

Helsinki and Tallinn on the move



Cover photo: Modern Talking (Estonia)
Design: Innocorp Oy
Printers: Lönnerberg Painot Oy, 2012
ISBN 978-952-272-364-2

Helsinki and Tallinn on the move

Final report of H-TTransplan project

Ulla Tapaninen (ed.)



Tallinn - Helsinki 2012

Contents

1.	Introduction.....	5
1.1	Background	5
1.2	Structure of the report	6
1.3	Acknowledgement	7
	PASSENGER STUDIES.....	9
2.	Passengers travelling between Helsinki and Tallinn.....	10
2.1	Background and aim of the study.....	10
2.2	Methodology of the study.....	11
2.3	Results	11
2.4	Conclusions	15
3.	Air passenger survey	16
3.1	Aim and methodology of study	16
3.2	Tallinn Airport traffic data and passenger surveys 2004-2011	16
3.3	Why people travel by air between Tallinn and Helsinki	18
3.4	Use of transport services and need for information.....	19
3.5	Trends in travel.....	19
3.6	Conclusions	20
4.	Spatial Mobility between Tallinn and Helsinki in Mobile Positioning Datasets	21
4.1	Aim and methodology of the study	21
4.2	Estonians in Finland.....	23
4.3	Finns in Estonia.....	25
4.4	Conclusions	27
5.	Study of foreign visitors in tourism events in Tallinn	29
5.1	Aim and methodology of the study	29
5.2	Main results.....	30
	CARGO STUDIES.....	35
6.	Cargo flow study on the Helsinki-Tallinn route.....	36
6.1	Aim and methodology of the study	36
6.2	Results of the statistical analysis	37
6.3	Results of the interview study.....	40
6.4	Conclusions	41
7.	Vehicles carrying cargo in ports of Helsinki and Tallinn	44
7.1	Aim and methodology of the study	44
7.2	Results of the interviews	45
7.3	Conclusions	48
8.	CO ₂ Analysis of Helsinki-Tallinn Transportation Chains.....	49
8.1	Aim and methodology of the study	49
8.2	Results: analyzing all possible combinations with most probable utilization level	51
8.3	Conclusions	58
	ECONOMIC STUDIES.....	61
9.	The effect of business on mobility between Helsinki and Tallinn	62

9.1	Aim and methodology of the study	62
9.2	Results of the statistical analysis	63
9.3	Results of the interview study	65
9.4	Summary	66
10.	Economic flows between Helsinki and Tallinn regions.....	68
10.1	Introduction	68
10.2	Cross-border regions in research literature.....	69
10.3	Framework of cross-border regional economic flows.....	72
10.4	Estimations of cross-border regional economic flows between Tallinn region and Helsinki region.....	73
10.5	Tallinn and Helsinki as an integrated cross-border region.....	76
CONCLUSIONS.....		79
11.	Integration scenarios	80
11.1	Introduction	80
11.2	The underlying logic of the scenarios' construction	81
11.3	Partners in Transportation scenario.....	83
11.4	Twin-city scenario	85
11.5	Failed Opportunities scenario.....	86
11.6	Alliance for New Beginning scenario	88
12.	Territorial Impact Assessment	94
12.1	Aims and method	94
12.2	Empirical analysis	95
12.3	Territorial Impact Assessment.....	99
13.	From knowledge platform to decision support system.....	102
13.1	Idea of knowledge platform	102
13.2	Decision support system – a novelty in planning.....	104
13.3	Concept and structure	105
13.4	Data collection	106
13.5	Technical coding, needed collaborations	108
13.6	Final result, first user feedback	109
13.7	Expected next steps.....	109
14.	Focus group reports	111
14.1	FG Business development	111
14.2	FG Urban Planning.....	112
14.3	FG Transport.....	114
14.4	Conclustions of the focus gropus.....	115
15.	Conclusions.....	121
15.1	Roadmap to Helsinki-Tallinn transport system - Integrated transport and city planning approach	121
15.2	Strategies	123
15.3	Joint actions.....	126
15.4	Implementation and challenges of governance.....	127
15.5	Future research needs	129

1. Introduction

*Katri-Liis Lepik, NPA Helsinki-Tallinn Euregio
and Ulla Tapaninen, City of Helsinki*

1.1 Background

More than seven million one-way trips are made between Tallinn and Helsinki every year. The density of both passenger and cargo traffic is high. The impacts of Finnish tourists for Tallinn economy and Estonian workers for Helsinki economy are undeniable. Consequently, both Helsinki and Tallinn clearly benefit from each other. But there is not enough knowledge of the full scale of the relationships between the two capitals. How closely are the cities connected already and what will it be the future? What kinds of actions are needed on the both side of the bay to enable the best possible future development for both cities?

The development of a twin-city based on the two adjacent capitals, Helsinki and Tallinn, could serve as an important driver of regional integration between the two countries and have a significant impact on the geo-economic situation on the Eastern shore of the Baltic Sea. A few years ago, Rail Baltic railway connection to Central Europe was merely a dream, but by today it has started to take concrete shape in the form of commitments from the central governments of the countries along the transport corridor. Rail Baltic will further impact the tightening of logistical connections and providing a window of opportunities for the twin-city region.

Altogether 14 partners representing the regional, municipal and academic stakeholders were convened together in the project H-TTransPlan – Helsinki-Tallinn Transport and Planning Scenarios in 2011. The project was led by NPA Helsinki-Tallinn Euregio and the key stakeholders were the City of Helsinki, City of Tallinn, Harju County Government, Uusimaa Regional Council. The academic views were brought to the project by the researchers of Tallinn University, Aalto University, University of Turku, University of Tartu and Estonian Academy of Arts. The project was supported by 13 associated partners among which there are the relevant ministries, representatives of harbours from both sides of the Gulf, and ferry companies such as Tallink Group, Eckerö Line and Viking Line.

The project has focused on integration of Helsinki-Tallinn capital regions from the point of view of better planning of transport and infrastructure in the region. During the project approximately 50 institutions and several hundreds of people have been involved in

roundtables and focus groups representing research and planning institutions as well as the business sector with mostly logistics, transport and tourism companies. They have discussed global trends and change factors influencing transport flows and routes, the future scenarios of the region and plans related to local and regional transport systems.

1.2 Structure of the report

The project has resulted in a number of studies. Short summaries of each study are presented in this report in the first three sections of this report. First, people's mobility is discussed by presenting the results of interviews of passengers in Helsinki and Tallinn ferries and Tallinn airport. People's mobility has also been studied by using mobile positioning methodologies worked out in the Department of Geography of University of Tartu. Additionally events as motivation for travel have been studied separately by University of Tartu.

University of Turku Centre for Maritime Studies has carried out a survey on cargo traffic on Helsinki-Tallinn route. In order to have a clearer picture of the case, also truck drivers have been interviewed by Helsinki Region Transport. Thereafter, calculations of CO₂ emissions of various transport alternatives have been made by Lappeenranta University of Technology.

In the third part of this report, the economic relationships are studied both by BDA Consulting and Kaupunkitutkimus TA Oy. The first clarifies the type and characteristics of the business relations, while the second calculates the monetary flows between the cities.

The last part of the report starts by presenting the possible future scenarios of the relationships between Helsinki and Tallinn made by the Estonian Institute for Futures Studies. Thereafter, territorial impact assessment made by Helsinki University of Technology is presented. Urban planning specialists of the Estonian Academy of Arts developed a knowledge platform (www.talsinki.net), which provides the planners and decision-makers, as well as the general public, with a better idea of transport and infrastructure-related projects in progress at either shore of the Gulf of Finland. It contains systematised information about the Helsinki-Tallinn region's related transport and infrastructure projects, their partners and actions, links to relevant past and present development documents and strategies. The knowledge platform helps notice the mutual links between the various projects.

During the project there were three focus groups representing various institutions of the both cities discussing the twin-city development. Their work is presented in Chapter 14. Finally, the future actions for the development are suggested and discussed and the future research needs are outlined at the end of the report.

1.3 Acknowledgement

This report is made as a part of the Helsinki-Tallinn Transport and Planning Scenarios project, also called H-TTransPlan, which is an ERDF project funded by Southern Finland-Estonia sub-programme of INTERREG IV A 2007–2013 Programme. The H-TTransPlan project studies development needs of the Helsinki-Tallinn region in the viewpoint of logistics and regional planning. This report presents summaries of the studies made in the project.

The publication reflects the views of the authors. The Managing Authority of the INTERREG Central Baltic IV A Programme cannot be held liable for the information published in this report.

We thank all the hundreds of people who have contributed to this work. We hope this work helps Tallinn and Helsinki on their way to the common future.



PASSENGER STUDIES



2. Passengers travelling between Helsinki and Tallinn

*Ulla Tapaninen, City of Helsinki City Planning Department
and Pekka Mustonen, City of Helsinki Urban Facts*

2.1 Background and aim of the study

The aim of this interview round was to have more information of passengers travelling between Estonia and Finland. It was already known that in 2011 the number of one-way trips on vessels was 7.35 million and over 1 million passenger cars was carried over the Gulf of Finland (Finnish Transport Agency, 2012) – these figures may have the same people and cars several times.

It was also known that in 2011 there were over 700 000 Estonians visiting Finland and only 5% of them were came by air, 2% by land, and the rest by sea. 40% of Estonians came to Finland for work and the others mainly for leisure. 7% of Estonians were in Finland on transit. Moreover, 32% of Estonians visited only one day and the rest stayed longer (Border interview survey, 2012). About Finnish travelers it was known that they make 2.34 million trips to Estonia, of which 29% were for work or for a meeting and 50% of the trips included a stay overnight (Statistics Finland, 2012). These figures do not include the truck drivers that are more closely presented in Chapter 7.

The aim of this study was to have more information of the people travelling between Finland and Estonia. The questions included the following aspects among others: what was the reason for the travel, which transport mode was used when leaving/coming to the port, how many times they are planning to travel the next year, do they have a working place and are they planning to move to the destination country, how much money is used in the destination, and did they stay in Helsinki and Tallinn or did they travel further.

2.2 Methodology of the study

Passenger surveys were carried out in the Helsinki Tallinn vessels, namely Linda Line (only 2 first rounds), Eckerö Line, Viking Line and Tallink vessels leaving from harbours of South Harbour, West Harbour and Katajanokka. The interviews took place every week day and they were carried out between July 2011 and April 2012. There were four rounds of the interviews. The number of succeeded interviews was:

- July–August 2011: 1 020 persons
- October–November 2011: 1 000 persons
- February–March 2012: 1 116 persons
- April 2012: 1 001 persons
- Total 4 137 persons

During the second, third and fourth round half of the people for interviews were chosen randomly and 50% was chosen so that:

- 30% of total number of the interviews was chosen to be Estonians leaving Finland. Half of these (15%) should be workers.
- 20% were Finnish workers coming from Estonia.

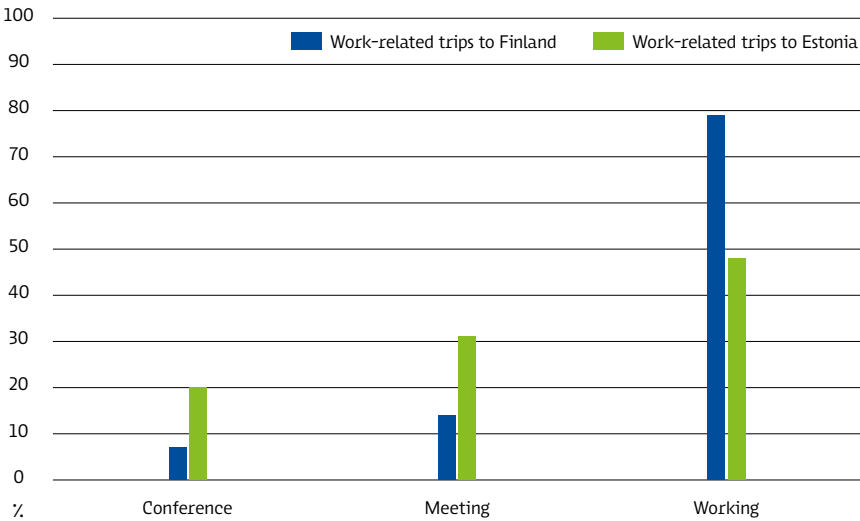
The first interviews in July-August were carried out in both in the harbours of Helsinki (Katajanokka, South Harbour, West harbour) and onboard vessels. There were two types of questionnaires to be used, long version mainly onboard and short version at harbours. The rest of the interviews from October till April were carried solely onboard vessels by using long questionnaires. In total, the short version was used only in 345 interviews and only 500 interviews were carried out onboard vessels.

2.3 Results

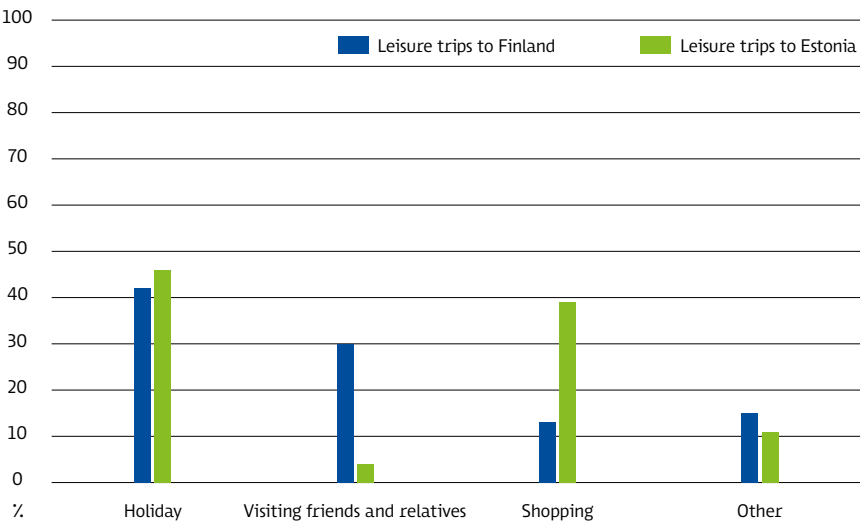
In the data set almost all of the passengers travelling from Estonia to Finland and back were Estonians and almost all of the passengers travelling from Finland to Estonia and back were Finns. For the case of simplicity we will call the first groups as “Estonians” and the second group as “Finns” even though there are some people with other nationalities. We will also call people travelling for reasons of work, i.e. conferences, meetings or actual work, “workers” and all the rest are called “non-workers”.

The Estonian workers travelling to Finland destined mostly (79%) for actual work, 7% for conferences and 14% for meetings. Similarly, most Finnish workers (49%) travelled for actual work in Estonia, and 20% for conferences and 31% for meetings. 60% of the all Estonians remained in Helsinki while 82% of all the Finns stayed in Tallinn and others travelled to other destination in the countries.

Work-related travelling in Finland/Estonia



Leisure travelling in Finland/Estonia



Travelling during next year

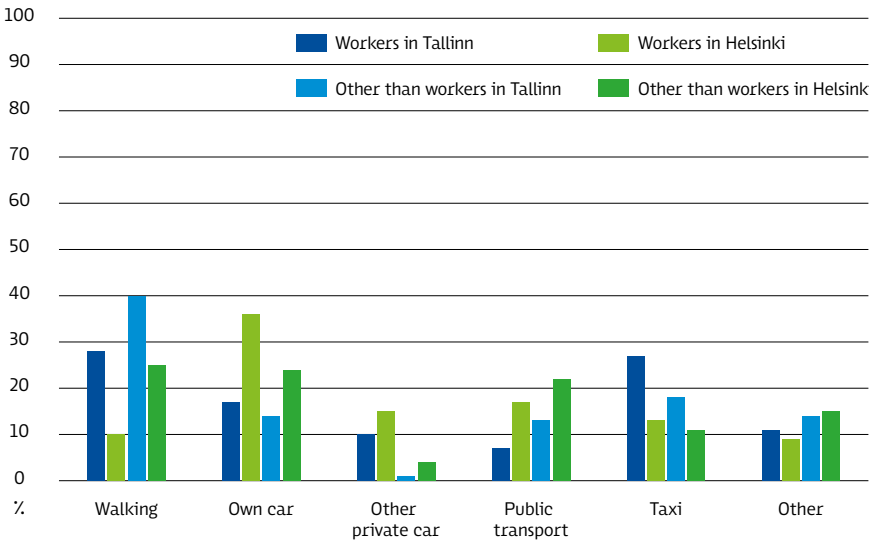


The Estonians non-workers were mostly for holiday (42%) or visiting friends and relatives (30%). The Finnish non-workers were going for holiday (46%) and shopping (39%).

It is obvious that many people travel between Finland and Estonia several times a year, the only group that does not travel so many times are Finnish non-workers. During next year most Estonian workers (68%) will also travel to Finland 5 times or more, as well as most (26%) Estonian non-workers will also travel 5 times or more. Similarly, many (27%) of the Finnish workers said that they will travel 5 times or more to the Estonia during next year, but on the contrary most Finnish non-workers (29%) will travel once or twice to Estonia during next year.

About the future, it was asked how many Finns and Estonians could think of working in the other country (answers yes or maybe). Only almost half (49%) of Finnish workers said they could work permanently in Estonia, while 26% of Finnish non-workers could think of working in Estonia. For the Estonians, the idea was more familiar. 89% of Estonian workers thought they could work permanently in Finland as well as 46% of Estonian non-workers.

Means of leaving the port area in the destination country



When it was asked that are people really planning to move to either Finland or Estonia, only 23% of Estonian workers and 9% of non-workers were planning to move. Similarly only 4% of Finnish workers are planning to move and 2% of non-workers.

It was also asked, how much money the travelers use on their travels. On average, Estonians and Finns use both approximately 220€ per visit. Finns use most money in accommodation and then shopping, groceries, souvenirs, alcohol and other things. Interestingly, Finns use more money in other shopping than alcohol. Estonians use most money in accommodation and shopping, mostly groceries.

It is noticed that public transport is not very popular in neither of the harbours, only 7% of the working Finns and 13% of the non-working Finns and 17% of the working Estonians and 23% of the non-working Estonians used public transport while leaving the port area in the destination country. Estonians used mostly their own private car (36% of workers and 24% of non-workers) and Finns were going on foot (28% of workers and 40% of non-workers). Also Finns used a lot of their own car (17% of workers and 14% of non-workers), but for Estonians going by foot was rare (10% or workers and 25% of non-workers). Also taxi was a popular mode of transport for Finns (27% of non-workers and 18% of workers), but not so much for Estonians (13% of workers and 11% of non-workers). We also learned that people come to harbours mainly the same way they leave the harbours.

2.4 Conclusions

There are more than 7 million people travelling between Finland and Estonia. The number of air travelers is under 3%. Before this study began, it was already known that both working and travelling for leisure are common for both Finns and Estonians. Based on this study, we know now that many Estonians (40%) come to Finland for work, but even more – half of the Estonians – come for leisure. By comparison, 29% of Finns travelling to Estonia do it because of their work, but most Finns come to Estonia for leisure.

This study gave us a more informative picture of the passenger transport between Finland and Tallinn. In this study we learned that work and leisure differ slightly in Estonian and Finland. For Finns in Estonia the share of conferences and meetings was about 50% of working trips while for Estonians in Finland it was only about 20%. Also leisure time differed, Estonians visited a lot their friends and relatives while the same number of Finns used their time in shopping.

Interestingly, it was found that both Estonians and Finns use about the same amount of money in their trips and both use more money on other shopping than alcohol.

It is obvious that many people travel between Finland and Estonia several times a year, the only group that does not travel so many times are Finnish non-workers. Surprisingly also Estonian non-workers travel several times a year to Finland. This shows that the relationships with friends and relatives are close.

We also learned that it was very common for people from both countries to imagine that they could work in the other country, the percentages were higher on Estonians than Finns, but even quarter of Finnish non-workers could think about working in Estonia. However, when people were thinking about moving permanently to the other country the numbers drop dramatically. Only a quarter of Estonian workers could think about living in Finland, while with other groups the figures remained under 10 percent.

For the city planning of Tallinn and Helsinki, it was important to know how people come to the harbours and leave them. The most common way of travel was that Finnish non-workers walked from the harbours, and the second most common way of travel was Estonian workers using their own private cars. The use of public transport was more common in Helsinki than in Tallinn. This means, that walking, public transport and fluent use of private cars should be supported when planning the port infrastructure.

The more exact report of these interviews will be published during winter 2012–2013.

REFERENCES

- Border Interview Survey, 2012
- Finnish Transport Agency, 2012
- Statistics Finland, 2012
- Innolink Oy, Liikkuvuustutkimus Helsinki-Tallinna, 2012, data set.

3. Air passenger survey

Anu Rentel, Tallinn City Office

3.1 Aim and methodology of study

The aim of this study was to determine the number of people who travel between Tallinn and Helsinki by plane; the profile of these air passengers; the main characteristics of their travels; and the kind of services air passengers use while visiting cities.

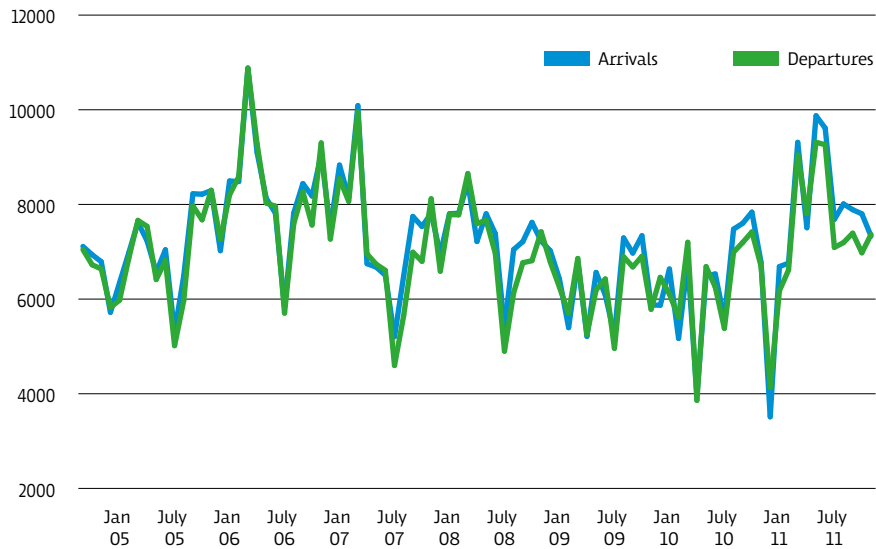
This report is primarily based on the survey carried out by Turu-uuringute AS at Tallinn Airport from 17 November-4 December 2011. The airport's traffic data and its own passenger surveys were used as background information.

The target group of the Turu-uuringute AS survey was people aged 15 years and older who travelled between Tallinn and Helsinki by plane. The methods used were face-to-face interviews and questionnaires that the respondents completed independently. The survey was carried out at Tallinn Airport, with the interviews conducted in four languages: English, Finnish, Russian and Estonian. The interviewees were departing passengers: foreigners who had arrived in Tallinn by air and Estonian residents who gave Helsinki as the final destination of their air travel. Transit passengers were not interviewed because the survey was designed to study travel between Tallinn and Helsinki expressly. The size of the random sample was set at 350: 175 residents of Estonia and 175 foreigners. However, the actual number of travellers was insufficient to carry out probable random sampling; instead, practically all target group travellers were surveyed. The final sample size was 283, including 50 Estonian residents and 232 foreigners. The fieldwork revealed that there were very few Estonian residents suited to the target group, as they often fly to Helsinki in order to travel on to other destinations.

3.2 Tallinn Airport traffic data and passenger surveys 2004–2011

The number of passengers who flew between Tallinn and Helsinki from 2004–2009 was ca 6000–8000 per month of both arriving and departing passengers. The peak month for passengers is usually March, while the number is generally lowest in July. The average number of passengers in 2009 and 2010 was ca 6000 per month, increasing to 7700–8000 in 2011. Statistics indicate that passenger numbers are on the rise, but that the peak period and low point have changed.

Passengers on scheduled flights between Tallinn and Helsinki



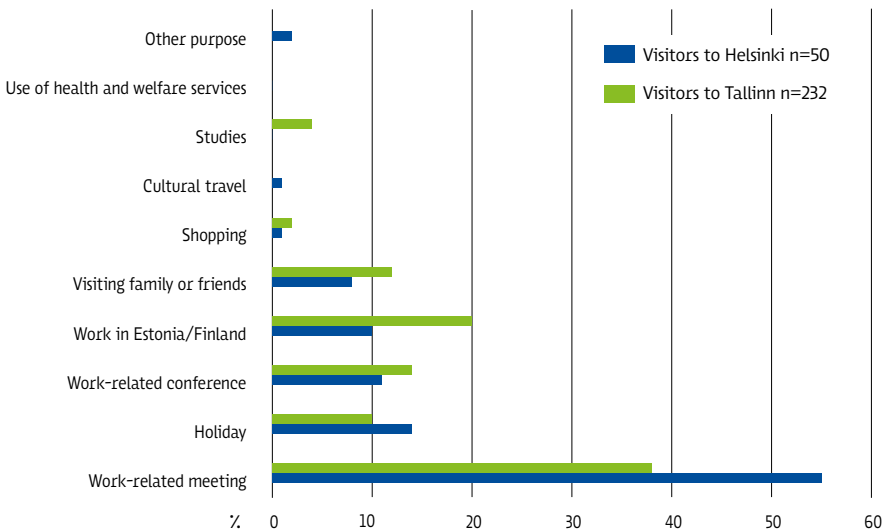
Source: Tallinn Airport

The Tallinn Airport passenger survey carried out in 2011 indicated that 78% of passengers who fly to Helsinki immediately fly on to other countries; Finland is the destination for just 22% of travellers. The proportion of transit trips has grown: in 2004, for example, they accounted for just 45% of travel on the route.

