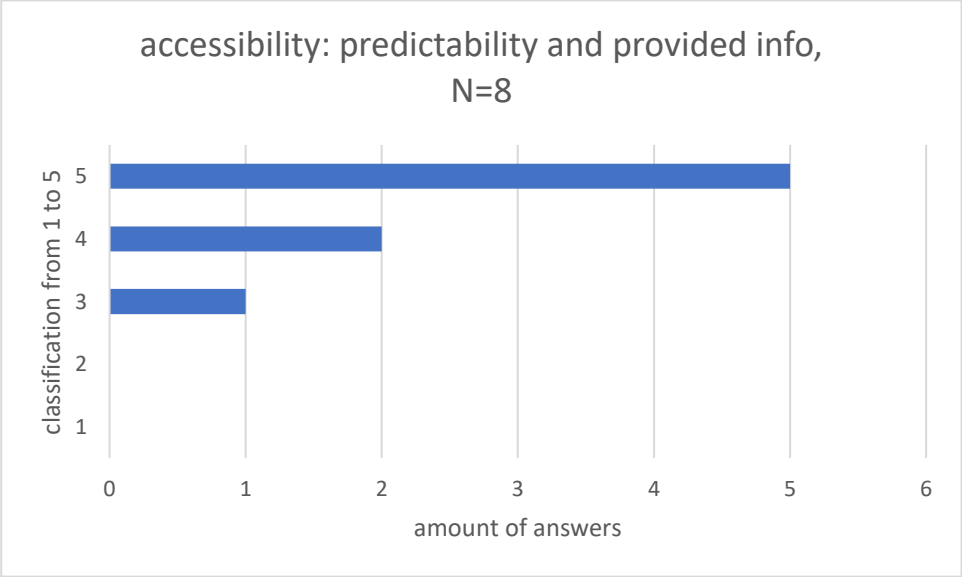
The survey also asked about the outdriving from port. In this case the drivers saw more problems compared with the in driving.

Table 11. Port outdriving. 1= very poor…5=excellent.



The most negative opinions were received in this question referring the driving after unloading to port gate. Reason for negative feedback was based on mainly on two reasons; Firstly, the train coming and going causes remarkable delays. Secondly, the other traffic and pedestrians at port area make driving slow and even dangerous.

Table 12. Predictability and information provided to drivers. 1= bad … 5= excellent.



Four out of eight drives interviewed here were very satisfied information provided to passenger at port area and only one out of eight was quite neutral.

Although, the interviews of truck drivers were only tentative and is based quite limited number of answers only test three driving procedures, However, it is quite clear, that there should be possibilities to speed up cooperation between shipping companies and transport companies. That would result as declined costs and time savings as well. The shipping procedures lack behind in Finland compared to ones elsewhere in northern Europe. In general, the segments along the corridor are relatively good condition. Outdriving from Turku port was kept much more problematic compared to in driving.

5. Discussion

It came out that the reservation and check in processes are more fluent and more straight forwarded elsewhere in Europe. The *www* pages of shipping companies operating between Finland and Sweden studied here were provided without prober information about procedures and phone operated customer service gave only unsatisfactory answers. Reservation procedure at some Swedish or Danish ports seemed to be much more fluent and fast compared to Finland. There are for instance possibility to proceed reservations and check-in via internet without any human contact.

The main problems with the terminal and its surrounding area are traffic arrangements when arriving at the terminal, roadworks in the port area and a railway line along which people from and on board slow down and make it difficult to get to the terminal. It is also difficult to travel because only one route can be driven to the Port of Turku with heavy equipment, as it is prohibited to drive heavy vehicles (more than 15 m) in the center of Turku. Once they get to the terminal, the cars will be able to reach the port area relatively quickly to wait for the ship to board. The biggest bottleneck in the loading and unloading of a ship in time is the loading and unloading of trailers. However, it should be noted that the interviews of truck drivers were relatively few and were only focused on Finnish drivers. On the other hand, the surveys didn't reveal any possible bottlenecks or problems associated with wintertime driving.

Based on our own observations and very unified feedback from the drivers, Viking Line Ltd 's port of Turku loading is very smooth once the vehicles have arrived in the loading area. However, the length of the "waiting list" band received some feedback on its small size. Roadworks in the port area, on the other hand, cause congestion both when entering and leaving the port. Cars leave the ship in line, especially for drivers, who are no stranger to the port area, and the port area cannot face major challenges in finding a way out of the area and onwards to larger roads in general. However, the problem is temporary and should be eliminated when the roadworks is completed. This will very likely make it easier to enter and leave the port in the future.

Driving along the corridor was experienced to be quite fluent and the accessibility to cargo terminals along the gateways was seen reasonable.

Literature

Hallvar, A. & Heikkinen, H. (2021). Optimized locations of logistic centers. *Unpublished project report*. Baltic Loop - project, 22 pp.

Hallvar, A., Heikkinen, H., Hietaranta, J. & Lindström, K. (2020). The current terminal network of the transport corridor Turku – Vaalimaa border crossing. *Unpublished project report*. Baltic Loop project, 23pp.

Transport Management Finland. https://www.fintraffic.fi/fi/fintraffic/digitraffic-ja-avoin-data. Viitattu 14.9 2021.

Ylitalo, P. (2021). Report of visualizations. *Unpublished project report*. Baltic Loop-project, 122 pp.