In terms of the country of residence of travellers, the proportion of Finnish passengers has decreased over the years while that of passengers from other countries has increased; the proportion of Estonian passenger has changed the least.

When we look at trips where the destination is Estonia or Finland, the difference in numbers between Estonian and Finnish passengers is not that great; when we look at transit travel, it can be seen that Estonians use Helsinki as a transit hub much more frequently than Finns do in the case of Tallinn. However, Estonian Air's new flights to different cities in Finland are likely to influence transit travel to some degree.

Main purpose of travel



3.3 Why people travel by air between Tallinn and Helsinki

According to the survey conducted by Turu-uuringute AS, air passengers mainly visit Tallinn and Helsinki on business – attending meetings or conferences or going to work there. Such trips account for around three-quarters of all travel. (These results are similar to those of Tallinn Airport’s regular passenger surveys – if the travel destination is Helsinki, most trips are work-related; but in the case of transit travel, relatively more trips are taken for holidays and to visit friends and relatives.)

The main reason for visitors to both Helsinki and Tallinn to travel by air is that it takes less time than travelling by sea (40% and 58% respectively). Some visitors consider flying more pleasant than travelling by sea; some have to take into account the requests of employers or fellow passengers; and some are unable to find suitable departure times for ferries.

Trips made to Tallinn or Helsinki by plane usually last for a couple of days – just 18% of passengers spend more than 4 nights in Helsinki, while only 24% spend more than 4 nights in Tallinn. The trips made by Finnish nationals are usually shorter in duration

than those of people from countries further afield: 26% come for the day, 35% stay for the night and 21% stay for 2–3 nights.

The majority of air passengers also only visit the capital cities: 68% of those who fly to Helsinki only stay in the city when in Finland, while as many as 81% of those who visit Estonia travel no further than Tallinn.

3.4 Use of transport services and need for information

The main means of transport for air passengers in both Helsinki and Tallinn is taxis (24% and 51% respectively). Public transport is used considerably more often in Helsinki than in Tallinn, for travelling both within the capital and outside of it. Ordering a bus or renting a car is also much more common in Helsinki.

With regard to developing municipal e-services in Tallinn, visitors to the city were asked whether they would use public transport or park their cars more often if they could pay to do so using their mobiles or over the Internet. One in ten respondents said that mobile or online payments would encourage them to use the services more often.

Although the majority of trips are work-related, air passengers are most interested (ca 75%) in information about recreational opportunities and shopping. Almost half of those surveyed are interested in the business environment and transport of the cities. Interest in leisure and shopping options shows that visitors like to combine their work-trips with personal interests.

It is perhaps not surprising that the most popular information channel for people visiting both Tallinn and Helsinki is special websites.

3.5 Trends in travel

The average frequency of travel to Tallinn or Helsinki is 2–5 times per year (although the survey did not specify whether air travel was used for every visit). Helsinki is visited more often than Tallinn, on the whole. This could be explained by the fact that among the passengers there are more Estonian residents who work in neighbouring country. According to the respondents, their frequency of travel is unlikely to change significantly in the coming year (with Estonian residents continuing to travel slightly more often than passengers from other countries).

Also, when asked about the longer term, the majority of passengers predicted that their frequency of travel would not change within the next 5 years. There were 10–15% more passengers who felt that their frequency of travel would increase than those who felt it would decrease in that period (taking into consideration both holidays and work-related

trips to Tallinn and Helsinki). It would therefore seem that while major changes are unlikely to occur in the next five years, an increase in travel frequency is the trend.

What is the influence of the length of trips on travelling? If the duration of travel between Tallinn and Helsinki were significantly shorter, 26% of visitors to Tallinn and 30% of visitors to Helsinki would travel more often. It is interesting to note here that the duration of travel is more important to women than it is to men.

The study also revealed that the closer the personal contacts a traveller has in the destination country (friends, family et al.), the more frequent their trips.

In the context of frequent travel and close personal contacts between the two cities, the passengers were asked whether they had considered moving to the other country. 22% of Estonian residents said that there is likelihood of them going to work in Finland; 17% of foreigners said they might come to work in Estonia. However, only 4–5% of respondents said that this was highly probable. Moving permanently to the other country was less probable than working there – just 14% might move to Finland, and only 8% to Estonia.

3.6 Conclusions

- 183,860 passengers flew between Tallinn and Helsinki in 2011 (according to Finnavia). The number of air travellers on the route represents less than 3% of all travellers travelling between Tallinn and Helsinki.
- Around three-quarters of the passengers who fly to Helsinki are transit travellers and immediately continue on to other countries; Finland is the destination for just a quarter of passengers. Estonians make use of Helsinki as a transit hub much more often than Finns do of Tallinn. The number of passengers from other countries travelling between Tallinn and Helsinki is growing.
- Passengers travel to Tallinn or Helsinki by plane mainly for business – they attend meetings and conferences and go to work there. In spite of this, passengers are most interested in obtaining information about leisure opportunities and shopping.
- The main reason for preferring planes over ferries is speed.
- According to passengers, the frequency of their travel between Tallinn and Helsinki is likely increase slightly in future. Faster connections would also increase this to some extent.
- $\pm 20\%$ of passengers would contemplate working in the destination country and $\pm 10\%$ would contemplate moving there. Finland is a more attractive destination than Estonia.

REFERENCES

Turu-uuringute AS. (2011). Survey of people travelling between Tallinn and Helsinki – air passengers. [www] <http://uuringud.tallinnlv.ee/document.aspx?poid=11282&guid=35ffcec8-40b1-341f-10f7-7bb1234ba478>

4. Spatial Mobility between Tallinn and Helsinki in Mobile Positioning Datasets

Statistical overview

*Siiri Silm and Rein Ahas, Mobility lab, Department of Geography,
University of Tartu and Margus Tiru, Positium LBS*

4.1 Aim and methodology of the study

The objective of this study is to provide an overview of people's mobility between the Estonia and Finland with focus on the routes Tallinn–Helsinki and Helsinki–Tallinn. Due to the fact that the state borders in the European Union have been opened, there is a lack of border statistics. It is difficult to collect solid reference data concerning cross-border flows. We are using anonymous data from passive mobile positioning (Ahas & Mark 2005; Ahas et al. 2008; Silm & Ahas 2010) in order to study the mobility patterns between Helsinki and Tallinn. As capitals, Tallinn and Helsinki are homes to the most important harbours and airports in Estonia and Finland, and most of the traffic between the two cities takes place through these harbours and airports. This means that the people travelling between Tallinn and Helsinki need not necessarily originate from Tallinn or go to Helsinki but may come from or go somewhere inland instead. While the data we have collected enables us to study the geographical distribution of the movements within Estonia, we could only detect the arrival to, stay in and departure from Finland. Like any data, mobile positioning has several drawbacks, for instance, with regard to sampling and data management issues, which will be discussed in connection to the method.

The authors would like to thank Positium LBS and EMT for their support in methodological and technical development and data provision and Anto Aasa and Liis Murov

for helping with data and analysis. We would also like to thank all anonymous mobile subscribers, whose data was used in this study. The methodological and theoretical development of research based on mobile positioning in the University of Tartu has been supported by the Estonian Information Technology Foundation (EITSA) and the Target Funding Project No. SF0180052s07 of the Estonian Ministry of Education and Research grants No. ETF7562 and ETF7204 of the Estonian Science Foundation.

The privacy of the phone owners is strictly protected in this study according to the EU data protection regulations. The requirements specified in the EU directives on processing personal data (Directive 95/46/EC) and the protection of privacy in the electronic communications sector (Directive 2002/58/EC) were strictly implemented and evaluated by the Estonian Data Protection Inspectorate. The phone numbers used in the sample of this study were made anonymous in the mobile operator's system and cannot be decoded. The identity of respondents cannot be disclosed by random identification codes or spatiotemporal behaviour patterns, as only aggregated data was used for the study.

In this study, we used Call Detail Records (CDR) data from the memory files of the biggest Estonian mobile operator EMT. The market share of EMT is considered to be 40–45% in Estonia; its radio coverage is spread over 99.9% of Estonian territory. We exploited data about the use of foreign telephones (roaming) in the EMT network for incoming tourists and the use of EMT phones in foreign countries for outgoing visits. The management of data was handled by Positium LBS, the methodology for segmenting tourism data was developed in cooperation with the Bank of Estonia in order to obtain statistics for the calculation of travel items for balance of payment (Positium 2009).

The database comprised data about activities between 1.01.2009 and 31.12.2011. The database consists of call activities (time, location) of random IDs. The country of origin or nationality of visitors is determined here on the basis of the registration country of the mobile phone (Kuusik et al 2011).

Data recorded on the call activity used in the study

Phone user	ID	Time	Location
Foreign (roaming) phone in Estonia	Country; Random ID	ss:mm:hh dd:mm.yy	Network cells
Estonian phones (roaming) abroad	Random ID	ss:mm:hh dd:mm.yy	Country

Based on this passive positioning data we generate various statistics to describe mobility:

Visitor – unique person (mobile phone user) who is travelling to another country, have done call activity(ies) there.

Visit – unique visit to another country by a person. One visit is normally composed by 2 trips: first in to destination and second back home from the destination. One person can make several visits. We use the visits, which have been done directly from Estonia to Finland in case of Estonians and directly from Finland to Estonia in case of Finns, without transit or stopping in a third country.

Trip – unique one way trip to another country by a person, for example trip from Estonia to Finland; or trip from Finland to Estonia.

Number of days – duration of one visit in days.

Number of nights – duration of one visit in nights. The formula for calculating the number of nights in one visit is: $\text{nights} = \text{days} - 1$.

The geographical resolution for the analysis in Estonia is the city of Tallinn, Harju County and the entire Estonia. Finnish visitors in Estonia are studied on the basis of the locations of call activities. In case of Estonian phone users, the locations of home and work districts are measured with the anchor point model (Ahas et al. 2010).

4.2 Estonians in Finland

The results indicate that on the average 328 152 Estonians visit Finland per year, making 1 368 120 visits to Finland, including 154 970 people from Tallinn, who make 535 589 visits on the average. The number of visits Estonians make to Finland is slightly larger during summer months (July, August). In August, the month with the largest number of visits, Estonians make on the average 137 318 visits to Finland, including 51 215 visits by people from Tallinn.

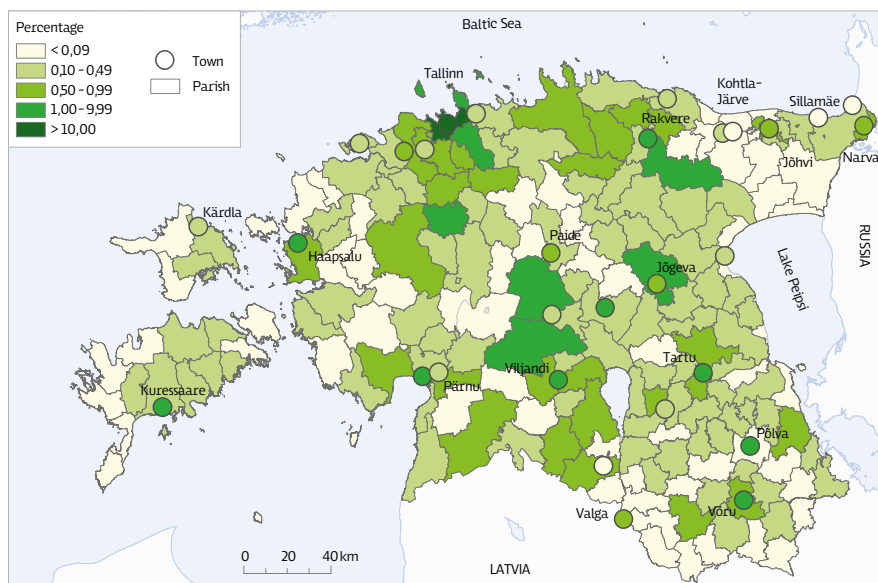
The duration of visits made to Finland by Estonians by region of residence

Duration of visits	Tallinn		Harju County		Estonia	
	Number of visits	%	Number of visits	%	Number of visits	%
Transit	73 748	14.1	103 594	13.4	156 576	11.6
1 day	170 843	32.6	243 655	31.5	368 798	27.4
2 days	103 932	19.8	150 466	19.4	243 663	18.1
3 days	48 752	9.3	71 048	9.2	126 207	9.4
4 days	31 747	6.1	47 245	6.1	88 676	6.6
5 days	21 115	4.0	33 084	4.3	63 911	4.7
6 days	12 762	2.4	19 791	2.6	41 389	3.1
7 days	8 225	1.6	12 680	1.6	28 689	2.1
8 days	6 908	1.3	11 086	1.4	25 544	1.9
9 days	5 748	1.1	9 543	1.2	23 235	1.7
10+ days	39 886	7.6	71 484	9.2	180 487	13.4
Total	523 666	100.0	773 678	100.0	1 347 176	100.0

The month with the smallest number of visits is most frequently February, when Estonians make on the average 88 786 visits to Finland. There are more Estonians in Finland during the working days (Monday to Friday) and less on Saturday and Sunday. During the working days, there are on the average 14 622 Estonians in Finland, compared to the 11 547 on Saturday and 1 213 on Sunday. Estonians travel from Estonia to Finland most often on Mondays and from Finland to Estonia on Thursdays and Fridays, which indicates that they work in Finland. 88% of all the visits are made to Finland as the country of destination and 12% as the country of transit; the importance of transit visits for people living in Tallinn is 14%. The relative importance of Estonians who visit Finland 5 or more times a year is 19% for the territory of Estonia, while the same indicator is 22% for the people living in Tallinn.

The duration of the visits Estonians make to Finland is on the average 4.5 days. For people living in the Harju County and Tallinn, the figure is significantly lower, being respectively 3.6 and 3.3 days. Estonians make the majority of the visits from Estonia to Finland last for one day. From the people who travelled to Finland, the relative importance of the people who spent more than 30 days there is 15% in all areas. The number of the inhabitants of

Percentage share of the local governments of the places of residence of the people from Estonia who have spent 183 days or more in a year in Finland



Tallinn who spend 183 days or more in Finland is 5 260 (3%), while for the entire territory of Estonia the indicator is 13 652 (4%). It is very likely that the majority of these people work or have family relations in Finland. 24% of the visitors who spend 183 days or more in Finland live in Tallinn, 37% in the Harju County (including Tallinn) and 63% in other counties in Estonia.

4.3 Finns in Estonia

An average of 1 594 766 Finns visit Estonia per year, 64% of whom visit only Tallinn and 81% of whom only the Harju County. Finns make an average of 2 520 377 visits to Estonia and 1 327 299 to Tallinn. A seasonal rhythm is apparent in the visits that Finns make to Estonia, including Tallinn: the number of visits is highest in July (an average of 326 848 visits) and lowest in January (an average of 96 616 visits). There are on the average 19 575 and 22 022 Finns in Estonia on Friday and Saturday respectively, which is more than on other weekdays – this clearly indicates that the majority of the visits are made for leisure. An average of 15 224 Finns are in Estonia on working days and 19 570

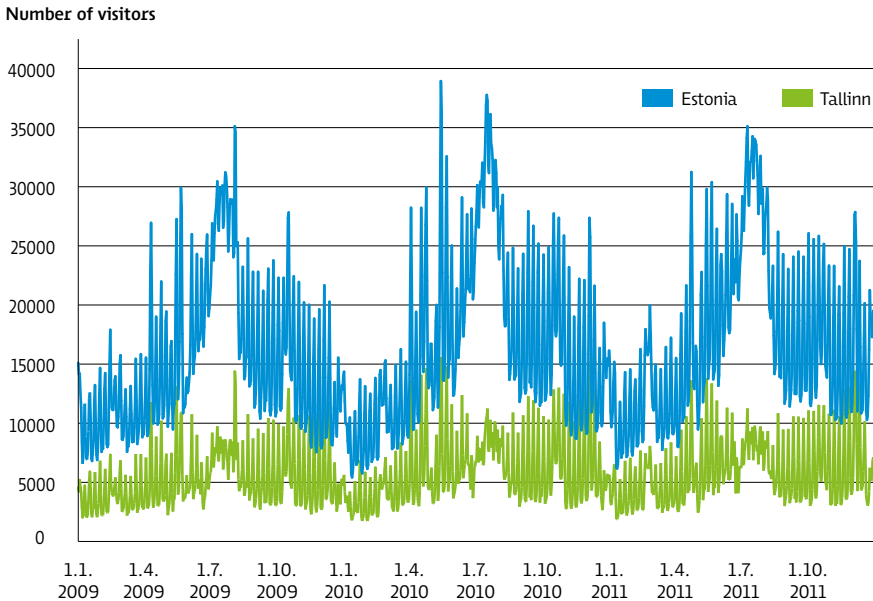
on weekends. The respective numbers for Tallinn are 4 418 on workdays and 7 701 on weekends. Finns travel to Estonia most frequently on Fridays and Saturdays and from Estonia to Finland on Saturdays and Sundays. The percentage of visits made by Finns to Estonia as the country of destination is 92% and 8% as the country of transit (87% and 13% respectively, of the visits limited to Tallinn). The relative importance of Finns who visit Estonia frequently (5 or more times per year) is 4%.

The average length of the visits Finns make to Estonia is 2.4 days, while it is 1.6 for the visits made to Tallinn. Approximately half of the Finns who have visited Estonia only stay in Estonia one day per year; the percentage of the Finns who stay in Estonia for more than 30 days is slightly over 1%. 1 155 Finns stayed in Estonia (including Tallinn), and 591 stayed in Tallinn for more than 183 days, which amounts to 0.1% of the visitors for both areas.

The duration of the visits made by Finns from Finland to Tallinn, the Harju County and Estonia

Duration of visits	Tallinn		Harju County		Estonia	
	Number of visits	%	Number of visits	%	Number of visits	%
Transit	155 176	13.2	181 176	10.7	188 894	8.1
1 day	605 421	51.7	829 185	49.0	995 209	42.7
2 days	279 844	23.9	437 490	25.9	547 710	23.5
3 days	83 384	7.1	136 066	8.0	249 178	10.7
4 days	19 461	1.7	36 196	2.1	118 419	5.1
5 days	8 017	0.7	16 689	1.0	63 665	2.7
6 days	5 041	0.4	11 242	0.7	38 669	1.7
7 days	4 762	0.4	11 290	0.7	34 649	1.5
8 days	2 983	0.3	7 457	0.4	24 530	1.1
9 days	1 695	0.1	4 606	0.3	12 997	0.6
10+ days	6 339	0.5	19 373	1.1	57 564	2.5
Total	1 172 123	100.0	1 690 769	100.0	2 331 483	100.0

The number of Finns in Tallinn and Estonia by days

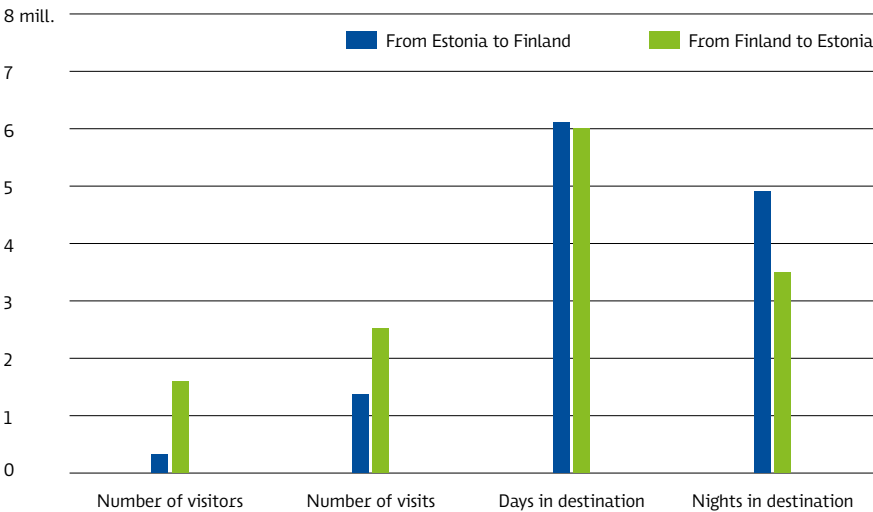


4.4 Conclusions

The results of our study show that the spatial mobility between the two countries is active. More than 0.33 million visitors and 1.35 million visits from Estonia to Finland and more than 1.5 million visitors with 2.5 million visits from Finland to Estonia. At the same time, the number of days spent in the destination is similar – up to 6 million days on both sides. It is sure that the motivations and purposes behind those movements are different, our spatial and temporal segmentation in the study helps to understand this mobility. We can generalise that more than a million Finnish tourists make short visits to Estonia and thousands of Estonians work temporarily in Finland.

The mobile positioning based statistics is an alternative source for determining international mobility flows. We hope that this will add new knowledge to the research on international connections and relationships between the two cities. It must be emphasised that the study includes the people who actively use their mobile phone while abroad, i.e., they have maintained an active connection with their homeland. Clearly there are many persons who use much cheaper local mobile phone services or do not use mobile phones at all while abroad. Sampling and methodological issues require continuous attention in developing and interpreting such new data sources.

Distribution of visitors and visits between Helsinki and Tallinn from mobile positioning datasets (annual average calculated for 2000–2011 period)



REFERENCES

Ahas, R., Mark, Ü. 2005. Location based services – new challenges for planning and public administration? *Futures*, 37(6): 547-561.

Ahas, R. Aasa, A., Roose, A., Mark, Ü., Silm, S. 2008. Evaluating passive mobile positioning data for tourism surveys: An Estonian case study. *Tourism Management* 29(3): 469–486.

Ahas, R., Silm, S., Järv, O., Saluveer E., Tiru, M. 2010. Using Mobile Positioning Data to Model Locations Meaningful to Users of Mobile Phones , *Journal of Urban Technology*, 17(1): 3-27.

Kuusik, A., Tiru, M., Varblane, U., Ahas, R. 2011. Process innovation in destination marketing: use of passive mobile positioning (PMP) for segmentation of repeat visitors in case of Estonia, *Baltic Journal of Management* 6(3): 378 – 399.

Silm,S., Ahas, R., 2010. The seasonal variability of population in Estonian municipalities, *EnvironmeNt and Planning A*, 42(10) 2527-2546.

Silm, S., Ahas, R., Tiru, M., 2012. Spatial Mobility between Tallinn and Helsinki in Mobile Positioning Datasets. Statistical overview.

Positium LBS, (2009). Eesti Pank: Mobiilpositsioneerimisel põhinev turismistatistikute uuring. Tartu.

5. Study of foreign visitors in tourism events in Tallinn

*Kati Nilbe, Siiri Silm and Rein Ahas, University of Tartu
and Erki Saluveer, OÜ LBS Positium*

5.1 Aim and methodology of the study

The aim of this study was to find out if and how cultural events (concerts, exhibitions, spectacles, sports events etc.) that take place in Tallinn affect the number of foreign visitors, their travel behaviour and expenditures. Altogether 18 tourism events that took place from May 31 – August 26, 2012 were examined.

Events analyzed in the study

Date	Name of an event	No. of collected questionnaires
31.05.2012	European Football Championship 2012, qualification U21 (Estonia-Spain)	0
2.06.2012	Tallinn Old Town Days	13
7.06.2012	Concert of Inna	5
8.06.2012	Nero – English DJ-duo of electronical music	7
23.06.2012	Midsummer Day in Estonian Open Air Museum	28
4.07.2012	Õllesummer Festival (Beer Festival)/Alphaville	59
5.07.2012	Õllesummer Festival (Beer Festival)/Mika	60
6.07.2012	Õllesummer Festival (Beer Festival)/Manic Street Preachers	86

Events analyzed in the study

Date	Name of an event	No. of collected questionnaires
7.07.2012	Õllesummer Festival (Beer Summer)	54
12.07.2012	Tallinn Cup 2012 (U19, football tournament)	8
15.07.2012	Tallinn Maritime Days	9
29.07.2012	Bicycle Rally/Heartbeat Tallinn 2012	22
30.07.2012	Concert of Red Hot Chilli Peppers	43
18.08.2012	Birgitta Festival	24
25.08.2012	Concert of Lady Gaga	21
25.05.2012	Ice Cream Festival (Ice Theatre from St.Petersburg)	0
25.08.2012	Taekwon-do ITF MM	22
26.08.2012	Taekwon-do ITF MM	27
	Total	488

At every event, as many adult visitors (at least 18 years old) were questioned as possible. In order to find out the origin, travel motivation, expenses, transport inside Estonia and social-demographical background of visitors, a 20–25-minute interview was carried out during which the visitors were asked 36 questions. In total, 488 questionnaires were collected. The interviews were carried out during the event by personal interviewing by 2–4 field workers every event.

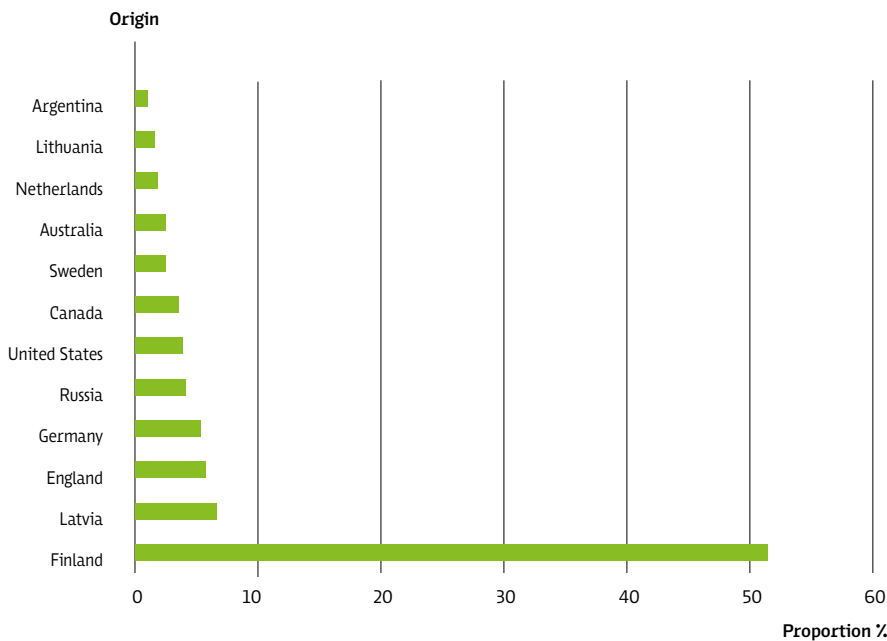
5.2 Main results

The main results of the study are summarized as follows:

According to the results, 67% of visitors were male. It also became evident that almost half of the visitors questioned (44%) had higher education.

The results showed that the age group visiting the most was 20–29 years old. The smallest number of questionnaires was received from visitors over 70 years of age and from less than 20 years of age.

Origin of event visitors



The event visitors were from 37 different countries in which Finland was the most important (51%). Finland was followed by Latvia (7%), England (6%) and Germany (5%). In the top 12, all the neighbouring countries were represented.

Most of the visitors (80%) planned visiting the event before arriving in Tallinn. More than half of the visitors considered visiting the event(s) as one of the most important purposes of their visit to Tallinn. So, the majority of the visitors had planned their visit to the event carefully. This is illustrated clearly by the fact that 35% of the visitors decided to make the first payment connected to their trip more than 9 weeks before the trip.

The most significant motivator for visiting the event appeared to be the type of the event. The wish to spend some quality time with friends and/or family was valued just as highly. The role of locals' suggestions (either in the hotel, tourist information centre or by colleagues with whom visitors had a work meeting etc.) to visit the event was not as important a factor in visitation motivation.

The most important purpose of travel to Tallinn was visiting event(s) and the most common motivator for visiting Tallinn was the visitors' wish to spend some quality time

with friends and/or relatives. So, even though events were a good reason to come to Tallinn, what motivated the visitors, was their friends and relatives.

The main reasons for visiting an event were considered to be the closeness of Tallinn (29%) and the event itself (26%). As these two reasons are strongly connected (for example, if a visitor could not get a ticket from his/her homeland, he/she chose the closest place to go), they could be seen as one of the most important purposes of a visit to an event. Also, pleasant atmosphere of a place (event and/or Tallinn) (10%) and acceptable prices (9%) were named as important factors for visiting the event.

Slightly over half of the event visitors questioned (59%), visited that type of event in Tallinn for the first time and ¼ of event visitors were in Tallinn for the first time. But at the same time more than 35% of visitors were in Tallinn for the 10th time. In general, there were no significant differences between trends of visitation numbers to Tallinn and to Estonia.

Though several competition participants, organizers and members of service personnel were questioned, the most common group of visitors were spectators (91%), who came to see either a concert or to be as a fan at a sport competition.

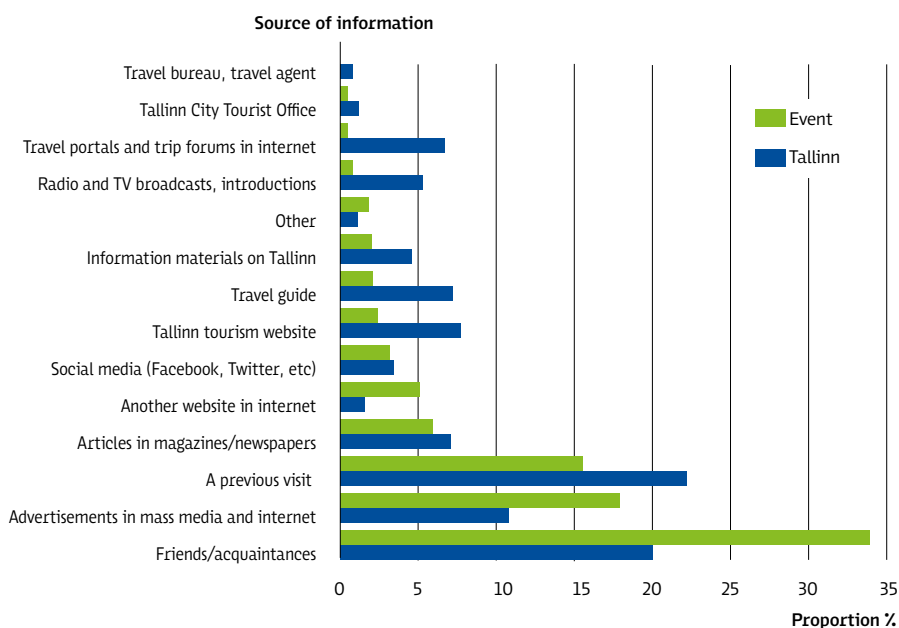
The most common sources of information about Tallinn and the events there were friends/acquaintances/relatives (Tallinn 20% and events 34% respectively), advertisements in mass media and the internet (Tallinn 11% and events 18%), but also previous visit(s) either to an event in Tallinn (16%) or to Tallinn itself (22%). So, the previous experience, either word of mouth from friends or good memories play an important role in the decision making process. Also, an easily accessible source of information, like mass media and the internet, are significant factors.

In general, the visitors were very satisfied with the event, the city of Tallinn and with Estonia. The level of satisfaction with events (8.0 points out of 10), Tallinn (8.7 points) and Estonia (8.8 points) was considerably high. About 75% of the visitors would definitely come back to Tallinn and would also see other places in Estonia. Little more than half of all the visitors (57%) would come back to an event in case it takes place.

The majority of the event visitors, who were not related to Tallinn (61%), were not related to Estonia either (98%). The most common connectors were either relatives, acquaintances, friends (23%) or a job and work-related duties (8%).

The average expenditure in Tallinn per person was 480.00 euros. On average, the visitors spent the most on food and beverages (164.2 euros), accommodation (158.4 euros) and also other expenditures (230.0 euros) that were unnamed. The least money was spent on transport in Tallinn (33.7 euros), entertainment (48.9 euros) and purchases (gifts, souvenirs, etc.) (82.80 euros).

Source of information about the event and Tallinn



Less than 1/10 of the event visitors travelled and stayed at least for a night in another place in Estonia. For example in Pärnu, Tartu or Saare counties. Only four counties – Põlva, Valga, Lääne and Viljandi were not visited by the event visitors during their stay in Estonia.

The most common accommodation facility in Tallinn was a hotel (70%). Less (8%) named friends and relatives. For visitors who also travelled to other places in Estonia, hotels were also important places to stay (44%), but the main difference between Tallinn and other places in Estonia was that in the first case friends and relatives played a more important role (25%).

CARGO STUDIES



6. Cargo flow study on the Helsinki-Tallinn route

*Ulla Tapaninen, City of Helsinki
and Antti Posti, University of Turku Centre for Maritime Studies*

6.1 Aim and methodology of the study

The aim of this study was to analyse the structure and volume of the cargo flows on the Helsinki-Tallinn route. Previously, there are not comprehensive studies related to the Helsinki-Tallinn cargo route. Cargo flow studies in the Gulf of Finland have been focused on the east-west traffic to/from Russian ports because of the importance of Russian foreign trade. There are a lot of studies of port development in Vuosaari (Helsinki) and in Muuga (Tallinn) but the focus of these studies has not been on the Helsinki-Tallinn route. In this study the Helsinki-Tallinn cargo route is examined comprehensively for the first time using statistical analysis and interviews.

The main purpose of the study was to clarify the present situation of the seaborne cargo flows on the Helsinki-Tallinn route and how the cargo flows will develop in the future. The study focuses on the following thematic entities:

- What is the structure of the Finnish and Estonian seaborne transport system and cargo flows?
- What is the structure and volume of the cargo flows on the Helsinki-Tallinn route? The hinterland flows, in the other words the cargo flows between Finland and third countries (other countries than Estonia) transported through the Helsinki-Tallinn route are of particular interest.
- How the volume and structure of the cargo flows on the Helsinki-Tallinn route will develop in the future and what are the determinants behind the present and future transport flows?

- What are the methods of transport and cargo handling on the Helsinki-Tallinn route and how they will develop in the future? This includes also the bottlenecks of the route associated with the different transport methods.

The study is concentrated on unitised cargo on the Helsinki-Tallinn route. In this study unitised cargo means cargo transported by vessels in large units such as containers, trailers, rolltrailers and rail wagons. Most of the cargo between Helsinki and Tallinn is transported as Ro-Ro traffic. Ro-Ro cargo is wheeled cargo such as trucks and trailers that are driven on and off the vessel on their own wheels. Presently, most of the Ro-Ro cargo is transported between Helsinki and Tallinn by passenger car ferries, where both cargo and passengers are on the same vessel. However, some Ro-Ro vessels are seen on the route, where there is no passengers onboard.

The study was carried out as a statistical analysis and an interview study. The aim of statistical analysis was to clarify how the foreign trade and seaborne cargo traffic volumes between Finland and Estonia and especially on the Helsinki-Tallinn route have been developed in the 1990s and in the first decade of 2000s. In addition, the statistics on foreign trade and maritime cargo were compared in order to find out the importance of hinterland connections in the traffic between Finland and Estonia. Statistical analysis was mainly based on the statistics of the Finnish Transport Agency and the Finnish Customs. The interview study was made to complement the picture obtained in the desk research and the statistical analysis. The interview study in the form of semi-structural and thematic interviews was conducted in the Helsinki metropolitan region in the spring 2011. The interviews were restricted to shipping companies carrying cargo on the Helsinki-Tallinn route. In addition, one transport and logistics company was also included in the study. Altogether four companies and six persons were interviewed.

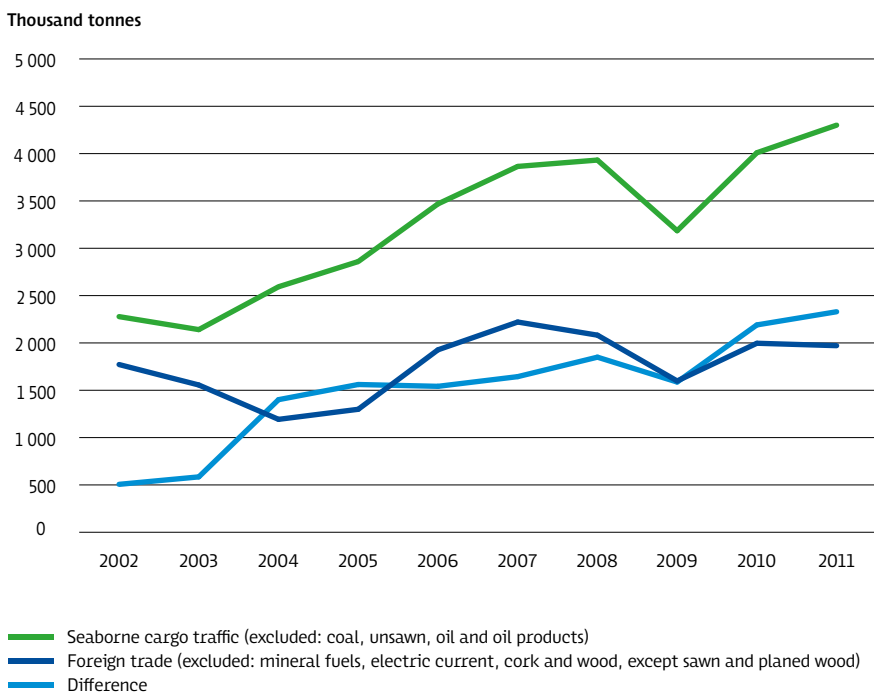
The results of the research are described more detailed in the research report of Sundberg & al. (2012).

6.2 Results of the statistical analysis

Over 80% of Finnish foreign trade is transported by sea. The amount of the Finnish seaborne foreign cargo traffic including transit cargo has almost tripled from 33 million to 93 million tonnes over the period of 40 years, from 1970 to 2010.

Estonia is very dependent on transit cargo coming from or going to Russia. During the period of 1993–2009, the annual share of the transit traffic of the total Estonian seaborne cargo traffic has varied between 63 and 78%. Estonian own exports and imports have had a minor role in the Estonian seaborne cargo traffic. In the year 2010, the total amount of Estonian seaborne cargo traffic was 46.1 million tonnes of which transit cargo accounted for 33.2 million tonnes and Estonian export and import cargo accounted for 12.9 million tonnes.

Total foreign trade and seaborne cargo traffic between Finland and Estonia in the years 2002–2011

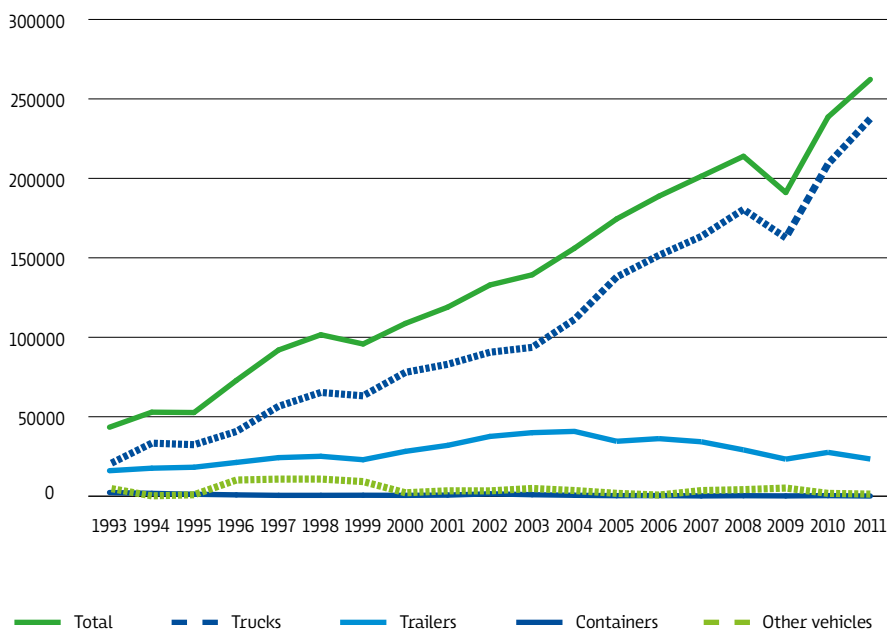


Helsinki and Tallinn are the main ports in the maritime cargo traffic between Finland and Estonia. In the year 2010 approximately 67% of the total cargo between the port of Tallinn and Finland was transported to/from the port of Helsinki. The Helsinki-Tallinn route has become the most significant Ro-Ro traffic route for the port of Helsinki. In the year 1993 only 22% of all the units of trucks and trailers handled in Helsinki was transported via the Helsinki-Tallinn route but in the year 2010 the corresponding figure was 49%.

The statistical analysis revealed that when the volumes of the foreign trade and the seaborne cargo traffic between Finland and Estonia are compared, it can be seen that the growth of the seaborne cargo traffic has been significantly greater than the growth of the trade volume between the countries. During 2002–2010 the seaborne cargo volumes between Finland and Estonia have increased over 76% from around 2.28 to 4.01 million tonnes while the foreign trade has increased only about 3% from 1.77 to 1.82 million tonnes. The gap between the Finnish-Estonian seaborne cargo transports and the Finnish-

Unitised cargo transports between the ports of Helsinki and Tallinn in the years 1993-2011

Number of units



Estonian foreign trade was in the year 2010 about 2.2 million tonnes. The difference between these two factors has grown strongly during the period 2002–2010.

The unitised cargo on the Helsinki-Tallinn route composes mainly of trucks and trailers. The annual amount of truck and trailer units that has transported from Helsinki to Tallinn by sea has increased over 430% from around 23,000 to 120,000 pieces over the period 1993–2010. The annual amount of units that has transported from Tallinn to Helsinki by sea has increased 470% from around 21,000 to 119,000 pieces over the viewed period. The share of the trucks of the total Ro-Ro cargo traffic on the Helsinki-Tallinn route has increased significantly. In the year 2010, the share of trucks was 88%.

The heaviest increase on the volumes has been on passenger cars carried on board the vessel. Their number between 1993 and 1999 remained under 200 000 units per year. In 2003 the number was 275 000 which increased over 1 million in 2011.

6.3 Results of the interview study

The interview study, where several thematic issues were discussed, was made to complement the picture obtained in the desk research and the statistical analysis. The interview study revealed that the interviewees were unanimous that the passenger car ferry concept is the only economical profitable operation mode on the Helsinki-Tallinn route. By carrying both passengers and freight in the same vessel the prices of tickets in passenger traffic can be kept on a level that guarantees adequate passengers flows and thus incomes for the shipping companies operating on the route.

However, the passenger ferry car concept entails some requirements and restrictions. The interviewees articulated that for passengers it is convenient way to travel from city centre to city centre but having passengers onboard brings along some restrictions to the cargo traffic. There might be noise limitations in some harbours.

The interviewees stated that in ferry traffic on the Helsinki-Tallinn route the frequency is high and connections are reliable regardless the season and weather conditions. To the shippers in the manufacturing industries and in the commerce the issue is that one can rely on the schedules. Some minor raisings of speed on the route are not important because the minimum sailing time is already two hours. Inland connections are based on road transport.

Small transport companies using the Helsinki-Tallinn route originate usually from Eastern Europe. These companies usually carry partial loads and they are picking and discharging the loads en route on their way back home. Large transport and logistics companies have a terminal or several terminals in each country on their market areas and they drive trunk lines with full loads between the terminals.

Both the interviews and the statistical analysis showed that there are significant hinterland cargo volumes on the Helsinki-Tallinn route. According to the interviews, other Baltic States than Estonia, Eastern Central Europe, East Europe and eastern corner of South Europe are hinterlands of the Helsinki-Tallinn route. Beside of Latvia and Lithuania, countries like Poland, Czech, Slovakia, Austria, Romania and Bulgaria can be mentioned but also Ukraine and Belorussia.

Finland is and will survive as the final point of the Helsinki-Tallinn route in the north. This means that the Helsinki-Tallinn route is not used in transit traffic from/to Russia. Either the cargo from/to Sweden is not transported using the Helsinki-Tallinn route because Sweden has a direct line to Estonia.

The interviewees described contents of the cargo transported on the route. The export cargo from Finland using the Helsinki-Tallinn route mainly consists of industrial goods and the import cargo to Finland consists of consumer goods. In addition, Finnish metal and furniture industries conduct a lot of subcontracting in the growing economies. The

companies started subcontracting first in Estonia but as the industries usually arrange the subcontracting functions according to the cost level of countries, subcontracting has been expanding to other countries as well. As a result, the eastern Central European and eastern South European economies are expected to grow rapidly. The interviewees were unanimous that the growth will give cargo to the Helsinki-Tallinn route.

The interviewees gave only short term growth estimates for cargo volumes on the Helsinki-Tallinn. It should be noticed that the interviews were made in the spring 2011 and the estimations must be considered against the economic situation of that time. Generally it was seen that the two digit growth rate will continue at least during the couple of years. For example one interviewee estimated that next year the growth rate will be 15% and then 10% followed by another year with the growth rate of 10%.

When IMO's sulphur regulations will come in force in the year 2015, the price of ship fuel will increase and the Finnish export and import will be funneled to the routes where the sea leg is short. The IMO's decision will thus favor the Helsinki-Tallinn route and the route to Western Europe via Sweden. The volumes on the Helsinki-Tallinn route will boost and Rail Baltica could be an option to the Finnish foreign trade. One vision is that the container traffic between Europe and Asia could use the North East passage and north-south flows via Finland could be emerged.

6.4 Conclusions

In the following main results and observations of the study are summarised:

- During the period 2002–2010 the volume of the seaborne cargo traffic between Finland and Estonia has increased significantly while the trend of the trade volume between Finland and Estonia has remained nearly constant. This indicates that the route via Estonia is increasingly used in the Finnish foreign trade. Because the ports of Helsinki and Tallinn are the main ports in the cargo traffic between Finland and Estonia, the role of the Helsinki-Tallinn route as a sea leg in the hinterland connections of Finland has increased.
- The growth of the cargo volume on the Helsinki-Tallinn route was estimated to continue on the annual level of 10% during the next couple of years. In the long run the growth of the cargo volumes depends on the economical and industrial development of the former Eastern European countries.
- The fast and reliable connections year round on the Helsinki-Tallinn route have made it possible for service and logistics companies to reconsider their logistics strategies in a new way in the both side of the Gulf of Finland (e.g. laundry or delivery services). This new way of logistics patterns has begun and even more companies are looking for opportunities in combining the Helsinki and Tallinn together in their service offering.
- When the IMO's sulphur regulations will come in force, the Helsinki-Tallinn route will become one of the main routes also to the Western European markets, besides

of the route via Sweden. The cargo volumes on the Helsinki-Tallinn route may be multiplied due to the regulations.

- The passenger car ferry concept, where cargo and passengers are transported in the same vessel, is seen as the only economical profitable solution on the Helsinki-Tallinn route because cargo and passenger traffic are supporting each other.
- The trucks (vehicle combinations) is seen to remain the main mode of transport on the Helsinki-Tallinn route because general cargo is the main commodity on the route. IMO's sulphur regulations and the changes in the structure of the Finnish industry may create prerequisites for rail road transport in the hinterland connections of Finland.

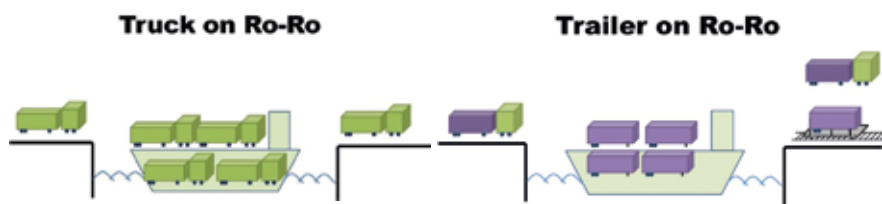
REFERENCES

Sundberg, P., Posti, A. & Tapaninen U. (2011). Cargo Traffic on the Helsinki-Tallinn route, Publications from the Centre for Maritime Studies, University of Turku, A 56. Kouvola: Kopijyvä.

Appendix: alternatives for the cargo transport

There exist various alternatives to carry unitized cargo on vessels. Today the traffic between Helsinki and Tallinn goes on passenger car ferries carrying mainly trucks, but also some trailers are on board. The advantage of trucks is very fast loading, truck drivers drive out of the ferry just in a few minutes. Trailers are trucks without the driver and cabin, and it usually takes few hours to unload a passenger car ferry or a Ro-Ro vessel full of trailers. But on the other hand there are no extra costs on paying the driver during the voyage. In Finnish export to Baltic Sea ports the passenger car ferries with trucks are common on short routes to Sweden and to Estonia, while on the longer routes to Germany and Poland the unaccompanied trailers are more common.

Trucks and trailers on Ro-Ro vessels



There is also an alternative to carry cargo on containers. Containers themselves are quite inexpensive, so they are used mainly on long deep-sea voyages between continents. However, the use of intra-European containers is also becoming more and more common. The cheapest way to use containers is to carry them on a special container vessel, where the cargo space of the vessel is maximised. However, loading the container vessel takes usually a long time, from several hours up to several days. To decrease the loading times, containers can also be carried on passenger car ferries or Ro-Ro vessels on trucks, on special rolltrailers, or on train wagons. There are also possibilities to combine containers, trailers and trucks on the same Ro-Ro vessel.

Containers on container vessels and Ro-Ro vessels



7. Vehicles carrying cargo in ports of Helsinki and Tallinn

Ulla Tapaninen, City of Helsinki and Pekka Rätty, Helsinki Region Transport

7.1 Aim and methodology of the study

Helsinki Region Transport together with Taloustutkimus and Viatrack carried out interviews of truck drives arriving at passenger harbours of Helsinki and Tallinn. The aim of the study was to find out the number and type of the vehicles, what do they carry and where they come from and what is the destination. The interviews were carried out among the truck drivers arriving by road to the harbours both in Helsinki and Tallinn. This way it was possible to reach both southbound and northbound transports.

The interviews were carried out in Helsinki in South Harbour, West Harbour and Katajanokka and in Tallin in Old City Harbour. Line from Vuosaari to Tallinn Old City Harbour is not included in these results. The interviews were carried out in September and October 2012, so that the first interviews were carried out in South Harbour at the last week of September, in Katajanokka the week after, West Harbour the following week and finally in the middle of October 2012 Vanasadam. During every week the interviewing days were the whole days of Tuesday and Thursday. The aim was to have all the vehicles transported during the day to be interviewed, but due to rush moment only 62% of vehicles were interviewed. The total number of interviewed vehicles were 512 in Helsinki and 387 in Tallinn.

The drivers were asked about:

- where do they come from
- where are they destined
- what is the type of the vehicle
- what is the type of the cargo they are carrying.

7.2 Results of the interviews

The results of the studies show that the distribution of the vehicles in Helsinki and Tallinn were

Type of vehicles	Helsinki (%) port of south	Tallinn (%) port to north
Single-unit truck	16.2%	16.1%
Semi-trailer combination truck	70.0%	72.5%
Full-trailer combination truck	6.1%	5,9%
Trailer	7.7%	5.5%

The contents of the cargo in all the vehicles was

Contents	Helsinki (%) port to south	Tallinn (%) port to north
Industrial goods	53.2%	50.2%
Food	10.4%	10.6%
Consumer goods	6.7%	7.8%
Service goods	3.7%	2.4%
Others	14.1%	9.0%
Empty	11.8%	20.0%

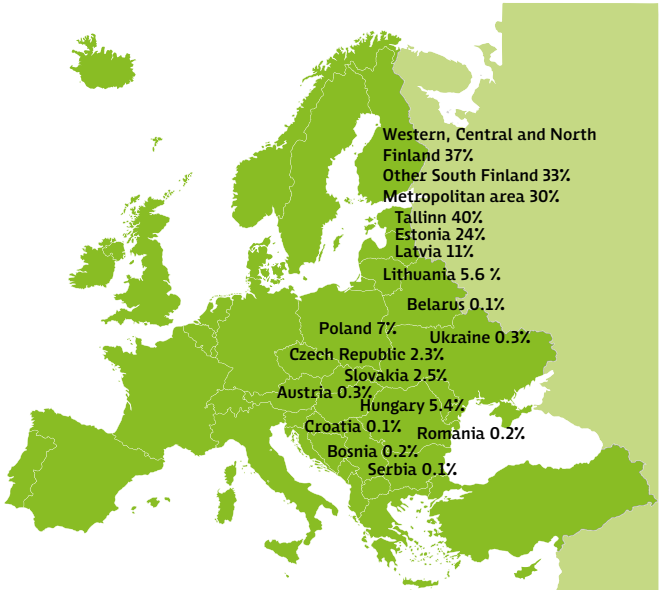
The origin/destination of the vehicles was in Finland

Finland	Helsinki (%) port to south, origin	Tallinn (%) port to north, destination
Helsinki, Espoo, Vantaa, Kauniainen	27.9%	40.0%
Other metropolitan area	6.4%	9.8%
Other Uusimaa and Riihimäki area	5.7%	3.5%
Other Finland	55.2%	43.1%
Transit	4.7%	2.7%
Not known	0.0%	0.8%

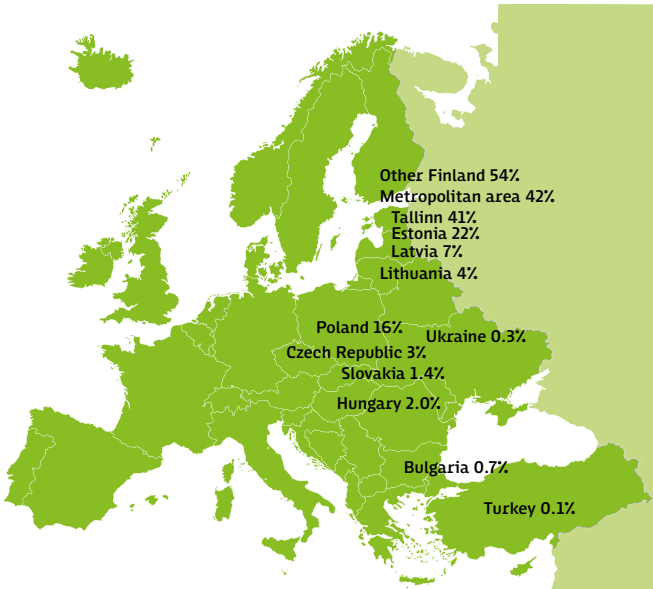
The origin/destination of the vehicles in Estonia or in Europe was

Europe	Helsinki (%) port to south, destination	Tallinn (%) port to north, origin
Tallinn	46.6%	33.9%
Other Estonia	16.0%	29.4%
Latvia	5.6%	8.2%
Lithuania	4.4%	2.6%
Poland	14.6%	18.3%
Slovakia	1.0%	1.9%
Czech Republic	4.4%	1.3%
Bulgaria	1.0%	0.3%
Turkey	0.2%	0.0%
Ukraine	0.5%	0.0%
Hungary	2.4%	1.6%
Other and not known	3.3%	2.4%

Share of European countries and areas of Finland of the number of Helsinki-Tallinn trucks, both ways in 2005



Share of European countries and areas of Finland of the number of Helsinki-Tallinn trucks, both ways in 2012



7.3 Conclusions

Seven years ago, at the end of 2005 Port of Helsinki carried out an interview among truck drivers in port of Helsinki. In 2005 172 000 trucks and trailers were carried between Helsinki and Tallinn, it was approximately 2/3 of 2011 volumes. The results showed that in 2005 64% of trucks were destined or originated from Estonia and rest 36% travelled to or from further south than Estonia. In Finland about one third of trucks remained in the Metropolitan area, one third in other part so South Finland County, and the rest further away in the other parts of Finland, mainly in western Finland.

Seven years later we can find that the number of vehicles transported to other parts of Europe has been the approximately the same. About 2/3 of trucks were destined or originated from Estonia and rest 1/3 travelled to or from further south than Estonia. Interestingly share of Poland has grown tremendously and in 2012 trucks are going further south, even down to Bulgaria and Turkey. In Finland about 42% of trucks remained in the Metropolitan area, and the rest in other parts of country.

We can also find out that industrial goods are both ways the most common goods to be transported and thereafter comes food and consumer goods. The traffic is mainly trucks pulling a semi-trailer and thereafter comes single unit trucks.

This study shows that the Helsinki-Tallinn cargo traffic lies heavily on business relationships between Finland and Estonia. In this study, the number of interviewed vehicles was so small that not all Eastern European countries show up in results. However, the importance of Poland and countries further south like Bulgaria and Turkey has grown.

REFERENCES

Strafica Oy, Helsingin-Talinnan välisen tavaraliikenteen määräpaikkatutkimus 2005, Helsingin sataman julkaisu A, 2006:1

HSL, Helsingin ja Tallinnan autolauttasatamien tavara-autoliikenteen tutkimus 2012, forthcoming

8. CO₂ Analysis of Helsinki-Tallinn Transportation Chains

*Olli-Pekka Hilmola (editor), Lappeenranta University of Technology,
Faculty of Technology Management, Kouvola Research Unit, Finland*

Completed study was team effort, and Prof. Hilmola was editing all parts together and adding some sections as well as clarifying and correcting completed data analyses. Research team consisted following persons: M.Sc. Marina Karamysheva (Russia), M.Sc. student Ida Norddal (Norway), Dr. student Milla Laisi (Finland), Dr. student Ville Henttu (Finland) and Emeritus Prof. Wladimir Segercrantz (Estonia/Finland).

8.1 Aim and methodology of the study

In a posteriori perspective sea transport between Helsinki and Tallinn has been huge success story. More than 7 mill. passengers, 1 mill. passenger cars and 0.25 mill. trucks were transported between these two sea ports in year 2011 alone. Due to this, combined passenger and freight ferries dominate the market, and basically ro-ro and container ships are within margin. Also every now and then railway based alternative (railship or railway tunnel) has been brought into discussion. However, until today ropax ferries have taken clear lead, and no other concept seems to be challenging it. This would of course be the case, if business environment would be kept as it has been for the last two decades. Due to year 2015 sulphur oxide regulation, future CO₂ emission requirements and dearer oil, we most probably will experience business model change in transportation chains.

The goal of this study is to examine and compare different transportation concepts between Helsinki and Tallinn in terms of their prices, costs, use of time, energy consumption, and CO₂ emissions (in this summary only CO₂ emissions are reported; entire study

see Hilmola, 2012). Five different transportation chains are being examined and compared: Waterborne transportation by ferry (ropax), ro-ro ship, container ship or rail-ship, and transportation via railway tunnel.

The comparison of different transportation chains is made by assuming that one has 200 units of cargo that are to be transported between the two locations. For each transportation concept, these 200 units of cargo can be loaded in semi-trailers and/or FEUs (forty feet equivalent unit container) in different combinations. All possible ways of loading are being studied for each transportation concept. For ferries, ro-ro ships and railships, this also includes loading a combination of semi-trailers and FEUs. When this scenario is examined, the share of cargo units allocated to semi-trailers and FEUs are the same ("complex" unit approach was used for calculations, which means that each unit consists of one FEU and one semi-trailer). The scenario of loading different cargo units on a vessel is not applied to container ships, as they can only be loaded with containers.

Ways to load cargo for different transportation concepts

Alternatives	Ferry (ropax)	Roro ship	Con-tainer ship	Railship	Railway tunnel
Semi-trailers, with cabin	X	X			
Semi-trailers, without cabin	X	X			
Semi-trailer on flatcar, with cabin				X	X
Semi-trailer on flatcar, without cabin				X	X
FEU			X		
FEU on platform, with cabin	X	X			
FEU on platform, without cabin	X	X			
FEU on mafi roll trailer, without cabin	X	X			
FEU on flatcar				X	X

For all transportation chains, both hinterland operations and the actual transportation process itself were studied.

8.2 Results: analyzing all possible combinations with most probable utilization level

We have analyzed altogether lowest and highest utilization rates and completed sensitivity analysis regarding to actual transportation task of each alternative in the study. However, this could be insufficient for practice. This due to the reason that in reality utilization of ships at e.g. Helsinki-Tallinn route will have fillrates falling between extremes of 30% and 80%. Therefore, in project with discussions of experts from the city of Helsinki, we decided to complete through analysis from competing transportation chains with utilization level of 50%. This is actually more or less in line with previous research work from Sweden, where shipping lines operating to Denmark and Norway were operating in level of 40–50% (anyway, utilization in many cases was just above 40%; see Styhre, 2010).

As was concluded in other analyses as well, in actual transportation process FEU container is unbeatable, and leads the entire evaluated spectrum of choices. However, semi-trailer without cabin difference is not that wide in this selected utilization level, and basically tradeoff with easier loading will in many cases make semi-trailer performance close or even better than container (please note that payload weight of semi-trailer was 2.84 tons lower in semi-trailer as compared to FEU). Interestingly mafi roll trailer is shown to be good in container transports, e.g. in case of ro-ro and ropax. This is due to the reason that mafi is 21 cm shorter than platform alternative carrying FEU.

Interesting is the finding that within 50% utilization scenario differences between transportation chains in CO₂ total emissions become somewhat lower (proportionally) as compared to lowest utilization level situation (30%). However, general findings still persist: Container ship is best alternative from all shipping based transportation chains, and ro-ro as well as ropax options emit two to three times more. Railship is showing highest pollution levels. It is of course so that within the entire alternative spectrum, railway tunnel beats all the shipping alternatives. However, it should be noted that altogether with assumed hinterland operations (train forming), semi-trailer is in 50% utilization case (shorter train) best performing option from railway tunnel chain alternatives.

Emissions (g of CO₂ per unit) of all transportation chain alternatives concerning main transportation task within Helsinki-Tallinn route as utilization is 50%

Transportation chain alternative		Actual transportation	
Vessel	Scenario	Sea or rail (v1)	Sea or rail (v2)
Roro	200 Semi-trailers with cabin	215767	239164
Roro	200 Semi-trailers without cabin	168769	190762
Roro	200 FEU on platform with cabin	208800	222556
Roro	200 FEU on platform without cabin	161818	174174
Roro	200 FEU on mafi roll trailer	160814	170468
Roro	100 Semi-trailers and 100 FEU on platform, with cabin	210766	228914
Roro	100 Semi-trailers with cabin and 100 FEU on mafi roll trailer	188774	205436
Roro	100 Semi-trailers and 100 FEU on platform, without cabin	164999	182091
Roro	100 Semi-trailers without cabin and 100 FEU on mafi roll trailer	165942	182091
Ferries (ropax)	200 Semi-trailers with cabin	277574	286687
Ferries (ropax)	200 Semi-trailers without cabin	222190	230942
Ferries (ropax)	200 FEU on platform with cabin	262784	268191
Ferries (ropax)	200 FEU on platform without cabin	203134	207848
Ferries (ropax)	200 FEU on mafi roll trailer	199178	202778
Ferries (ropax)	100 Semi-trailers and 100 FEU on platform, with cabin	269893	277131
Ferries (ropax)	100 Semi-trailers with cabin and 100 FEU on mafi roll trailer	238185	244527
Ferries (ropax)	100 Semi-trailers and 100 FEU on platform, without cabin	212098	218787
Ferries (ropax)	100 Semi-trailers without cabin and 100 FEU on mafi roll trailer	212472	218787
Container ship	FEU 500	75391	87438
Container ship	FEU	52690	62347
Railship 1	200 Semi-trailers on flatcar with cabin	843228	1335334

Transportation chain alternative		Actual transportation	
Vessel	Scenario	Sea or rail (v1)	Sea or rail (v2)
Railship 1	200 Semi-trailers on flatcar without cabin	496381	763048
Railship 1	200 FEU on flatcar	496069	763048
Railship 1	100 Semi-trailers with cabin and 100 FEU on flatcar	719153	890223
Railship 1	100 Semi-trailers without cabin and 100 FEU on flatcar	516026	728364
Railship 2	200 Semi-trailers on flatcar with cabin	394040	624001
Railship 2	200 Semi-trailers on flatcar without cabin	231959	356572
Railship 2	200 FEU on flatcar	231813	356572
Railship 2	100 Semi-trailers with cabin and 100 FEU on flatcar	336060	416001
Railship 2	100 Semi-trailers without cabin and 100 FEU on flatcar	241139	340364
Railway tunnel	200 Semi-trailers on flatcar with cabin	62339	
Railway tunnel	200 Semi-trailers on flatcar without cabin	38706	
Railway tunnel	200 FEU on flatcar	38649	
Railway tunnel	100 Semi-trailers with cabin and 100 FEU on flatcar	53324	
Railway tunnel	100 Semi-trailers without cabin and 100 FEU on flatcar	37893	

Emissions (g of CO₂ per unit) of all transportation chain alternatives concerning hinterland operations within Helsinki-Tallinn route

Transportation chain alternative		Hinterland operations				
Vessel	Scenario	Truck	RS,SC and SHC	STS	DLS	Form- ing of train
Roro	200 Semi-trailers with cabin	5862				
Roro	200 Semi-trailers without cabin	5862				
Roro	200 FEU on platform with cabin	8267				
Roro	200 FEU on platform without cabin	8267				
Roro	200 FEU on mafi roll trailer	1503	7980			
Roro	100 Semi-trailers and 100 FEU on platform, with cabin	7064				
Roro	100 Semi-trailers with cabin and 100 FEU on mafi roll trailer	3682	3990			
Roro	100 Semi-trailers and 100 FEU on platform, without cabin	7064				
Roro	100 Semi-trailers without cabin and 100 FEU on mafi roll trailer	3682	3990		831	
Ferries (ropax)	200 Semi-trailers with cabin	5862				
Ferries (ropax)	200 Semi-trailers without cabin	5862				
Ferries (ropax)	200 FEU on platform with cabin	8267				
Ferries (ropax)	200 FEU on platform without cabin	8267				
Ferries (ropax)	200 FEU on mafi roll trailer	1503	7980			
Ferries (ropax)	100 Semi-trailers and 100 FEU on platform, with cabin	7064				
Ferries (ropax)	100 Semi-trailers with cabin and 100 FEU on mafi roll trailer	3682	3990			
Ferries (ropax)	100 Semi-trailers and 100 FEU on platform, without cabin	7064				
Ferries (ropax)	100 Semi-trailers without cabin and 100 FEU on mafi roll trailer	3682	3990			
Container ship	FEU 500	6764	7980	807		

Transportation chain alternative		Hinterland operations				
Vessel	Scenario	Truck	RS, SC and SHC	STS	DLS	Forming of train
Container ship	FEU	6764	7980	807		
Railship 1	200 Semi-trailers on flatcar with cabin				7279	7406
Railship 1	200 Semi-trailers on flatcar without cabin				4732	7406
Railship 1	200 FEU on flatcar				3496	22497
Railship 1	100 Semi-trailers with cabin and 100 FEU on flatcar				8912	14952
Railship 1	100 Semi-trailers without cabin and 100 FEU on flatcar				7014	14952
Railship 2	200 Semi-trailers on flatcar with cabin				7279	7406
Railship 2	200 Semi-trailers on flatcar without cabin				4732	7406
Railship 2	200 FEU on flatcar				3496	22497
Railship 2	100 Semi-trailers with cabin and 100 FEU on flatcar				8912	14952
Railship 2	100 Semi-trailers without cabin and 100 FEU on flatcar				7014	14952
Railway tunnel	200 Semi-trailers on flatcar with cabin					7406
Railway tunnel	200 Semi-trailers on flatcar without cabin					7406
Railway tunnel	200 FEU on flatcar					22497
Railway tunnel	100 Semi-trailers with cabin and 100 FEU on flatcar					14952
Railway tunnel	100 Semi-trailers without cabin and 100 FEU on flatcar					14952

Denotation: RS (Reach Stacker), SC (straddle carriers), SHC (shuttle carriers), DLS (Diesel Locomotive Shunter), and STS (ship to shore crane)

Emissions (g of CO₂ per unit) of all transportation chain alternatives in total within Helsinki-Tallinn route as utilization is 50%

Transportation chain alternative		Total CO ₂ emissions			
Vessel	Scenario	Total (v1)	Hinter-land from total (v1)	Total (v2)	Hinter-land From total (v2)
Roro	200 Semi-trailers with cabin	221629	2,6%	245026	2,4%
Roro	200 Semi-trailers without cabin	174631	3,4%	196624	3,0%
Roro	200 FEU on platform with cabin	217066	3,8%	230822	3,6%
Roro	200 FEU on platform without cabin	170085	4,9%	182441	4,5%
Roro	200 FEU on mafi roll trailer	170297	5,6%	179951	5,3%
Roro	100 Semi-trailers and 100 FEU on platform, with cabin	217830	3,2%	235979	3,0%
Roro	100 Semi-trailers with cabin and 100 FEU on mafi roll trailer	196446	3,9%	213108	3,6%
Roro	100 Semi-trailers and 100 FEU on platform, without cabin	172064	4,1%	189155	3,7%
Roro	100 Semi-trailers without cabin and 100 FEU on mafi roll trailer	174445	4,9%	190594	4,5%
Ferries (ropax)	200 Semi-trailers with cabin	283436	2,1%	292548	2,0%
Ferries (ropax)	200 Semi-trailers without cabin	228052	2,6%	236804	2,5%
Ferries (ropax)	200 FEU on platform with cabin	271051	3,0%	276457	3,0%
Ferries (ropax)	200 FEU on platform without cabin	211401	3,9%	216114	3,8%
Ferries (ropax)	200 FEU on mafi roll trailer	208661	4,5%	212261	4,5%
Ferries (ropax)	100 Semi-trailers and 100 FEU on platform, with cabin	276958	2,6%	284195	2,5%
Ferries (ropax)	100 Semi-trailers with cabin and 100 FEU on mafi roll trailer	245858	3,1%	252199	3,0%
Ferries (ropax)	100 Semi-trailers and 100 FEU on platform, without cabin	219163	3,2%	225851	3,1%
Ferries (ropax)	100 Semi-trailers without cabin and 100 FEU on mafi roll trailer	220144	3,5%	226460	3,4%
Container ship	FEU 500	90942	17,1%	102988	15,1%

Transportation chain alternative		Total CO ₂ emissions			
Vessel	Scenario	Total (v1)	Hinter-land from total (v1)	Total (v2)	Hinter-land From total (v2)
Container ship	FEU	68240	22,8%	77897	20,0%
Railship 1	200 Semi-trailers on flatcar with cabin	857913	1,7%	1350019	1,1%
Railship 1	200 Semi-trailers on flatcar without cabin	508518	2,4%	775186	1,6%
Railship 1	200 FEU on flatcar	522062	5,0%	789041	3,3%
Railship 1	100 Semi-trailers with cabin and 100 FEU on flatcar	743016	3,2%	914086	2,6%
Railship 1	100 Semi-trailers without cabin and 100 FEU on flatcar	537993	4,1%	750330	2,9%
Railship 2	200 Semi-trailers on flatcar with cabin	408725	3,6%	638686	2,3%
Railship 2	200 Semi-trailers on flatcar without cabin	244096	5,0%	368710	3,3%
Railship 2	200 FEU on flatcar	257806	10,1%	382565	6,8%
Railship 2	100 Semi-trailers with cabin and 100 FEU on flatcar	359923	6,6%	439864	5,4%
Railship 2	100 Semi-trailers without cabin and 100 FEU on flatcar	263105	8,3%	362330	6,1%
Railway tunnel	200 Semi-trailers on flatcar with cabin	69745	10,6%		
Railway tunnel	200 Semi-trailers on flatcar without cabin	46112	16,1%		
Railway tunnel	200 FEU on flatcar	61147	36,8%		
Railway tunnel	100 Semi-trailers with cabin and 100 FEU on flatcar	68275	21,9%		
Railway tunnel	100 Semi-trailers without cabin and 100 FEU on flatcar	52844	28,3%		

What should be noted from this detailed analysis from all possible alternatives, is the performance of hinterland operations regarding to semi-trailers. As these are loaded horizontally (even using polluting truck diesel engine), the overall result is comparatively good performance. Of course our hinterland operations assumptions are maybe too harmful for e.g. containers as we assume that ship-to-shore crane is electricity powered and other devices are using diesel engines. Container transportation chains could do a lot by applying rigid practices of using only electricity power. Also automation and direct loading to transportation device should be further developed (without intermediate storing, which requires additional container movements).

8.3 Conclusions

If very short sea shipping transportation chains of this research work, and basically the connection between cities of Helsinki and Tallinn would be observed by other than Finns or Estonians, this connection would not be seen as important at first glance. However, significant development in these two economies, amount of passengers traveling and also freight flows between these two near-by sea ports make it interesting and important. As environmental demands are getting increasingly tighter in the future, it means that road transports and short sea shipping methods and use will change tremendously. Basically it is so, that emissions management, and particularly CO₂ minimization becomes first priority. This is because of the fact that fuel consumption goes hand in hand with CO₂ emissions. Currently we have only used to pay from consumed fuel, but in the future we shall most probably pay from emitting CO₂ as well. As fuel costs in e.g. shipping and road transport are already high and take proportionally very significant proportion from overall costs, it is inevitable that most competitive transportation chains of tomorrow will be focusing on emission minimization and green issues. This not necessarily for the reason that companies would be interested and eagerly willing to take into account green issues, but because these have so huge impact on competitiveness and profitability.

If transportation chains would be evaluated only with CO₂ emissions and energy efficiency within Helsinki-Tallinn route, then clearly all solutions around containers carrying cargo would be better than others. This also means that putting inside of sea vessel semi-trailers with cabins is not wise, as they take space and add more non productive weight (main practice of today, semi-trailer with truck on ropax ship). Within sea transportation based chains, best performance is clearly in container ship, and worst in rail-ship. Latter for the reason as so much unproductive weight is on a ship. Roro and ropax are performing between these two extremes, where roro is a bit better than ropax. Of course, if railway tunnel option is included in evaluation, then best performance arises from it. It should be noted that both, container ship and railway tunnel transport do have as one of the greatest improvement area loading and unloading operations, not necessarily actual transportation.

As further research we would be interested to follow and build scenarios for different changes taking place in the post year 2015 world. Also seeing upcoming changes in post year 2020 world would be interesting research area too. Environmental pressure is on, and oil prices have increased very significantly in last decade perspective. Forthcoming changes in transportation chains are going to affect also industrial and warehousing structure, not only in Finland, but all a bit distant countries from Central Europe. Also in Finland, Sweden, Norway and Russia, huge interest and significant development / investment activity is placed on northern areas. However, raw materials taken from north need to end also somewhere – most probably to European factories. It is not entirely out of question that these products would not be put into containers (e.g. special sea containers, twenty feet long, but having higher payload) – as open question reminds, from where these containers shall flow to Europe, and what is the main hinterland transportation mode. This modal choice will affect sea based alternatives used.

REFERENCES

Hilmola, Olli-Pekka (2012). Competing Transportation Chains in Helsinki-Tallinn Route: Multi-Dimensional Evaluation. Lappeenranta University of Technology, Faculty of Technology Management, Kouvola Research Unit, Research Report 243. Lappeenranta, Finland

Styhre, Linda (2010). Capacity Utilization of Short Sea Shipping. Doctoral Dissertation. Chalmers University of Technology, Göteborg, Sweden.

ECONOMIC STUDIES



9. The effect of business on mobility between Helsinki and Tallinn

Harli Uljas, BDA Consulting

9.1 Aim and methodology of the study

The aim of this study was to obtain an overview of Estonian-Finnish business dynamics and its current situation as well as the impact of business integration on the mobility of people and cargo between Tallinn and Helsinki.

The first part of the study comprises desk research for collecting and analysing statistical information about Finnish companies in Estonia (incl. separately in the Tallinn region) and Estonian companies in Finland (incl. separately in the Helsinki region).

The analysis contains the following information:

- the number of companies;
- the number of people employed in these companies;
- the main fields of business of the companies;
- the sales revenue of the companies;
- the investments made by the companies.

The second part of the study comprises in-depth interviews with the managers of the major/more important companies. The interviews were conducted with 18 people, in total. The topics of the in-depth interviews were as follows:

- how and in what volume do business goods and people move between Estonia and Finland;

- how has the mobility of people and the movement of goods changed over time; what changes can be expected in the future;
- what are the driving forces and obstacles in the further integration of business between Tallinn and Helsinki;
- what are the expectations towards the development of the business and social environment in Tallinn and Helsinki, incl. legislation.

9.2 Results of the statistical analysis

Estonian companies in Finland

For Estonian companies, expansion to the Finnish market is an important step in increasing business volumes. Finland is both geographically and culturally close and the market is almost 4–6 times larger than the Estonian one. Thereby, turnover can be expected to increase, the productivity of existing investments to improve and competitiveness to increase due to the larger returns to scale.

Below (chart 1) is an overview of data from Finnish subsidiaries of Estonian companies. It must be kept in mind that most of the companies selling from Estonia to Finland still do not make use of the existence of a local subsidiary but sell products through the Estonian company. This is why it only reflects one (more active) part in the activity of the Estonian companies.

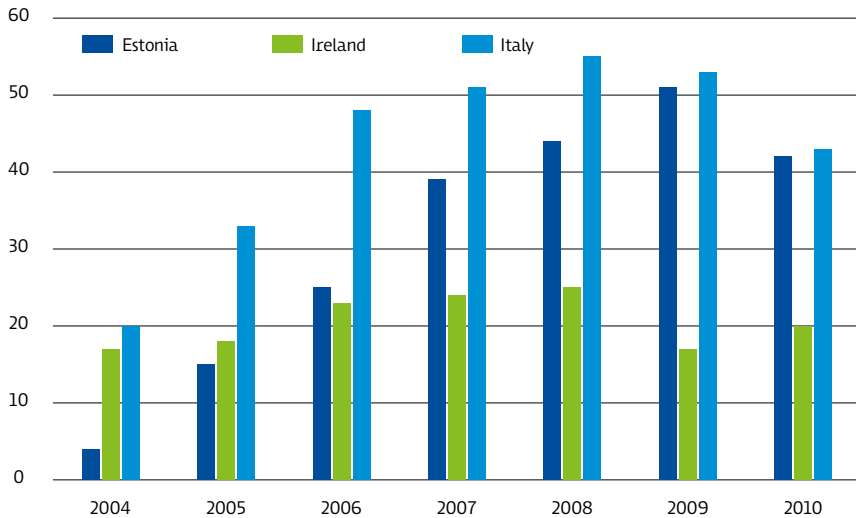
It is also practical to compare the Estonian companies in Finland with companies from other countries to gain a better understanding of the potential reasons for various changes. Potential comparable countries could be countries that are as close in their essence to Estonia as possible or countries for which the Finnish market is not of prime interest to them due to its distance, which is why activities aimed at the market are less fulfilled.

Estonian companies became interested in the Finnish market around 2005, although Estonia was also undergoing a period of fast growth at that time. From 2005 to 2010, the number of companies increased almost threefold.

Based on the accumulated data, Estonian companies are relatively small compared to companies from other countries operating in Finland, based on different comparative assessments. At the same time, turnover per employee is actively approaching that of the EU27 companies, though still remaining slightly behind it.

The investments made by Estonia into Finland are remarkable, however, as they only make up a fraction of the investments made by Finland into Estonia. The average investment volume per company is almost 4–6 times smaller than that of the countries taken as a basis for the comparison (EU27 companies).

Number of Estonian, Irish and Italian subsidiaries in Finland (2004-2010)



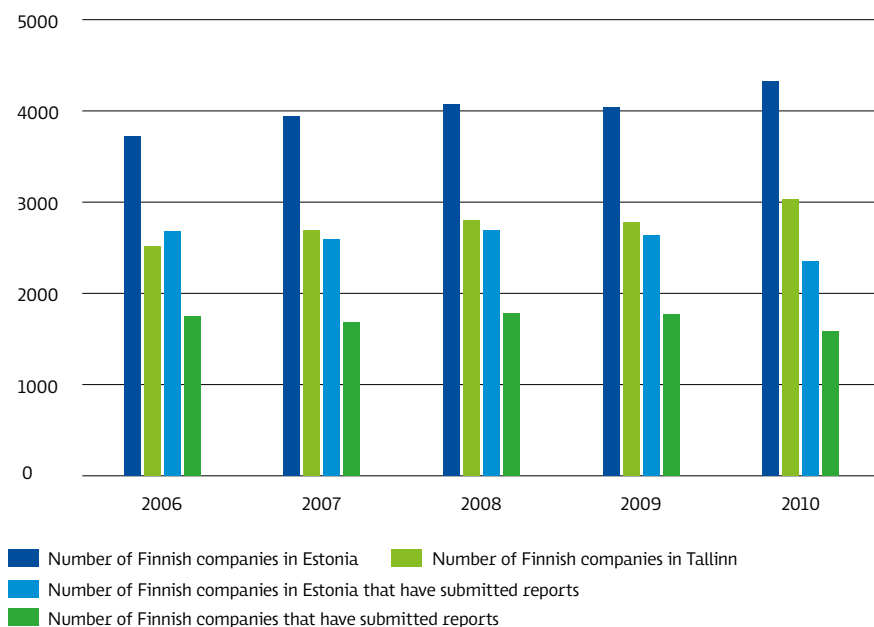
Finnish companies in Estonia

There were almost 60,000 companies established in Estonia by the end of 2010. Of these, 4,319 were enterprises from Finland. At least half of the Finnish enterprises were active and have submitted the annual reports (chart 2). In 2010, approximately 28,000 people were employed in these enterprises.

The following conclusions about Finnish enterprises operating in Estonia can be made based on data analysis from various sources:

- They have a larger average turnover and workforce than Estonian enterprises.
- On the basis of the data from the Centre of Registers and Information Systems, Finnish enterprises work with higher indicators than Estonian enterprises (e.g. turnover per employee).
- Finnish enterprises look beyond Tallinn in Estonia, although 60% of the enterprises are located in Tallinn.
- In comparison with enterprises from Sweden or the EU, Finnish enterprises are more focussed on offering local products/services for the domestic market in Estonia – their share of export is lower.

Number of enterprises with Finnish owners in Estonia and Tallinn (2006-2010)



- Larger Finnish enterprises (more than 20 employees) are more similar to Estonian enterprises in terms of their efficiency indicators than with Swedish enterprises that provide higher added value.

9.3 Results of the interview study

The interviews were conducted with 18 people, in total. Estonian companies see the attitudes of buyers in Finland towards Estonia as being based on the principle that one is dealing with a workforce from a cheaper country and with cheaper products when it comes to Estonian businesses. The traders have sensed a certain attitude of superiority. Also, buying from Finns is preferred when possible. However, insecurity in the economy has reduced this attitude somewhat, since people are being more mindful of their spendings.

Finnish companies view the Estonian environment with certain trepidations relating to legislation; it may change suddenly without extensive debate, weak local governments are unable to have their say even if they are interested in investing, and the high level of inequality and huge gaps between different levels of society cause a great imbalance.

The Finnish planning process seems very long to Estonians due to numerous consultations; an Estonian would like to get it done quickly and see what happens. Although Finnish businesses have invested in Estonia because competitiveness has become or is becoming a problem, simple business opportunities in Estonia have helped Finnish businesses remain competitive by coming to the neighbouring country.

The key conclusions from the interviews include the following:

- The Finnish market is very close but at the same time it is also relatively closed to Estonian enterprises. Operating there requires longer planning and, when it comes to potential clients, also overcoming prejudices. At times, Estonian enterprises operating in Finland are also frustrated by the Finnish labour regulations.
- Estonian enterprises operate in Finland in a similar sector as in Estonia, which can be a little bit different depending on the kind of enterprise that has been purchased there.
- For Finnish enterprises, the Estonian market is like an extension of their home market, with the production capacity serving other regions, too, in addition to the local consumers. Enterprises with Finnish interests have integrated well into the Estonian economy, operating in the same sector as in their home market.
- Estonia and Finland complement each other – the Finnish thorough consideration and planning versus the Estonian readiness to risk and test.
- Estonia has also helped Finnish enterprises to improve their competitive position thanks to a more favourable and more liberal business climate, a part of which is the lower cost of labour.
- As the economies integrate, the movement of people and goods will increase; the higher fares on ferries have not gone unnoticed by those using that service, yet there is appreciation for having the option to cross the Gulf of Finland in just two hours. Drivers are frustrated by the long drive out from the harbours in Tallinn and Helsinki.
- The various transport links (ferries, including the various ticket classes, planes, and helicopter) meet the needs of the various consumer groups – the availability of all of them is important to the respondents.
- Integration requires “image management” at both ends – presenting Finland and Helsinki as locations for cultural events and holidays to Estonians, and presenting Estonia as a land of positive attitudes and modern technology to Finns.

9.4 Summary

Below are the most significant conclusions drawn from the statistics and interviews collected.

Based on the statistics collected, the Estonian companies are relatively small compared to companies from other countries operating in Finland. At the same time, the turnover per employee is actively approaching that of the EU27 companies, though still remaining slightly below it.

The investments made by Estonian companies in Finland are significant; however, they only make up a fraction of the total investments made by Finnish companies in Estonia. The average investment volume of a company from Estonia is almost 4–6 times lower than that of the countries taken as a basis for the comparison.

Today, Finnish companies in Estonia are a natural part of the economy – one of the reasons for this is that Finnish companies have purchased companies in Estonia that operate in exactly the same field as the parent company in both Finland and the rest of the world. The turnover and workforce in Finnish companies in Estonia is above average.

Serving the Estonian domestic market is the main focus of these companies; the proportion of exports in total turnover is almost 2 times lower compared to Swedish companies (this may be caused by the significant effect of just a few Swedish companies on the statistics (Elcoteq, ABB)).

From the interviews, it appears that the Estonian market is considerably more open for Finnish companies than the Finnish market for Estonian companies. In Finland, the problems lie in isolation, division of the market, labour relations and prejudices against the Estonian operator and their products/services. Estonian companies operating in Finland have a rather long-term perspective in mind. Finnish subsidiaries have been acquired when good opportunities present themselves and Estonian companies are waiting for better market conditions and greater understanding of the market. A Finnish subsidiary of an Estonian company operates in a slightly different direction than the parent company in Estonia.

By means of a branch located in Estonia that is managed relatively independently, other regions are also served in addition to the local consumer.

Estonia and Finland complete each other – Finland provides thorough consideration and planning, Estonia provides a risk appetite and testing. Estonia has helped Finnish companies to improve their competitive position due to the more favourable and free business climate; lower labour costs are a part of this.

As economies integrate, the mobility of people and the movement of goods keep increasing. Sea transport users have noticed the higher price of maritime connections; at the same time, the option of crossing the Gulf of Finland in just two hours is highly appreciated. Car travelers are disturbed by the time-consuming exit routes from the ports in Tallinn and Helsinki.

Various transport connections (ferries (incl. various ticket classes), airplanes, helicopter) satisfy the needs of the different consumer groups; the existence of all of these groups was significant for the respondents.

REFERENCES

Uljas H. & Karotamm, L. (2012). The effect of business on the mobility between Helsinki and Tallinn, BDA consulting.

10. Economic flows between Helsinki and Tallinn regions

*Seppo Laakso and Eeva Kostainen, Kaupunkitutkimus TA Oy and
Tarmo Kalvet and Keijo Velström, Tallinn University of Technology*

10.1 Introduction

The main objective of this study is to specify and estimate the magnitude of the main economic flows between Helsinki-Uusimaa and Tallinn-Harju regions. Many of the various cross-regional flows have been specified and a lot of data has been published about them in the other sub-projects of H-TTransplan. This study aims at complementing the other studies by finding out the monetary value of the main flows and in addition, to estimate and evaluate the indirect economic effects and the significance of the whole from the point of view of broader regional economy.

The focus is in the following economic flows:

- tourism between Tallinn-Harju and Helsinki-Uusimaa
- cross-region work between the regions
 - short time or periodical work without permanent residence
 - permanent work based on residence in the same region (immigration)
- cross-region activities of enterprises from SMEs to multinational corporations.
(Not covered in this summary.)

Another objective is to present a framework of the integration process of a cross-border region, based on research literature and studies from other regions where two or more closely located urban regions in different sides of the border proceed in economic integration. The results of the economic flows between Tallinn-Harju and Helsinki-Uusimaa regions are linked with and interpreted in connection with this framework.

Tallinn-Harju region refers to Harju county and Helsinki-Uusimaa region to Uusimaa county.

10.2 Cross-border regions in research literature

In the literature of border studies, the globalization of economic and cultural exchange, the diminishing of the relative role of the nation states and the processes of regional integration has been seen to have led to profound political and economic territorial reorganisation, especially in the European border regions. This has been interpreted in terms of integration, as a process of intensification of the exchange of goods, services, capital, knowledge and people between distinct territories. However, it has been demonstrated, that the development of cross-border economic relations does not necessarily lead to reduction in disparities or increase in territorial cohesion between the regions: relations between regions can be highly asymmetrical and based on significant differentials. And vice versa, a process of convergence does not necessarily imply that significant flows are exchanged across the borders; the homogenization may be the result of internal dynamics of each area. Even when cross-border regions form large functional units, the legal and regulatory frameworks, labour market, housing and transport policy remain heavily influenced by national systems. (Decoville, Durand, Sohn & Walther, 2010.)

Cross-border areas can be defined as territories that do not correspond to administrative definitions of region since they extend both beyond regional administrative borders and national borders. Contiguous cross-border areas consists of a limited set of neighbouring regions from at least two countries that have adjacent borders and cover a restricted space, smaller than an average country. These cross-border areas often have a long history and sometimes they represent historical regional definitions. Due to their proximity, the area may show similarities in economic development and culture or share a similar peripheral situation in their respective countries. Contiguous cross-border areas can be defined as functional regions. A functional region is a territory sharing commonalities and linkages that create interdependencies and cohesiveness, that distinct it from other regions. Functional economic regions are characterized by density of economic linkages: trade flows, shopping movements, mobility of labour force. The boundaries of functional region often differ from those of a formal region, defined as a political entity by laws and institutions. The worker mobility patterns are the most widely used indicator for defining functional regions: functional regions show a high rate of internal commuting and self-contained job search patterns. (OECD, 2012.)

The development of a fully integrated functional region as a multi-faceted phenomenon requires integration in three main dimensions: economy, physical infrastructure and socio-cultural life. In addition, an overarching vision for the future of the cross-border region and good governance conditions are needed, too. Cross-border innovation is only one element of economic integration for a successful knowledge-based functional region, but of growing importance. The Cohesion Policy of the EU has played an important role

in the development of cross-border areas in the EU. The project of creating a borderless economic space has stimulated cross-border co-operation in many parts of the continent. Several cross-border co-operations were initiated by the first INTERREG I programme (1990–1993) in the old core of Europe. Subsequent INTERREG (II–IV) programmes have provided continuous support to cross-border co-operation arrangements and injected necessary funding to kick-start new partnerships. The more recent set of areas of cross-border collaboration include examples with an unbalanced profile: they gather the strong but slow growing regions from old member states and the catching-up regions from new member states. (OECD, 2012.)

According to the widespread agreement in academic literature in the emerging globalized knowledge economy all regions', including cross-border regions', long term competitive strength rests on their capacity to create an integrated innovation space. The view is shared by European policymakers that promote cross-border integration and in line with the intention of the Lisbon treaty to create dynamic and competitive knowledge based economy. However, this may not be reachable for the majority of cross-border regions in Europe, since many of them are not characterized by collective learning systems or by socio-cultural and institutional proximity that are viewed as important prerequisites for successful localized innovation systems, but are embedded in different national and regional innovation systems. (Lundquist & Tripp, 2009.)

European cross-border regions show considerable variation in basic geographical pre-conditions in terms of scale, size and location engendering primary restrictions of what kind of integration is likely to occur and what types of benefits are possible to reap from different integration processes. In addition, many cross-border regions have very different economic histories, technological trajectories and innovation capacities, institutional set-ups and positions in the regional system of their respective nations, social dynamics, political visions, governance structures, modes of regulations and cultural identities. To a certain degree the differences in economic structure, innovation capabilities and cost structure create the foundation for cross-border growth, the potentials to reap benefits from unexploited complementarities and synergies. Simultaneously, as some of the differences create the main driving force for cross-border growth, they also form barriers hindering successful integration. (Lundquist & Tripp, 2009.)

Regulatory and administrative barriers hamper collaboration for many cross-border activities, also on innovation. Despite the EU, the differences in regulations and administrative provision from one country to another still create difficulties for mobility of goods, services, people and capital and for the development of joint action. In the knowledge-based economy, where talent is the main resource, barriers to the mobility of people play an important role. The complexity of arrangements involving organisations and individuals subject to different legal and administrative rules involves administrative burden, delays and costs. Also cultural differences including language differences entail communication costs and thus create barriers to collaboration. Cultural barriers impede the development of trust-based relationships, which is an important component in innovation co-opera-

tion. In addition competition, usually acknowledged as an important driving force for innovation, may prevent the exploitation of useful co-operation opportunities. The fear of losing market shares or dominant positions might make it difficult for the actors in the cross-border area to identify the potential for co-operation. The benefits from cross-border development opportunities generated by complementarities between different innovation potential and resources over borders need to be substantial and visible to overcome the costs and hindrances created by the differences across the area. Exploiting the potential offered by the “right” level of proximity between the parts of the cross-border area is a key success factor. (OECD, 2012.)

Certain degree of functional proximity, relational proximity and spatial proximity is needed for the emergence of an integrated cross-border innovation space. Functional proximity refers to the differences of innovation capabilities and receiver competence between the regions. Big differences in innovation performances is a hinder for easy knowledge flow between areas and a strong asymmetry will limit the opportunity for mutual advantages of integration. Relational proximity is associated with the structures, relations and processes that originate from social dynamics, governance structures, regulation and cultural identities and it refers to shared norms, institutions and regulations, mutual understanding, trust and codes of conduct and shared organizational and technological cultures for collaboration patterns and knowledge exchange. The cognitive dimension of relational proximity refers to the optimal balance between the closeness of knowledge bases, technical and organizational know-how for efficient cooperation and difference for learning something new and exploiting new complementarities. The institutional dimension reflects the differences in formal and informal institutions. Spatial proximity can facilitate relational proximity, but in some cases relational proximity can emerge totally detached from spatial proximity; in some cases more fruitful relations could be found elsewhere than across the border. The regions’ embeddedness in existing and historically evolved innovations systems and the importance of other international relations in the global arena will influence the character of new potential cross-border linkages. (Lundquist & Trippel, 2009.)

Lundquist and Trippel (2009) have built a conceptual framework focusing on the different types of proximity describing three stages of the rise of transfrontier innovation system: weakly integrated, semi-integrated and strongly integrated. Cross-border areas in stage I are characterized by a low level of cross-border economic relations in general and a lack of knowledge interactions and innovation linkages. The existing integration is dominated by asymmetric cost-driven linkages that mainly exploit internal price and cost differences. Lack of synergies or unexploited synergies could lead to this situation. Cross-border areas in stage II can be referred to as emerging knowledge driven systems. Asymmetrical cross-border links and flows still dominate, but asymmetry is decreasing and new, more mutually beneficial linkages are opening up. “Islands of innovation” occur in narrow segments of the science base and economic structure where good levels of cognitive and functional proximity were found. This interaction still takes place between distinct regional innovation spaces embedded in their national innovation spaces, and the cross-border

linkages are of subordinate importance for the overall innovative performance on both sides of the border. Stage III represents the most advanced and final form of innovation-driven integration, where distinct regional innovation spaces have ceased to exist and become more and more melted into a single one. It is characterized by a considerable flow of knowledge, expertise and skills across the border that forms the central underpinning of the innovation performance of the cross-border region. (Lundquist & Trippel, 2009.)

10.3 Framework of cross-border regional economic flows

Tourism

From economic point of view tourists visiting a place or region are consumers who consume various services, like transport to and in the region, accommodation, restaurants and cafes, culture and leisure services and buy goods (shopping). They pay for the goods and services and this creates the monetary flow from the source region where tourists live to the target region. The income from the tourists is distributed between the industries involved and part of it is channelled to the salaries of the workers in the industry. This income increase caused by tourism is channelled further to the regional economy via purchases of goods and services. Moreover, the direct flows are followed by other flows caused by links of the tourist industry to other industries within the region or in other regions. These additional flows are indirect economic effects which enhance the total economic effect of the tourism.

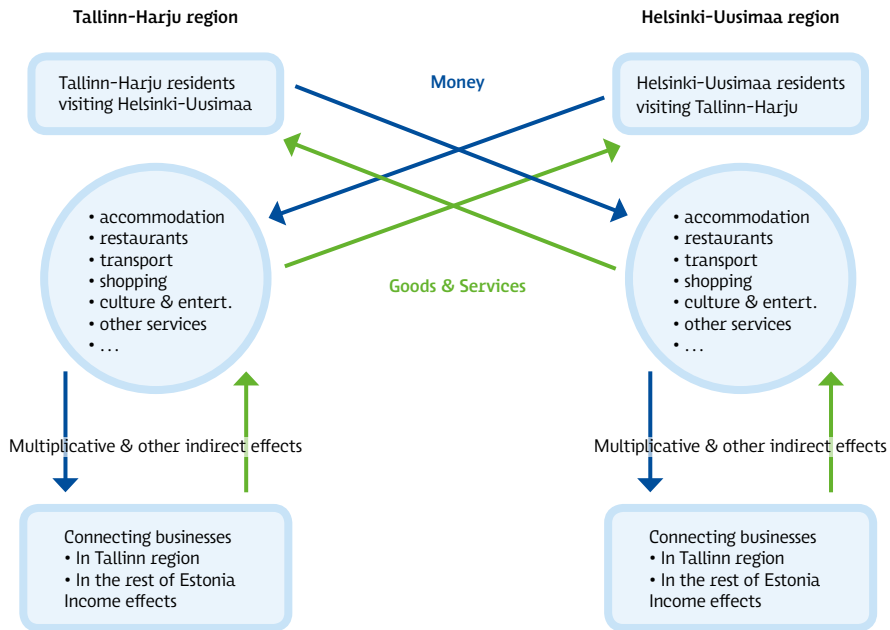
Cross-region work

The cross-region flows connected with labor markets are closely connected with the production of enterprises and public sector organizations. Labor is one of the key production factors of those organizations and salaries and other personnel costs constitute a significant cost for them.

Cross-region work can be divided to two cases (illustrated in the second figure for people working in Helsinki-Uusimaa). First, there are the people who work permanently in Helsinki-Uusimaa and have moved from Tallinn-Harju and have become a resident there. They work normally for the employee having an establishment in Helsinki-Uusimaa. The employee can be a Finnish, an Estonian or an international firm or a Finnish public sector organization. Second, there are people who work temporarily in Helsinki-Uusimaa but are residents in Tallinn-Harju. They can commute on weekly basis or spend longer periods working and living in Helsinki-Uusimaa. In their case the employee can be as in the previous case but it can also be an Estonian firm without an establishment in Helsinki-Uusimaa (eg. labor renting).

In both cases the worker gets salary from the employee as a compensation for work input. This salary income (net after taxes and income transfers) is used for consumption or

Economic flows from cross region tourism

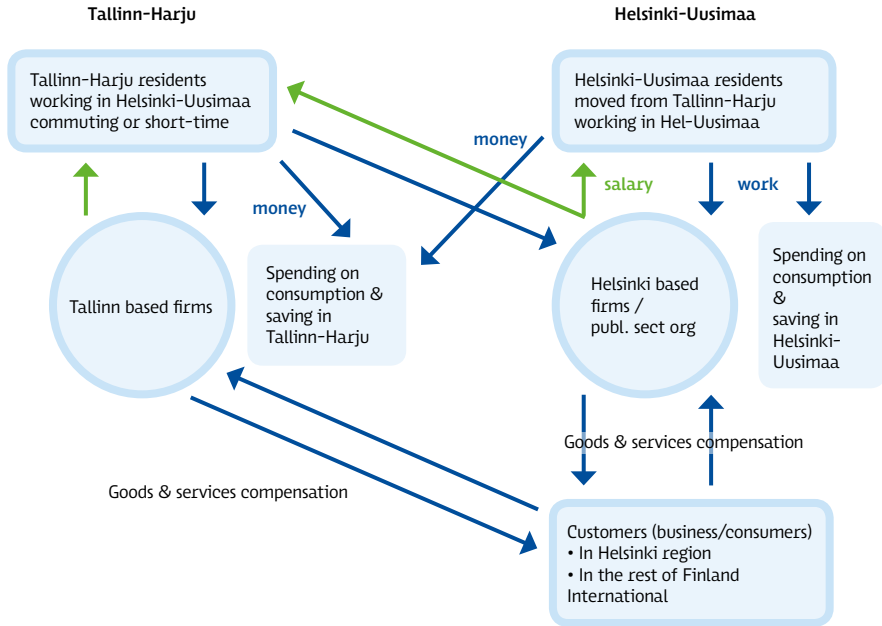


saving. In cross-region work it is typical that the spending (and saving) is divided between the work region and residence (present of previous) region. The spending based of income connected with cross-region work creates direct and indirect economic effects on the economy in the regions where the spending is targeted.

10.4 Estimations of cross-border regional economic flows between Tallinn region and Helsinki region

According to the initial results income to the Tallinn-Harju tourist industry from Finnish tourists, of which a significant share come from Helsinki-Uusimaa, was about 260 M€ in 2011. Finnish tourists' share of all tourists in Tallinn-Harju is approximately 60%. Tourism has become a big industry in the Tallinn-Harju region and the contribution of tourists from Helsinki-Uusimaa makes a significant contribution on that.

Economic flows of cross-region working case: from Tallinn-Harju to Helsinki-Uusimaa



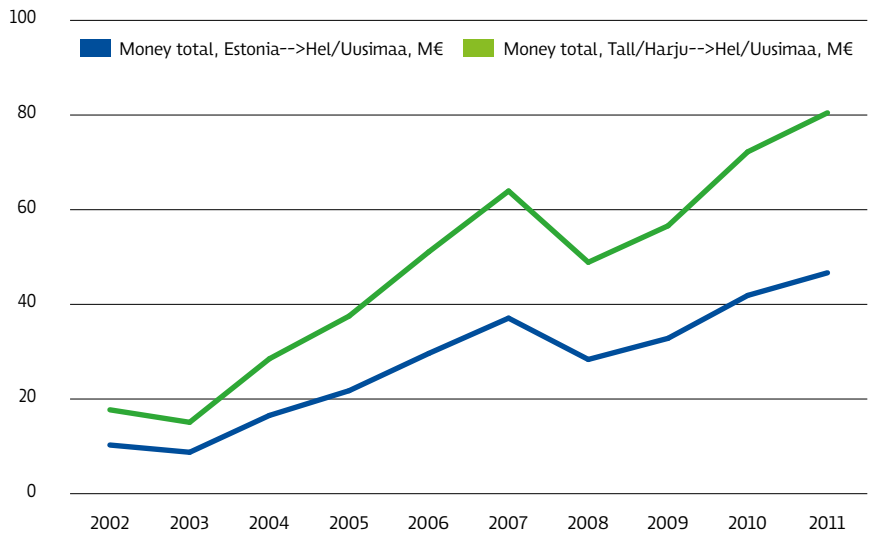
The money flow from Estonian tourists to Helsinki-Uusimaa is approximately 80M€ of which the share of Tallinn-Harju residents is estimated to be about 60%. The tourism and money flow from Estonia and Tallinn-Harju has quadrupled in ten years while the growth has been smaller in the other direction. However, the monetary value of the tourism from Estonia to Helsinki-Uusimaa is only a third of that to other direction. On the other hand, relative to population and purchasing power the Estonian flow to Helsinki-Uusimaa is larger than to the opposite direction.

According to the initial results the economic flows connected with cross-border work are significantly bigger than those of tourism. It has been estimated that the gross earnings of people from Tallinn-Harju working in Helsinki-Uusimaa (both residents and short-time workers) were about 300–400M€ in 2011. Approximately one half of the sum is earned by residents in Helsinki-Uusimaa moved from Tallinn-Harju and a half by temporary workers who are residents in Tallinn-Harju. This income (after taxes and income transfers)

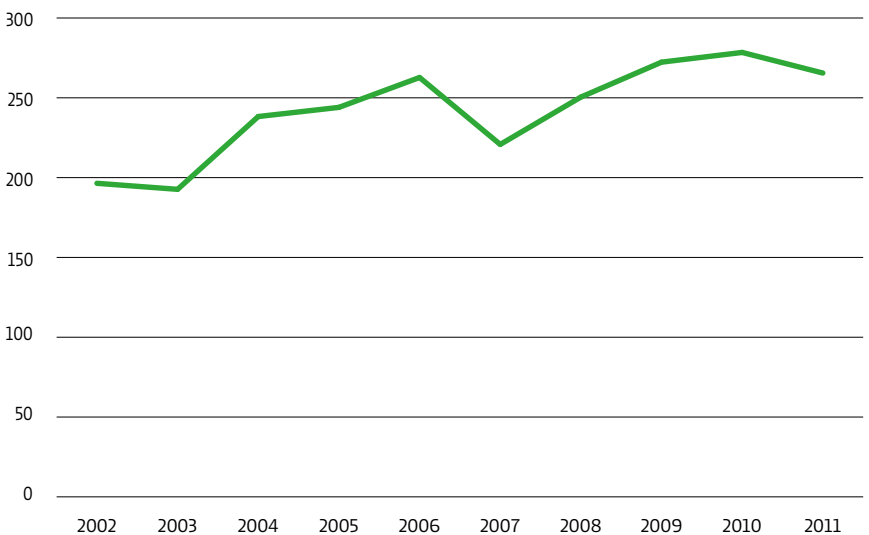
Economic flows from cross region tourism initial results

Money spent (M€) by tourists (excluding work-based visitors)

From Estonia / Tallinn-Harju to Helsinki-Uusimaa



From Finland to Tallin-Harju



is divided into consumption and saving between Tallinn-Harju and Helsinki-Uusimaa (plus a leak outside these regions) but estimations about this division is not yet available.

There is a major income flow also to the other direction by Finnish people working in Tallinn-Harju with residence there (immigrants) or in Helsinki-Uusimaa (temporary workers). These estimations are not yet available.

10.5 Tallinn and Helsinki as an integrated cross-border region

There is increasing cross-regional economic interaction between Tallinn-Harju and Helsinki-Uusimaa regions in terms of trade of goods and services, cross-border activities of enterprises, transport, tourism and cross-region work. All of these activities create significant economic flows which are linked with each other between the regions.

The economic flows are an essential part of economic integration between the regions and there is no doubt that the growth of the flows during the last 10 years has benefited both regions. However, there are significant asymmetries in the present flows. The monetary flow of tourism is approximately three times larger from Helsinki-Uusimaa to Tallinn-Harju than to other direction, in spite of the fact that relative to population and purchasing power the flows are quite well in balance. The majority of the demand base of tourism industry in Tallinn-Harju comes from Finland. However, there is no reason to see this asymmetry as a problem but rather an indication of different specialization structures.

Another asymmetry is connected with cross-region work where the labor flow from Tallinn-Harju to Helsinki-Uusimaa is significantly larger than to the other direction. Estonian workers (permanent and short-time) have a crucial role in the labour markets of Helsinki-Uusimaa and the functioning of some industries is already crucially dependent on this flow. This situation contains a risk of shortage of labour in Tallinn-Harju and whole Estonia, at least in certain industries, like health services. In this case the asymmetry may lead to imbalance on labour market at the same time when cross-region work benefits both regions with other respects.

The analysis of the economic flows gives also indication of the position of Tallinn-Harju and Helsinki-Uusimaa in the integration process. It is evident that the differing specialization structures as well as price and salary level differences have been drivers of the integration during the last ten years. However, it is an open question how intensively the regions and the different actors in both region have used the social, organizational and innovation related potentials and opportunities to create new complementarities.

REFERENCES

Decoville, A. & Durand, F & Sohn, C. & Walther, O (2010) Spatula integration in European cross-border metropolitan regions: A comparative approach. CEPS/INSTEAD Working Papers 2010-40.

Lundquist, Karl-Johan and Trippel, Michaela (2009) Towards Cross-Border Innovation Spaces. A theoretical analysis and empirical comparison of the Öresund region and the Centrop area. SRE - Discussion Papers, 2009/05. Institut für Regional- und Umweltwirtschaft, WU Vienna University of Economics and Business, Vienna.

OECD (2012) Cross-border regional innovation policies. Draft for discussion at workshop 10-11 September 2012.

Statistics Finland

CONCLUSIONS



11. Integration scenarios

Erik Terk, Estonian Institute for Future Studies

11.1 Introduction

The goal of the building of the following scenarios was to outline the possible variants for the analysis of integration of the capital city spaces under observation, dependent on the most significant internal and external factors. Particular attention in the building of the scenarios was paid to the development of transportation systems, including the possible impact of the Rail Baltic (Tallinn-Warsaw) direct rail link on the dynamics of situation of the two capitals (Helsinki and Tallinn). The influence of transportation projects on the Helsinki-Tallinn situation is multi-faceted: first of all, well-functioning and moderately priced transport connections are a vital factor in the cities' integration; secondly, long-distance transport connections (incl. cargo) can significantly boost the economic growth of the entire region; thirdly, the options for the development of transport hub terminals etc. are closely related to other aspects of urban space development.

The main backgrounds for the scenario building were the general economic growth in the region and the functioning of the EU, the changing ecological standards and possible changes in lifestyle. The capitals' preferred policies regarding urban planning and cross-border cooperation are important elements of the scenarios, which also outline their differences.

The scenarios were constructed by special working groups of transport and planning specialists and stakeholders from Helsinki and Tallinn in the September 2011-May 2012 time period. The final texts were prepared by researchers of the Institute for Futures Studies of the Tallinn University – Erik Terk, Jüri Sakkeus and Aado Keskpai.

The scenarios as well as their background explanations and comments were also published in June 2012 in the booklet "Twin-city in the making. Integration scenarios for Tallinn and Helsinki capital regions" (Terk, 2012).

The scenarios served in this project as input for further stages of the work: the forming of a joint vision of Helsinki-Tallinn transport and planning activities, assessing the territorial impact of possible changes and drafting a roadmap of concrete actions.

11.2 The underlying logic of the scenarios' construction

We have selected two main axes to serve as basis for the building of the scenarios. These are, firstly, the expected economic growth in European economy, and, secondly, the motivation for and capability of cooperation of the Estonian and Finnish actors. As actors we mean the subjects operating at the national and local government level, as well as all other significant subjects on whose activities the success of the cooperation projects would depend. The option of selecting the state and capability of the EU as one of the main axes was discussed as well, since the development and integration of the Helsinki-Tallinn region will quite greatly depend on it, especially on the EU's motivation and capability to support the realisation of large infrastructure, incl. transport-related projects (e.g. the Rail Baltic railway project and in the future possibly the undersea tunnel project). However, it was eventually agreed upon that the state of the EU and its ability to support such projects will depend to a very great degree on the general economic situation in the world and in Europe. Therefore it was not used as a separate axis, but the positive economic environment scenarios presumed the continued existence of the EU and the continuity of its policies.

In case of the second axis, i.e. the one dealing with possible reactions of the local actors, we singled out not only the presence of motivation and capability, but also the direction of motivation. This could be narrower (only transport projects) or wider (the forming of the twin-city).

As the figure shows, the conceptual space of the scenarios has been created by combining the two basic factors. As a result of this combination we receive four possible scenarios, which have been named, respectively, Partners in transportation, Twin-city, Failed opportunities and Alliance for new beginning. None of the scenarios emerges purely as an automatic outcome of changes in the outward environment or as a result of Estonian-Finnish joint efforts; they all reflect a certain combination of objective and subjective factors.

As for transport-related projects, the realisation of Rail Baltic project is presumed in two of the scenarios out of four. Regarding Via Baltica motorway, certain developments would take place in all scenarios. In our opinion, the tunnel project can be realised in case of a favourable scenario only after the expiry of the time period under observation. However, that the preparatory work can start during that period and in the ideal case even the construction.

It is presumed that territorial integration of Estonia and Finland and the related people's mobility would eventually increase in all scenarios, but the rate of the integration's devel-

opment would vary significantly dependent in the scenario. We expect that a twin-city in the strict sense, involving the forming of a real single labour area, would be possible in case of only one scenario out of four.

The ground logic of construction of the scenarios

External conditions: favourable Local motivation and capability for cooperation: existing, but mainly concentrated on transport-related projects	External conditions: favourable Local motivation and capability for cooperation: strong, focus on creating efficient twin-city
Partners in transportation scenario	Twin-city scenario
POSSIBLE	FUTURES
Failed opportunities scenario	Alliance for new beginning scenario
External conditions: favourable in general, but include risks Local motivation and capability for cooperation: weak	External conditions: unfavourable Local motivation and capability for cooperation: strong

All scenarios include the need to consider, besides the North-South traffic of people and goods, the parallel increasing of the East-West cargo flows and the need to relocate cargo traffic largely from the Tallinn Vanasadam-Helsinki Länsisatama route to the Muuga Port–Vuosaari Port route. However, the situations, in which the relocations would be realised, and the related problems are different in every scenario.

All scenarios have to consider the gradual rising of the cost of production input in Estonia, although its rate would again differ dependent on the scenario. One of the most important problems the authors of the scenario texts wished to emphasise is the issue of how Tallinn-Helsinki (Estonian-Finnish) business cooperation projects should developed in such an environment of rising costs in Estonia (the issue of the second wave of business models in Estonian-Finnish economic cooperation).

As for lifestyle changes, we presume that they would occur in case of all scenarios, but in somewhat different manner. The municipal governments’ more active policies for broader promotion of integration could be mentioned in case of the Twin-city and the Alliance for new beginning scenarios.

11.3 Partners in Transportation scenario

Relatively positive economic climate which is predominant in international economy facilitates international trade.

The projects related to cargo transport, especially the construction of the European-gauge Rail Baltic, are considered the most important joint interest both on Estonian-Finnish and Tallinn-Helsinki level. Efforts will be combined to lobby those projects in the EU and the countries concerned. Other possible cooperation was expected to develop anyway with the improvement of transport opportunities.

Unlike other city planning issues, which either city will solve independently, there will be close Estonian-Finnish cooperation regarding the development of cargo transport infrastructure. It will also be forced by the need to communicate with the European Commission, to convince the latter regarding the allocation of finances for Rail Baltic by showing that Finnish cargo will reach the new railway as well and to suggest how it will reach there.

Cargo transportation – New opportunities opening along the North-South axis will create additional demand for cargo transport and related logistics services. The interests of participants in this business are not limited only to dealing with the trade between Estonia and Finland; they will also be directed to the two other Baltic countries, Poland as well as Ukraine and south-western countries of Europe. A new opportunity will emerge from handling the Asian cargo moving along the Arctic Sea.

Prioritising the cargo transport goals will create opposition and heated discussion on both sides of the gulf regarding the pursuits to raise the quality of living environment in the cities and improve the ecological situation. Solutions will be eventually found, but not without heated conflicts. It will be assisted by the gradually strengthening understanding in both cities that increasing cargo volumes can be handled without detracting the cities' normal life and development if the majority of the cargo will be moved across the gulf via Vuosaari-Muuga harbours instead of the cities' centres. This will require the separation of cargo and passengers by using different vessels and routes.

People's mobility – The pattern of people's labour- and leisure-related traffic would not change significantly. The so-called vertical mobility type will be retained in case of Estonians as well as Finns dominated by some narrow reasons for travel: labour for Estonians, leisure for Finns. This traffic pattern will gradually, but slowly become more varied with the increasingly closer business cooperation. Tourism-related traffic from the third countries will increase slightly.

Urban planning – The general development of the urban space and city planning in Helsinki is more deliberate and strategic than in Tallinn. The Finns realise some important urban transportation projects, such as tram link between Länsisatama and Kamppi metro

station, several metro line extensions, Kehärata (ring railway via Helsinki Airport), which unite Greater Helsinki's city space into an integral whole.

Enabling good connections between harbours' passenger terminals and airports is one of the key issues in city development policies. Tallinn suffers from lower standards of planning culture, cooperation problems between the city and the state as well as smaller financial opportunities compared to the northern neighbours. Therefore strategically reasonable but expensive solutions like construction of the rail-based urban transport system (high-speed tram line network) will be postponed to the future or only elements of comprehensive solutions will be realised. Therefore the opportunities that could be enabled in conjunction with either the rearrangement of transport and logistics, e.g. freeing the territory of Kopli railway marshalling yard for city planning goals or turning the sea-side into an open public space, cannot be quickly and sufficiently used.

Business cooperation – Business cooperation between Helsinki and Tallinn develops successfully at first. It is further accelerated by the opening of Rail Baltic, which will create new opportunities for logistics-related business. Businesses located in Tallinn and its neighbouring area will take over several functions of Finnish industries, including assembly of final products. The improved transport connection with Central Europe will help in that. To some extent also business services will be increased. Helsinki will benefit among other issues from closer economic relations with Latvia, Lithuania and Poland. The latter will probably become a highly important food producer in the future, while the multinationals operating in Poland may become significant manufacturers and valued cooperation partners in the engineering sector.

In the long run problems will emerge due to the decrease of differences in wages and other production costs between Estonia and Finland. A share of intra-industrial trade (subcontracting) which used to be practical due to large wage gaps and other cost differences will cease to exist. The new cooperation model characteristic to the division of tasks between two developed countries will emerge slowly. Tallinn does not have enough high-qualified labour or technological environment to start performing sophisticated and expensive production and service tasks. The significantly weaker social infrastructure and shortcomings in living environment in Tallinn compared to Finland will complicate the immigration of top-specialists and managers to Tallinn in order to overcome this bottleneck.

Summing up – By 2040 Helsinki and Tallinn will form a joint transport junction and cargo handling logistics area but not a real twin-city. Joint labour area will develop slowly. More Estonians than at present will have moved to Helsinki or its neighbourhood, the number of Finns living in Tallinn will have increased more slowly. Working weekly in another country will be a less popular solution due to the higher living standards and increased demands of the people, while daily commuting is too expensive. Twin-city will be spoken about not as a reality but rather in relation with the perspective of construction of the tunnel. This, however, will mean its realisation in the distant future, certainly after 2040.

11.4 Twin-city scenario

In a favourable (analogous to the previous scenario) economic environment a comprehensive strategy is being developed for combining transportation related projects (incl. Rail Baltic) with deliberate policies for improving the quality of living environment and integrating the businesses and urban environments of the two cities. The Helsinki-Tallinn integration is purposefully developed at the top level of either city's administration by a special commission. The governments of either country also promote the process.

Cargo transportation – The key directions in the development of cargo transportation and logistics are the same as described in the preceding scenario. Their realisation will take place in approximately analogous manner as well. However, more attention will be paid to the finding of suitable compromises between the demands of the transportation business and the requirements determined by the quality of urban living environment of the cities. Formation of transportation networks in both cities will take place according to a joint spatial vision, the necessary changes, incl. moving of cargo traffic from harbours in the city centre to Vuosaari and Muuga will be mutually coordinated. Distribution centres and technology parks will be developed jointly.

People's mobility – Efforts are made to facilitate mobility of people between the two cities, to enhance the mobility related to studies, as well as living and working in the neighbouring city. Modernisation of the urban transport systems, better linking of the ports and terminals with the transport network as well as adoption of the usage of the joint public transport ticket serve as good tools for realisation of such endeavours.

The present vertical mobility pattern will become significantly more horizontal in time; i.e. the travel motivations of both Finns and Estonians become more varied. The variety of jobs held in the respective countries will increase as well (unlike the current situation, where Estonians predominantly perform blue-collar and lower-level services sector functions). A significantly greater number of Finns will be working in Tallinn. Part of the commuters will find permanent residence in the job-related country, but this will not reduce the general intensity of people's mobility. The number of visits not directly related to work will increase.

The number of tourists from the third countries will go up with tourism marketing run jointly by Finland and Estonia serving as one of the reasons.

Urban planning – Tallinn will implement several methods for city planning and development of city projects which have justified themselves in Finland. Such policy directed to comprehensive development of urban environment will initially create opposition from some transport companies which have assumed that the inclusion in the international cargo transport corridors will automatically mean prioritising their interests in urban planning and development policies. However, it will become evident that it is possible with thought-out spatial planning and regulations to keep the conflicts between the re-

quirements of transportation and urban environment under control and to minimise the negative effect of the (transit) cargo traffic on the living environment and ecology. Solutions like building a combined (bus and rail) passenger terminal of sufficient capacity, partly-underground city rail transport system, creation of the public waterfront space in case of Tallinn which justify themselves in the long run require large investments with a long payback period. Such plans will strain the city budget for a long time even if the EU structural funds can be partly used. A tax raise probably cannot be avoided either.

Business cooperation – The above mentioned policy will create good preconditions for bringing the city region's business cooperation to a new, higher value-added level which is very important especially when the wage difference between the two capitals and other production input costs have decreased. In addition to industrial cooperation which will be even more high-tech, transport and logistics business and joint tourism business, a large role is played by firms performing various professional services (KIBS).

Although the Helsinki- and Tallinn-based firms and their strategic alliances are mainly specialised in the international markets on narrow niche products and services rather than mass products, they are able to service the clients of these niche products/services in numerous countries and thus achieve the necessary scale economy level (mass customisation process). Multinational companies happily place functions serving the entire corporation like accounting, auditing and production of audio-video commercials etc. in their branch offices in Helsinki and Tallinn. There will be many high-qualified Finns working in Tallinn. The twin-city will be valued as a working and living environment for top specialists and managers of international companies.

Summing up – By 2040 the twin-city will be formed as a closely integrated joint labour area. The differences in the quality of social services in Helsinki and Tallinn will diminish to a large extent. Helsinki has become a considerable development centre in North-Europe which is capable of competing with Stockholm and Copenhagen. Helsinki as a twin-city will stand as a candidate for organising the next Olympic Games. The construction of the tunnel between the capitals will seem as a logical step for further integration of the city space and surrounding regions.

11.5 Failed Opportunities scenario

A favourable economic situation creates opportunities for better integration in the international cargo transport logistic systems and related large transport projects (especially Rail Baltic), however, due to institutional incapability and poor cooperation these opportunities cannot be realised. A number of problems will emerge; the difficulties in agreement about the exact route for the new part of the railway and solving the land usage problems quickly. The disputes with Green activists will start due to construction of the railway near the Gulf of Riga, there will be poor cooperation between the capital of Estonia and the state, intra-state lobby activities of business groups, difficulties in explaining the EU

institutions the logistical schemes of providing significant volumes of Finnish cargo with access to Rail Baltic. Launching of the project will be delayed, resulting in the loss of the EU structural funds. Without the EU funding the direct rail link will not be possible.

Cargo transportation – The Finnish side will initiate the strategy to take the main cargo flows between Estonia and Finland away from the present Helsinki Länssitama – Tallinn Vanasadam route to Vuosaari – Muuga harbour route. The Estonian business circles are slow to go along with the plan, preferring to continue cargo traffic on the Länssitama-Vanasadam route and lobby for investments in the Vanasadam access roads. Such different opinions cause much confusion in the initial years.

Presuming a large cargo flow with Asia from the Arctic Sea, the Finns will conclude a railway link with Kirkenes. As the cargo transport further to south will be hampered due to the lack of suitable railway connection, this railway line will be underused and not justifying the investments made.

Both cities have lost valuable time. There will be no new direct North-South rail link. The demand for transport will grow at least initially; there will be attempts to carry cargo southward by rail over Tartu and by road along the Via Baltica. This exerts pressure on the logistical system, which had not undergone any modernisation in the expectation of Rail Baltic. The traffic situation deteriorates and conflicts between transport and environment become increasingly acute. The competitiveness of the above routes against others (maritime route from Finland to Poland and Germany; route from Finland to Germany across Sweden) will be low and they may start losing cargo in the longer perspective. Failed opportunities result in not just the loss of time and money but also a moral defeat. Estonia's image as a transit transportation country will deteriorate, worse still, Estonia will lose the belief in its capability to implement larger strategic projects, relying on short term activities of the businesses will be dominant and there will be an understanding that the Estonian public sector is inefficient and incapable of reaching any agreement. Accordingly, there is no faith in the prospects of the tunnel in the longer perspective.

People's mobility – Changes in people's mobility during the first period would not differ from those described in the first scenario (i.e. Partners in transportation scenario), but the emerging stagnation in the cities' development will have its effect in the second period. The failure to realise the Rail Baltic will somewhat curb the travel of tourists from the third countries, especially Germany, between Estonia and Finland.

Urban planning – Business cooperation between Helsinki and Tallinn will fail to form a homogenous and well-matching urban structure. This will impair the cities' competitiveness and budgetary resources. Especially Tallinn will suffer from those conditions and cannot find resources for solving the problems. Helsinki will be capable of realising its intended infrastructure projects, although with certain delay (new metro connections, the ring railway via Helsinki airport etc.).

Business cooperation – Business cooperation patterns similar to the present ones will initially continue between the Estonian and Finnish entrepreneurs, but there will be no new prospective trends. However, due to the declining differences in production input costs, the number of existing cooperation projects will start falling. The Estonian-Finnish business cooperation will stagnate.

Summing up – Both Helsinki's and Tallinn's integration with EU core areas will remain weak. The bigger role in both cities' further development will be played by the Northern Europe's internal relations and economic relations with Russia. It cannot be ruled out that both Helsinki and Tallinn will become the „suburbs” of St. Petersburg.

11.6 Alliance for New Beginning scenario

The formerly efficient development models in Estonia and Finland cease to work in the deteriorating economic environment and weakening European Union. As economic growth in the EU declines neither Tallinn nor Helsinki can hope for large export opportunities, flows of transit or increasing consumption. No one will finance large ambitious infrastructure-related projects. Both countries concentrate on cutting costs and budgets, obtaining the inevitable services cheaply and efficiently. The principle: “(Real) value for money” will prevail. Businesses will have to streamline their operations and several systems necessary for everyday life must be readjusted to the changed situation as well. People need to rearrange their accustomed lifestyles.

In the tightening budget situation, a certain localisation drive on the one hand and search for new markets and activities targeting them on the other hand would become important. Both these directions would provide opportunities for Estonian-Finnish cooperation, especially if they should be supported by efforts of the public sector.

Cargo transportation – Due to the international economic decline and the cancellation of expensive international transport projects, the opportunities of inter-European cargo transportation and logistics business will be significantly curbed. The sector can partly prevent its stagnation by handling the cargo flows related to Asia (and to some extent Russia).

Thanks to the continuing and developing cooperation between the Finnish and Estonian businesses (see the description above), the amount of local cargo, which is largely related to intra-industrial trade, will remain relatively high in the Helsinki-Tallinn ferry traffic. The need to transfer cargo traffic from the Tallinn Vanasadam – Helsinki Länsisatama route to the Muuga Port – Vuosaari Port route will no longer be as urgent. Yet this will mean only a certain delay rather than the elimination of the necessity.

People's mobility – Some Helsinki residents, especially retirees and unemployed, would change their domicile for the less expensive environment in Tallinn. However, they will make quite frequent visits to their friends and relatives in Finland.

The desire to work in Finland will remain high in Estonia, while jobs will not be easily available in Finland; therefore the number of Estonians employed there will remain below the boom-time level of the previous decade. A number of Finns will make use of the somewhat lower price level of the services in Estonia; this will serve as an important motive for visiting Tallinn. As business cooperation between Estonia and Finland will continue and develop as well (see next passage), passenger traffic between Tallinn and Helsinki will increase instead of declining.

Offering bed and breakfast services to visitors from the neighbouring country will increase in Tallinn as well as Helsinki. It will become a business sphere in its own rights. Demand for cheap ferry tickets will increase. However, as the onboard trade and services do not flourish, the shipping firms will find it hard to keep the ticket prices low.

Estonia will not be able to continue providing the current broad spectrum of university education. Many young Estonians leave to study in Finnish universities. Deteriorating financial situation will serve as incentive for research institutions to cooperate more closely in procuring equipment, making research subcontracts in the other country etc., resulting in tighter scientific contacts

The economic situation will change the spatial development of both city regions. The settlements/small towns close to the capitals, linked to them by railways, become advantageous as they allow the combining of cheaper living environment with areas of greater employment. Internal transport organisation inside the agglomerations will be reorganised, etc.

Business cooperation – The changing economic situation will have its impact on the Estonian-Finnish business cooperation, both in the production of goods and services.

The rate of closing the wage gap between the two countries will slow down allowing the Finns to use Estonia as a subcontract country for producing export goods during a longer period than in the other scenarios. Moreover, the Finnish industry will attempt to find new markets to replace the contracting European ones (East Asia, America). If Finland should succeed in that, it will be interested in involving Estonian firms, so as to increase its human potential and to reduce the costs in developing and producing goods and services for the new markets.

The new situation would also raise the issues of transferring some services to Tallinn or elsewhere in Estonia from the more expensive environment of Helsinki, opening the Helsinki city procurements to Estonian enterprises to a greater extent, etc. In this economic situation, the redesigning of various systems into more economical, efficient and

user-friendly will become quite urgent, starting from more energy-efficient buildings and ending with improving the traffic systems. Such activities are a traditional strength of Finnish companies and the changed economic situation will mean considerable demand for such services at home and abroad. This would be complemented, for instance, by various solutions for supporting and improving the quality of life of the elderly (the so-called silver economy), health care etc. Various e-services and m-services can play a considerable role in the new services models being developed. Finnish firms will be able to use Helsinki and Tallinn for testing such solutions (the living lab principle) in their local environments (it is a significant benefit for export prospects that these environments on the opposite sides of the Gulf of Finland differ considerably) and attempt to export this know-how to both developed and developing countries.

The tourism business will face rather hard times, but one of the opportunities to retain competitiveness despite the declining demand would be offering combined Finnish-Estonian tourism routes in the international market.

New airlines from Vantaa and Tallinn airports will be opened to the destinations in Asia. The Tallinn Airport, thanks to its relatively low costs, has fine chances of becoming one of the most important Asia-specialised cargo servicing airports in Northern Europe. Due to the difficult economic situation in Europe the aviation companies will consolidate in the air traffic market. This process will lead to more favourable conditions for increasing specialisation between airports.

It can be argued that even within the framework of this scenario, there will be opportunities for cooperation between Finnish and Estonian firms in the traditional as well as new fields. A promising opportunity would be the combining of the Estonian small enterprises' initiative and often innovative solutions (e.g. the use of ICT) with the advanced business models and extensive contact networks of the Finns so as to jointly gain access to third countries' markets.

Urban planning – While Helsinki will be able to complete the planned strategic projects although with delays, the situation in Tallinn will be worse. Several prospective projects, e.g. the rail based public transport system will be stopped due to the lack of funding. In some cases the stopping of major projects related to the construction of traffic arteries, e.g. the north passage, could reduce conflicts with the local communities defending their parochial interests. On the other hand, it would delay the improvement of the urban environment.

Both capitals would attempt to increase the efficiency of their municipal services systems while improving their human-friendliness as well. The primary opportunities would be the detailed design of these systems, good logistics and extensive implementation of e- and m-services. Tallinn in particular would have fine premises and experience for the latter. The motivation for preferential development of public transport will increase, since al-

though it will require certain investments, it would also result in saving on the decreasing need for new roads and crossings as well as road maintenance costs.

Summing up – Although traffic intensity between Estonia and Finland would be somewhat lower in this scenario than in case of the others, the planning and efficiency level of cooperation could actually be higher. In case of this scenario we could presume a somewhat greater progress in grassroots relations than in other scenarios. Cross-border activities at the local governments and national level would be more intensive than in the Partners in transportation and Failed opportunities scenarios, although not as intensive as in the Twin-city scenario. Business cooperation need not be limited to the existing businesses and business models, but could include new spheres better suited to the period. Provided Finland and Estonia would be able to occupy the position of one of the East Asian gateways to Europe, the Helsinki-Tallinn competitive position compared to e.g. Sweden could even improve. If the European economy should start growing again after the standstill (we presume that it would begin before 2040), Helsinki and Tallinn would be well placed to participate in it. The postponed major infrastructure project could then re-emerge, this time based on newly developed technological opportunities.

Main development parameters by different scenarios 2012–2040

	Partners in transportation	Twin-cities	Failed opportunities	The new beginning
Economic growth (long term average per year) in North European region	>3.3%	>3.3%	>3.3%	<2%
Cargo flow average growth rate between H&T regions (incl transit, excl Arctic flow)	From 2011–2020 about 9–10%, about 7–8% after 2020	Till 2020 about 9–10%, after 2020 about 7–8%	Till 2016 about 8%, after 2016 less than 5%	Less than 6%
Additional Arctic route connected cargo	About 1.0–1.5 million TEU 2030, over 70% to the South of the Gulf of Finland	About 1.0–1.5 million TEU 2030, over 70% to the South of the Gulf of Finland	Less than 0.3 million TEU	?

Main development parameters by different scenarios 2012-2040

	Partners in transportation	Twin-cities	Failed opportunities	The new beginning
People's mobility (general trends)	The number of one-day visitors and tourists will increase in either direction together with the economic growth figures. Work and family ties-related mobility gross faster than work-related	The number of one-day visitors and tourists increases in either direction more than 10% per year. Work- and family ties-related mobility will increase faster.	The number of one-day visitors and tourists in either direction does not increase significantly. Work- and family ties-related mobility increases moderately.	The number of one-day visitors and tourists in either direction increases together with economic growth figures. Work- and family ties-related mobility increases over 10% per year.
Average growth rate of passengers by sea between Helsinki&Tallinn	About 4–5%	Till 2020 about 5%, about 7% after 2020	About 4–5% till 2016, less than 4% afterwards	4–5%
Transfer of cargo transport from Länssatama-Vaanasadam route to Vuosaari-Muuga route and decrease of RoPax fleet's share	Existing need, but temporary ignored because of short-term economic interests	Existing political will to solve the problem in realistic time framework	No political will to deal with the problem in the first part of the period, no so big pressure at the second part of the period	Not very urgent problem
Direct European-gauge Rail Baltic	After 2020	After 2020	No realisation	No need (too small cargo transportation demand)
Main spatial projects, connected with change of transport situation in Tallinn:				
Opening city to the sea and completion of Põhjaväli (Northern passage)	The conflict between transportation needs and urban space quality will be solved in favour of transport interests	Balanced solution	As scen. No. 1, but even more contradictory	Solved in evolutionary way

	Partners in transportation	Twin-cities	Failed opportunities	The new beginning
Increasing density of urban space, increasing its attractiveness and quality	Thanks to economic growth and its prospects, activity of real estate development, esp. business-related, high in Tallinn. Development of urban space quite spontaneous	Good premises thanks to business and high demand by paying residents. Development of capital city according to definite urban construction concept and in cooperation with Helsinki	Like scen. No1, but business-related real estate development motive drops (suddenly?) at some moment	Activity low due to money shortage, erroneous decisions can be avoided, more economical (and ecological?) solutions sought and implemented together with the Finns
Talsinki 2040 (main characterisation)	Common transport and logistics node	Common labor area, real twin-city	?	Active cooperation in many fields
Perspectives with undersea tunnel project (after 2040)	Potential perspective	Urgent need	No perspective	No perspective before 2050

REFERENCES

Terk, E. (ed.) 2012. Twin-city in the making. Integration scenarios for Tallinn and Helsinki capital regions. Tallinn University Estonian Institute for Future Studies, Tallinn

12. Territorial Impact Assessment

*Peter Ache, Radboud University Nijmegen and Jenni Heikkinen,
YTK Land Use Planning and Urban Studies Group, Aalto University*

12.1 Aims and method

One element of the current project was to provide an assessment and evaluation of the scenarios, presented in the previous section. For that matter, the new method of Territorial Impact Assessment (TIA) was chosen. TIA is a very recent addition to the existing repository of spatial planning instruments. At a European level it was first mentioned and proposed by the ESDP (1999¹) in particular for the assessment of large scale projects, like transportation infrastructures. There is no single model that determines TIA, but in terms of a general principle it can be characterised as an instrument for assessing the impact of policies, programmes, or plans against spatial policy objectives and as the identification of resulting prospects for a defined area or territory (Zonneveld/Waterhout, 2009)². TIA can also be seen as a coordinating instrument with the particular interest to provide a vested but still preliminary assessment of intended policies. This dimension fits very well with the H-TTransPlan project, which, as an Interreg project, is modeled using an actor perspective.

The specific approach for the current project started from minimum requirements (Zonneveld/Waterhout, 2009) which were translated for the purposes of the H-TTransPlan project. Following from this, a scoping exercise, an analysis of existing policy documents, and finally a first level assessment of the given scenarios were undertaken. In addition, during several rounds of stakeholder processes and with questionnaires and interviews of additional stakeholders, this first level TIA has been completed. At a later stage, not

1 Policy Options 29, 42 & 52 refer specifically to the use of TIA.

2 The ESPON research programme tried to further develop TIA by applying it to policies and programmes from particular policy fields. Projects 1.1.3 "Enlargement", 2.1.1 "Transport Policy impact", 2.1.2 "R&D Policy impact", 2.1.3 "CAP impact", 2.1.4 "Energy", 2.1.5 "Fisheries", 2.2.1 "Structural Funds impact", 2.2.2 "Enlargement, Acquis, Pre-Aid, Phare/Tacis", 2.2.3 "Urban in Structural Funds", 2.3.1 "ESDP impact", 2.3.2 "Governance", 2.4.1 "Environment", 3.3 "Lisbon Strategy", 3.4.2 "Economy" can be consulted for such applications. Recently: TIPTAP.

accessible during the time of writing this short report, a quantitative study on possible regional impacts of a tunnel connection will complement the TIA. For the purpose of this brief summary, the comparative reading of policy documents and scenarios will be looked into, with additions from the expert survey. That will be followed by an overall conclusion regarding territorial impacts.

12.2 Empirical analysis

A central cornerstone for the assessment have been policy documents from inside and outside the two regions. Overall, almost sixty documents were analysed from both parts of the region, from different levels, with different scope or sector perspectives, with different levels of binding quality, or written for various target groups. The documents roughly cover a history of one decade, and also look ahead into the future for about one decade; the widest reaching perspective being actually the year 2050. The rich set of documents formulates a system of about one hundred twenty aims, about four hundred twenty objectives, and around six hundred and eighty targets can be found in those documents. The analysis of the scenarios was conducted as text analysis, using the outcomes of a systematic reading and related text analysis of the aims, objectives, and targets found in the policy documents (see Figure 10.1). This way it was possible to identify the level of concordance or dissonance between scenarios and policy documents.

Existing Policy Framework – The policy documents in general emphasise the aspect of ‘development’; the scenario texts follow suit on that aspect. To various degrees, the particular aspects are to develop the economy and businesses or enterprises, and more generally ‘markets’. The New Beginning Scenario has a stronger development orientation as the other scenarios; the partial austerity policy is matched with an agenda of ‘let the market do it’. The stronger impulse in the scenarios results from externally generated effects; mainly through transport and traffic, due to changes in global transport routes. In terms of ‘transport’, all scenarios work with a growth of cargo flow (including transit, excluding Arctic Circle flows, based on results of the mobility study, see Chapter 6). The policy documents emphasise aspects of the ‘environment’ quite much. Aspects included are emission levels, air quality, climate change, CO₂ emission, green and natural environments, pollution, water etc. Safeguarding the natural environment, in short, seems to be an important issue. The environmental perspective of the scenarios is one of business operations, transport, decision making, and administrative actions; aspects of the natural environment are less developed.

The category of ‘space’ (or territories) is quite important for the entire project, especially regarding the territorial impacts; which territories are considered important in the context of policy documents and scenarios, likewise? For the policy documents, aspects like city, urban, or more generic ‘centre’ are important categories. The scenarios formulate similar perspectives, but when going beyond the first level of comparison, the scenarios clearly see a trend towards a centralized development pattern.

Policy Frameworks and Scenarios – Concordance or Dissonance?

	AOT	Partners in transport	Twin city	Failed opportu- nities	New beginning
development > develop*	●	●	●	●	●
economy > business*	●	●	●	●	●
economy > consumption	●	●	●	●	●
economy > econom*	●	●	●	●	●
economy > enterprise*	●	●	●	●	●
economy > entrepreneurship*	●	●	●	●	●
economy > growth	●	●	●	●	●
economy > industr*	●	●	●	●	●
economy > market*	●	●	●	●	●

The Figure shows the concordance and dissonance of the scenarios and the policy aims, objectives and targets (hence AOT) in a dictionary related to economic issues. The traffic light symbols have been used to visualize differences between scenarios and between the AOT and the scenarios. The green is an indication of a clear positive match (marking an entry as falling into the 15% of the words used most frequently), the yellow shows a general similarity of orientation in themes and the red marks entries that have not been addressed.

Sustainable development is an obvious issue in policy documents. However, they use sustainability not always in a triangulated meaning; it can also be just economic sustainability. Surprisingly, this does not find a match in the scenarios, which are basically void of a strong sustainability idea.

Likewise is transport an issue in policy documents as well as in scenarios, with a clear focus on rail and passenger transport perspectives. A further interesting aspect is the absence of a reference to cycling or walking. Airfield, airport is neither an aspect the scenarios emphasise a lot.

Overall, the scenarios express a ‘development’ attitude which focuses on centres of the region but which is quite weak with respect to natural resources and environmental sustainability aspects. The scenarios as such are on a par with the general development

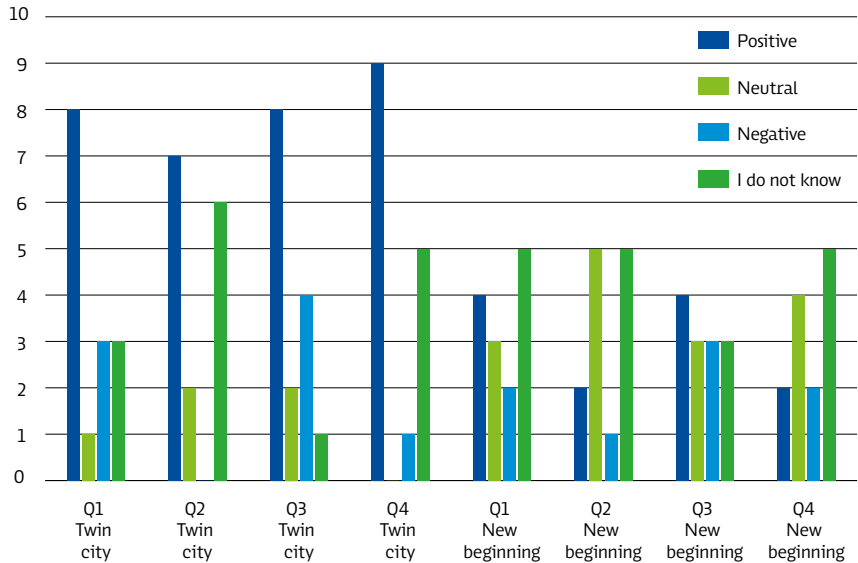
attitude of policy documents; they deviate with respect to sustainability and environmental aspects.

Territorial Cohesion – One particularly important perspective is derived from the European discussion about ‘territorial cohesion’(EC, 2010). Categories defined for territorial cohesion are for instance territorial efficiency, territorial identity, and territorial quality (TIPTAP, 2010). A general observation from policy documents is that all listed issues of territorial quality, territorial efficiency or territorial identity are visible in the existing set of policy documents and orientations. More specifically, aspects of territorial efficiency seem to team up with energy issues, network ideas, public action, and resource allocation. Aspects of territorial identity peak with aspects of culture and international relations. Aspects of territorial quality demonstrate higher frequencies regarding safety issues and the quality of services. Compared with that, the scenarios cover fewer aspects. Visible issues are ‘cooperation’, ‘international...’, and ‘quality’. Between the scenarios, the Failed Opportunities Scenario shows the largest amount of missing issues. Overall however, the aspect of territorial cohesion, at least when looking at the entirety of its dimensions, is calling for additional attention.

Additional aspects regarding the assessment of the scenarios in terms of relevant outcomes were found in the expert survey, which was a part of the TIA work. Two aspects stand out, that of polycentric development and that of governance. Polycentricity is one way to characterise a more balanced territorial structure that is a pattern based on several thriving centres. Governance relates to the management process of spatial change or, in the current case, of strategy formation and implementation. Following a European logic, both aspects support a more cohesive development pattern as they help develop region specific ‘territorial capital’.

Polycentric development – It was felt by a majority of the respondents and interviewees that the integration of Helsinki and Tallinn would benefit both countries, but it would benefit the capital cities more. A majority of the experts felt that the Twin City Scenario would have positive impacts on the polycentric and spatial development and enhancing connections between regions in Finland, Uusimaa, Estonia and Harju (See Figure 10.2). A smaller amount of the experts felt the same with the developments in the New Beginning Scenario. Transport connections were used as grounds for the impacts, for instance the Rail Baltica line would carry benefits along its route. However, there were also strong critical comments from a few experts. The Twin City Scenario was thought of bringing opportunities and enhancing connections, but the impacts for balanced and polycentric structure were less positive. They believed that the New Beginning Scenario could actually lead to a more balanced structure. Despite of a strong twin city developing European level polycentricity in the Twin City Scenario the development inside the countries could be less balanced. One particular argument was that both countries are capital centred and furthermore the capitals are striving for full capacity instead of looking for cooperation and completing each other. Also, the interviewee felt that generally differences between areas are growing instead of diminishing, even in good economic conditions. Another

Expert Survey – Polycentric Development



- 1 What is the impact of the developments outlined in the scenarios on polycentric and balanced development and enhancing connections between different regions in Finland?
- 2 What is the impact of the developments outlined in the scenarios on polycentric and balanced development and enhancing connections between different regions in Uusimaa?
- 3 What is the impact of the developments outlined in the scenarios on polycentric and balanced development and enhancing connections between different regions in Estonia?
- 4 What is the impact of the developments outlined in the scenarios on polycentric and balanced development and enhancing connections between different regions in Harju?

expert argued that in times of recession capital regions generally benefit in relation to other regions. Thus, according to the experts, it is unsure that neither one of the scenarios would bring about polycentric and balanced development in the countries without further support.

Governance – The experts were asked about possible future forms of governance to operate a tunnel or to build a twin city such as in the Twin City Scenario. The range of opinions for the twin city governance varies from free cooperation through gradually intensifying cooperation to common councils or political institutions. Many emphasise that the cooperation form must have real power. The cooperation forms suggested included only city level institutions, apart from one exception. One of the interviewees also noted that

the city administrations are more active and that the state level has not committed to a common cooperation, up until now. Regarding the possible governance of the twin city, international examples were mentioned, for instance Malmö-Copenhagen, Tornio-Haparanda, or the Greater London Authority.

One interviewee said that the tunnel is more difficult an issue since it would demand EU, national and city level funding and strong EU level pressure in order to make the connection between these cities feasible. Looking at the experience of Rail Baltica the national ministries have not been very active, which has slowed down the process. For the operation of the tunnel a city administrative agreement, a common council as well as a private or city owned company were suggested as governance forms using the examples of the Channel Tunnel or the Öresund Link. One interviewee raised a question about the tunnel: What is the “functional intention” of it? At current it is not clear to which extend the intentions behind the tunnel are really oriented towards the cooperation or integration of the two countries. The governance of the tunnel perhaps also links to this question, who would get the most benefits from it?

12.3 Territorial Impact Assessment

The novelty of TIA as an instrument and the chosen approach for the H-TTransPlan project allow only for a first level impact assessment. The overall intention is to assess in a consistent way and ex-ante the impact of a complex project, in the given case the question of a possible tunnel connection between Tallinn and Helsinki as well as additional strategic options accompanying that. The basic elements for the assessment came from scenarios, speculating about different futures for the regions. Then, what can be said about the territorial impacts?

Compared with the existing policy framework, the scenarios support the economic development perspective. However, they also show a void in environmental and other sustainability aspects. Also aspects of quality of life, including resulting social changes, need closer attention. Here, the team, stakeholders, focus groups need to look closer into possible impacts and try to identify matching set of policy, either to compensate for/or to avoid negative impacts.

Territorial cohesion finds only a quite narrow definition through the scenarios. Aspects of efficiency are present; aspects of identity are less frequently addressed, though cooperation and internationalisation are identified issues; the quality dimension, compared with expressed policy aims, shows a larger mismatch and therefore needs to be looked at more intensively.

That results in a set of open questions and search fields for complementary policies: The scenarios resonate very much with the economic development aims. The scenarios discuss the improvement of ‘flows’ in two dimensions: one can be identified as mainly going

through the two regions, the other as being generated within the region and leaving the region (more precisely: the regional economy!) to non-Finnish or non-Estonian territories. However, on closer inspection, the enhanced accessibility is an external perspective, that is, the focus is on stimulating demand outside the region to purchase goods and services from the Helsinki-Tallinn regional economy. The internal perspective is missing, i.e. the aspect how the envisaged developments can improve and strengthen the internal operations. Regarding both, the existing orientations in policy frameworks but also in the project, the improvement of mobility and transport systems 'inside' and 'between' the two regions needs to be further looked at.

Looking for instance at the two alternatives to link Helsinki and Tallinn, a possible one-word equation could be the following: Tunnel equals throughput; Ferries equal input. The input option, so the better organisation and management of internal flows from a regional economic perspective, is certainly the more relevant for the idea of creating a fuller integrated city region between Helsinki and Tallinn. The throughput option, that is the improved long distance transport flows with a view to external relations, has as its advantage the creation of a nodal region at a European scale.

In terms of polycentric spatial development, the scenarios stop short in their perspective of emerging new spatial structures. Here, clearly a call goes out to local actors and stakeholders to explore the possible impacts on existing spatial structures and the opportunities for a polycentric structure.

In terms of social and economic cohesion, the element of economic development is certainly present, though the trend towards mutually cohesive developments, like job opportunities, are less clearly sketched out. However, the aspect of social and economic cohesion is considered quite positively in all scenarios.

The dimensions of territorial cohesion are presented with different general perspectives. As can be expected, the aspect of efficiency is highly visible, mainly due to the assumption of an improved accessibility. Compared with that, the aspect of identity is certainly less visible. Aspects of quality of life and places ranges at an intermediate level but actually more formulated as a pre-condition for other positive developments latching on.

The scenarios develop a distinct understanding of the concept 'spatial' or 'territory'. From a scientific point of view, the chosen meaning of spatial and territorial is basically a very functional perspective. Spatial structures need to be in place to provide the right conditions for the operation of the economy and society. It is a container idea, the right form and amount of infrastructures will satisfy the demand which resides mainly with economic actors. The idea of 'flows' finds an interpretation in a one-dimensional way that is allowing in particular goods to flow. What is needed though, especially with respect to territorial cohesion ideas, is to reflect on the deeper dimensions of 'flow'. Those dimensions describe mobility as a more essential phenomenon of modern society, with features like multi-modality, asynchronous mobility patterns, and spatial augmentation. In a sense, spatial and

territorial structures, or the urban fabrique, should provide multi-dimensional 'linking' qualities (Taylor et al., 2010).

A last aspect relates to the territorial coverage of outcomes. At the moment, the scenarios work with global and EU wide patterns that require the elaboration of the two nodes of Helsinki and Tallinn, both mainly feeding-in or through-putting cargo and, to a lesser extend people. That puts the two locales and adjacent functional urban regions at risk – the risk of being ultimately bypassed through the flows it allows to create. It was expressed in expert views as well, that a general strengthening of the regional capacities and especially developing the territorial capital of a joint metropolitan region still lays ahead. This provides ample opportunities for creative political thinking and the setting of a strong political will to form a metropolitan space with Helsinki and Tallinn.

REFERENCES

- EC. (2010, November). Investing in Europe's future. Fifth report on economic, social and territorial cohesion. Luxembourg: European Union.
- EC (1999). ESDP - European Spatial Development Perspective. Towards Balanced and Sustainable Development of the Territory of the European Union. Agreed at the Informal Council of Ministers responsible for Spatial Planning in Potsdam, May 1999.
- Neuman, M. and A. Hull (2009). "The futures of the city region." *Regional Studies* 43(6): 777-787.
- Politecnico di Milano, & ESPON. (2010). TIP TAP, Territorial Impact Package for Transport and Agricultural Policies Final Report – Part A and B. Applied Research Project 2013/1/6. Luxembourg: ESPON.
- Taylor, P. J., Hoyler, M., & Verbruggen, R. (2010). External Urban Relational Process: Introducing Central Flow Theory to Complement Central Place Theory. *Urban Studies*, 47(13), 2803-2818.
- Zonneveld, W. and B. Waterhout (2009). EU Territorial Impact Assessment: under what conditions? Final report. Delft, OTB Research Institute, Delft University of Technology.

13. From knowledge platform to decision support system

A two-year story to be continued

*Damiano Cerrone, Panu Lehtovuori and Helen Pau,
Estonian Academy of Arts, Faculty of Architecture, Chair of Urban Studies*

13.1 Idea of knowledge platform

In the preparatory discussions for the Helsinki-Tallinn Transport and Planning Study, the lack of common information-sharing platform between Helsinki and Tallinn was recognized as one key problem. Neither officials nor other actors could easily access relevant documents, contacts and sources. Common issues between the two were hard to formulate, let it be to discuss and decide. Thus, Peter Ache, Olli Keinänen and Panu Lehtovuori, with ideas from Kristi Grišakov, decided that the work of Estonian Academy of Arts should focus on Knowledge Platform, conceptualized as a new virtual layer of the twin-city Helsinki-Tallinn (Talsinki). Knowledge Platform should make the connectivity and shared reality of the twin-city more actual and understandable. It should become a communication and project development platform for cities, regions and other actors. In the long run, Knowledge Platform might become one of Talsinki's main Internet interfaces, shaping its brand and processes.

Long journey starts with one step. The first primary target of Knowledge Platform was to collect and make accessible material that is relevant for the urban and traffic planning professionals, politicians and other actors, working with in the development of Helsinki and Tallinn Regions and the common issues between the two.

Practically, the Knowledge Platform project has been:

1. Collecting a good sample of relevant academic research papers, internal studies and reports, assessments linked to planning, official statements linked to decision-making, press coverage, business news investment decisions on Helsinki-Tallinn transport connections, political discussion and links to relevant sites from both Helsinki and Tallinn regions.
2. Making the found documents electronically accessible.
3. Studying opportunities for an openly accessible and widely used database program and two-way interface, with the help of EUREGIO platform provider.

The content structure of Knowledge Platform consists of seven categories:

Actors: contact list of main actors/drivers of the twin city region process gathering a relevant list of key persons/actors/drivers involved, as “address book” structure.

Policies: essential list of European, national, regional, local transportation and planning related policies.

Planning documents: visual materials related to city and regional planning documents

Infrastructure projects: list of projects received from Helsinki/Tallinn research team members

Research: analysis, studies, final reports on topic related projects, assessments, etc.

Media: online based information (articles, broadcasts, different kind of publications, etc.)

Social media: includes blogs, groups, forums where Helsinki-related discussions or actions are undertaken

The resulting online interface from where is possible to access the content, was realized by Euregio IT specialists.

During the project, the potential of opening the Knowledge Platform for actively interested general public was confirmed. Thus, Euregio created a new URL Talsinki.net, which became the public access point to the Knowledge Platform. Talsinki.net is the first publicly available database of documents related with the development of the twin-city region. This project was referenced by PhD Kristi Grišakov at the international AESOP conference (Ankara, Turkey 2012) as a good example of new web-based tools for planning and communication.

13.2 Decision support system – a novelty in planning

While the Knowledge Platform is of high value for planners, researchers or anyone else involved in the development of the twin-city region, the form documents are archived and presented makes their accessibility an addressbook-like consultation. The question raised by the EKA research team was how to improve the functionality, so that the documents could actually be used for planning the common roadmap?

Focussing on the major infrastructure projects in Helsinki and Tallinn regions, we found that a crucial question is to improve understanding of the relations between the projects and their links to other issues, such as land-use decisions and policies. In order to start working on a common roadmap, planners have to better understand the complex and inter-related totality of the emerging international city-region. Currently, there are no tools or practices that would help such understanding.

A relevant spatial vision for the twin-city region has to address the direct interdependencies between projects, their order, time-scales and uncertainties, as well as indirect rebound effects, ie. new opportunities created in the process. In the case important inter-relations between actions in different cities are found, the planning offices of both cities (and regions) should coordinate their local interventions for better efficiency, quality and cohesion of the twin-city region. Such process will likely improve mutual understanding and trigger knowledge exchange among the two cities' experts.

How to reach these goals? Our solution was to restructure the Knowledge Platform database and develop it onto a Decision Support System (DSS).

DSS can be defined as an interactive software-based system, which helps decision-makers to compile useful information and business models to identify and solve problems and make decisions. DSS are used most commonly in finance, industry and health care. A good example of a knowledge-based DSS is the supporting tool for the implementation of the Comprehensive Africa Agriculture Development Program (<http://www.resakss.org/>). DSS are used not just to support the decision-making process based on knowledge, but they often provide models to reduce decisions from many to few. In some cases, they even provide most optimal answers, thus being a form of artificial intelligence.

In regional and urban planning, decision-making is commonly supported by GIS technologies. The geo-coded data can be processed thanks to a set of models that help finding the best solutions and most efficient decisions to be undertaken. In a very simple case this may happen by overlaying different geographic information layers on top of each other or performing forecasting analysis based on the data available. Typically, the research, analysis, creating alternatives and evaluating them are not integrated to form a DSS, but they rather stay as independent processes with non-ideal interfaces. It is, thus, fair to say that in our field a fully developed DSS is a novelty. The EKA research team has been doing pioneering work with international relevance.

13.3 Concept and structure

For H-TTransplan the DSS is defined as a knowledge-based interactive information system, which can be accessed online to support the decision-making process, structured on the interrelations of documents archived in a database. The database structure was borrowed from the Knowledge Platform, but the quantity of documents was reduced. Links were structured to support decisions on the major infrastructure projects planned and envisioned in Helsinki and Tallinn.

The EKA team has read all documents, understood their importance and given keywords. After the reading, also different metadata is added to each entry, as a summary of the documents, authors, country and year of publication, and so on. This extra information is also enhancing the decision support system since it can be used to give a visual order to the database. It is for example possible to visualize the documents by country, category or year of publication. Thus, the system can find interrelations among all documents in the database, including actors, policies, planning documents, infrastructure projects, research, media entries and debate in social media.

An important dimension of the metadata is the scale of influence of the infrastructure projects. The notion was discussed extensively in the broader Research Team and Focus Group for planning and transport. Scales of influence can be applied also to actors and policies, establishing a “spatial hierarchy” in the data. To better understand the relation between the projects and the other database entries, we have refined definitions for 7 scales of influence:

European: The project has influence beyond Estonia and Finland, with direct or indirect effects on the larger (EU) scale (ie. Baltic Sea Region, EU-Russia, EU-level transport policy...)

National: The project is nationally significant but lacks a clearly defined or visible international dimension (ie. national rail projects).

Regional: The project's main influence is either in the region of Uusimaa or Harju maakond.

Helsinki-Tallinn twin-city region: The project has direct or indirect effects regarding the emerging Helsinki twin-city region, ie. opening new dynamic between the two.

Metropolitan region: The project concerns either the commuting area of Helsinki or Tallinn, or the respective city region: Helsinki Region or Tallinn and the surrounding municipalities.

City: The project concerns and is mostly financed by the City of Helsinki or City of Tallinn.

Local: The project's main influence is local, ie. city district, neighbourhood or one place.

The given definitions were used to realize an online survey that received answers by 10 fellow members of the H-TTransplan research team. The survey gave a partial result, only, because of the limited number of participants and the discrepancies found in some answers. This led to a intensive discussion in the gatherings of two Focus Groups formed by the experts in transportation and planning on both sides, one in Helsinki (Gordon Douglas, Matti Kivelä) and the other in Tallinn (Erik Terk, Jüri Sakkeus, Jüri Kurba, Anu Rentel). These groups have separately given the answers to the questionnaire.

In general, the metadata of each entry is not seen definite and final. Rather it represents a first step towards a developed methodology for a professional and broadly used Decision Support System.

13.4 Data collection

Finding all relevant policies, plans and other data from EU to local has been a challenging task. The starting point of our research was the knowledge acquired H-TTransplan. Especially useful was the policies list collected by Aalto University research team (Jenni Heikkinen, Peter Ache). A broad Internet research was carried out, starting from the main institutional web pages and following the almost infinite snowball effect that the papers have caused. Due to the very short term of this project, there was no necessity to undertake a bibliographic research as all the key resources were available online and easily accessible.

The very first idea of how to sort the information was using the “scale of influence” of the issues contained into the found resources to build a structured hierarchy on two levels, archiving the resources by scale of influence (level 1) and category (level 2). This method was temporarily dropped because of the survey results reported above. Therefore the Knowledge Platform categories were followed to order the information: policy, research, planning document, infrastructure project, media, social media, actor, and statement.

Easily accessible up to date legislative web pages make it easy to find needed materials. From Finnish side more materials were in English, including abstracts and summaries in the beginning of documents and publications provided from authorities, as well as being more concerned on creating general awareness and knowledge on topics such as transport, urban planning and environment.

Most of the research papers chosen into current database are referenced by or referring to documents from policy category, which creates coherent look on information collected.

Research on media gives overall view on topics most likely holding up the interest of media. General use and understanding of Talsinki is mostly connected to single terms instead towards to a well-connected system. Deeper systematic insight through media could create interesting overview of the general real understanding on Tallinn-Helsinki connection. This warrants further research.

The combined DSS / Knowledge Platform has found about 600 records. In the short time given, we were able to archive in the database 350 documents.

Policies – 100 docs

The policies were our main focus as we recognized in this category of documents the key of our work, as outcome is the largest group of information acquired, including European Union policies on transport, regional policy, environment, maritime affairs and fisheries; documents created by Estonian Ministry of the Environment, the Interior, Foreign Affairs, Economic Affairs and Communications, by Finnish Ministry for Foreign Affairs, of the Interior, Transport and Communications, the Environment; papers from Harju County, Uusimaa Region (including Helsinki Metropolitan Area and Greater Helsinki), the City of Tallinn and Helsinki. Approximately 100 entries of legal acts, policies, strategies, visions, declarations and guidelines are completed. Main focus is on European legislation being adapted on Estonian and Finnish side or being referenced on other scales. Other big part includes Finnish national, regional and smaller scale papers, Estonian side is represented more modestly. Importantly draws out the key word “Baltic Sea Region” which is present in the territorial cohesion policy, in the debate on environmental issues, the spatial planning, the transport matters and research field. The spectrum of observation for this category went beyond the Talsinki region as we found the European policies strictly connected with the development of the Talsinki city region.

Research – 70 docs

The category was populated with approximately 70 entries fulfilled. Material includes different kind of studies and assessments (transport) as well as study reports, presentations, etc. Most of the material is outcome of a co-operational projects part-financed by European Union. Other big part of the material is a background researches connected to documents belonging to the policy category. Most visible are studies on transport sector and on environmental issues concentrating on the Baltic Sea, less was found on spatial planning.

Planning documents and infrastructure projects – 20 entries

The category represents visual or communicative planning and infrastructure documents, as we wished to separate the policy documents tied with, for example, a Regional Master Plan apart from its visual/communicative material. Those resources consist of projects with confirmed/estimated time schedule and budget or future ideas not present in the

official city agenda yet, lead by general policies and researches and performed mostly on regional, city or local scale. Infrastructure projects presented hereby are taken from the list of projects provided by the City of Helsinki and Tallinn. Small number of entries can be caused by the fact that some of the projects are sub-projects of some bigger development, some are in a phase of discussion or no public data is available.

Media – 40 docs

The category gives brief overview of topics reflected from online periodical publications and broadcasts. Approx. 40 entries should give general idea of the topics possible to be found in media connected to Tallinn-Helsinki relations. Most of the resources found are related with transport and cooperation issues tied with the creation of a physical linkage (tunnel, ferries). Some cultural exchange events can be found. Also topics related to Estonians in Finland, Finnish people in Estonia and tourism are recurring.

Social media – 10 links

The category gathers sources where single persons or group of people are showing or sharing interests, express their ideas or have an active role towards the idea of Helsinki region development and related topics. Activity or visibility of related interest groups seems to be low. The general trend seems to create social networks among one nationality and mixed networks or co-operations are hardly to find. Entries loaded in the online system are around 10.

Actors – 30 docs

The category includes about 30 entries of organizations taking part of decision or opinion making. Organizations vary from network platforms to single company, having interest in specific matter. Most of the private/national owned organizations belong to the transport sector. Other big group is created by network/forum/platform type of organizations with a focus on policy/strategy/vision creation.

The amount of documents in each category was counted in September 2012 but is constantly increasing since more documents are being added in the DSS.

13.5 Technical coding, needed collaborations

The realization of a Decision Support System involves skills of information technology, digital archiving and database management. Either the knowledge or the practical “know how” regarding design and populating the database was managed with the consultancy of PhD Daniel Giovannini who gave the database structure, a taxonomy framework and practical guidelines to build a XML structured database. His consultancy has also pro-

duced the roadmap for the technical implementation of the tool and how it can evolve from a demo to a professional application.

This specific database format was chosen because of its high compatibility character, as we set the aim to collect the data in a format that would not be tied with a proprietary file extension and able to give us the possibility to be compatible with most of the database platforms / software. Finally, the actual database coding and management has been achieved by the IT expert Priit Tamme, under supervision of Markus Hausamann (Cloud Solutions). The EKA research team has made an Agreement of Intention to continue the DSS development with Tamme and Hausamann.

13.6 Final result, first user feedback

Access to the DSS was given during the whole development phase to the Partners of H-TTransplan project. Expertise from Tallinn and Helsinki was involved, and comments and feedback regarding the content of the database and the usability of the web application were quite positive and encouraging. Even though a test-version, the DSS has proven to be useful both in terms of providing information and acting as a platform for discussion and decisions. City of Helsinki, especially, has been supportive, seeing a clear potential for future.

The use of the DSS was not limited just to the review of its content and functionality, but was adopted as support system for the assessment of the scale of influence of infrastructure projects. This process had its clue moment when in a joint meeting of Helsinki and Tallinn specialists of planning (Helsinki, 25.06.2012) the DSS was taken in consideration for reach a mutual agreement on the scale of influence of major infrastructure projects on both sides. While the twin-city region's discussion is not finalised, yet, the scale of influence of infrastructure projects was officially adopted by the City of Helsinki for its next General Master Plan (Rikhard Manninen, Douglas Gordon).

13.7 Expected next steps

The DSS should be developed towards a serious planning and communication tool, with direct utility to municipalities, regions and national planning and programming. A well-structured and accessible database is also useful for policy-development on all scales and fostering cross-border cohesion. Such Internet-based and open system is fully in line with Estonia's national IT strategy working towards agile and efficient "e-state" as well as Finland's national process to open public databases and develop electronic access to public service (SADE project). The development creates platform for international research & development cooperation and commercial service start-ups.

In the future, the DSS can be focused on different uses. Some possibilities:

- Establishing a public-interest platform for cross-border cooperation based on mutual awareness
- Non-profit tracking the progress of development of the twin-city region
- Educational site, edutainment and game opportunities
- Communication tool to give a comprehensive and immediate picture of the twin-city region for specialists, researchers or anyone interested in Talsinki
- International branding tool with potential of for-profit communication services
- Decision support system for planners working on spatial cohesion of the twin-city region
- Supporting knowledge-based policy-making in the twin-city region and beyond (national, EU)
- Platform to establish a dialog with stakeholders and decision-makers, to have quick picture of the ground for their strategies and common vision
- A platform for new expert service on regional planning and governance, with international export potential
- Research tool for scholars or urban and regional studies
- Interactive analytic tool for analyzing the roles of actors functioning as social network analyst.

Taken together, Decision Support System has the potential to become one of the “Strategic Projects” of the H-TTransplan project. The tool can be adopted to support the implementation of the Joint Actions proposed by the Project.

14. Focus group reports

Olli Keinänen and Jasmin Etelämäki, City of Helsinki

HTTransPlan project organized four rounds of workshops and round table discussions organized in three focus groups: Transport, Urban Planning and Business Development. This process took seven months and was attended altogether 68 specialists and representatives of stakeholder organizations, such as 6 transport and terminal operators, 8 business development organizations, 6 municipalities and regions, 6 ministries, and 6 research institutions (list of members, see appendix). The focus groups were presented research reports, drafts of scenarios and territorial impact assessments. The focus groups gave especially valuable feedback for forming of scenarios and for the first drafts for the roadmap of developing of the transport system. In April 26th 2012 the three Focus Groups concluded on their recommendations.

14.1 FG Business development

Focus group Business development members considered Helsinki-Tallinn region already now as an integrated area to do business. Development of the common labour market area is happening but lags behind. Despite convergence in factor costs, there is no sign of weakening business integration.

Investments based on cost differences give way to those aiming at acquiring competence and/or market share. The twin-region should be developed by acknowledging its needs of internal logistics and potentials for international business. The region has great potential to cooperate in attracting multinational companies to invest as well as to locate their regional headquarters in Helsinki-Tallinn region. The potential is based on complementary strengths in business environments.

Companies in the region choose their location according to various parameters, one important factor being the quality of living environment for the families of professionals. Labor costs and consumer price differences are not the only driving force of business development in the region. Particularly small and medium sized enterprises offering B2B services often follow big international companies.

Well functioning transport connections to St Petersburg as well as to Central and Eastern Europe are important for the region. When concerning the Helsinki-Tallinn region only, reliable and frequent traffic enables smooth supply chains and service deliveries needed

by businesses. In business-related mobility transport of private cars in passenger ferries is important and foreseen as a growing form of mobility.

Main topics of discussion

- Key drivers of business integration. Location of enterprises, cross-border clusters and intra-industry trade in the region.
- Responsibilities and possibilities of cities in facilitating the development of common business region and twin city public services.
- Implications of shorter travel distance between Helsinki and Tallinn to the competitiveness of the region, including daily commuting as the critical prerequisite for exploiting maximum added value from the twin-city relationship.

Recommendations of the FG to the public sector decision makers

- Travel time between the cities is too long for daily commuting. Progress is needed in shortening the travel time including public transport and other land connections from the terminals, making the travel experience more convenient and schedules more frequent for business travelers.
- Helsinki and Tallinn should start joint promotional actions to attract international investments to the region.
- A common vision on regional development and coordinated plans and priorities in infrastructure development would encourage businesses to grow and cities to attract foreign investors.

14.2 FG Urban Planning

Focus group Urban Planning considers that it is important to exchange information on land use planning and transport solutions in the twin-region. Some decisions made in one city have strong influence on the other city by complementing or overruling or devaluing investments there. This particularly applies to development of ports and their land connections.

Development of passenger ports has been the focus of discussion set within the parameters of spatial planning and connectivity between these city-regions. Helsinki and Tallinn see tourism important for the city centers, but the increasing car and lorry traffic on passenger ferries is a thread for urban environments in Jätkäsaari in Helsinki and in the Old Town of Tallinn.

Urban planning regulations and practices are different in Helsinki and in Tallinn, but both cities face many similar problems. Helsinki aims for a compact city, high-density, with the emphasis on a quality public transport system and a policy for an energy-wise city with a sustainable environment. It recognizes that the metropolitan area is the economic

driver of development and good connectivity between the transnational city-regions is interdependent with managing of growth and achieving spatial cohesion.

Tallinn Development Strategy also supports development of a compact city and effective exploitation of existing infrastructure, foreseeing densification first and foremost on brownfields. Sustainable development tendencies as increasing the role of public transport and rational use of energy and resources are supported. Effort is put into stopping urban sprawl and creating conditions for re-urbanisation.

The Tallinn metropolitan region is acknowledged as a promoter of the Estonian economy especially for its important role in creating international connections. Therefore well-regulated and optimally planned transport infrastructure is vitally important.

To develop and implement urban planning measures in a synchronized way, it requires close interaction between city planners and mutual learning on each other's planning systems and practices.

Main topics of discussion

- Joint planning between ports and urban planners in development of public transport as a means to achieve balanced growth and spatial cohesion: development of ferry terminals as part of an overall urban transport and living environments planning policies to improve both cities and their regions.
- Helsinki-Tallinn transport system where the cities are connected through a) ferry terminals b) cargo harbours c) airports and heliports, and in the far future d) railway tunnel for passenger and freight trains.
- Land ownership, real estate interests and differences in planning systems.

Recommendations of the FG to the public sector decision makers

- A common platform to share plans and strategies of urban planning in Tallinn and Helsinki should be created and cities should agree on informing and consulting each other with the long-term aim of achieving planning convergence.
- The possibilities to move part of Helsinki-Tallinn cargo transport on passenger ferries to operate from Vuosaari port in Helsinki to Muuga port in Tallinn should be studied and considered. As the number of cars on ferries will grow anyway, the passenger terminals need new capacity for their road connections or synchronized policies to increase use of public transport.
- The ferry terminals need improved public transport connections especially to rail and air terminals in both cities, especially by the time when Rail Baltica start to operate to Warsaw and beyond.
- Feasibility of cargo and passenger railway tunnel between Tallinn and Helsinki should be studied with focus on urban structure, land use and transport systems of

the region. Besides aspects of transport system, this study should address impacts on political and economic integration of two functional urban areas.

14.3 FG Transport

Focus group sees that future changes in transport business need common consideration especially in port operations inside the Helsinki-Tallinn region. Current frequent and reliable cargo logistics inside the region, offered by the fast passenger ferries, is important for business development. Passenger transport serves many interests and it is not only the shortest possible travel time, which is important for the customer. Leisure time travelling is the dominant mode and will be so for a long time ahead.

Realization of the Rail Baltica from Berlin to Tallinn will bring new potential transport connections, but this is for the future. Today, freight transports originated from Finland cannot use existing railway connections, there is no intermodal services provided. Viable solutions to remove freight from lorries to rail transport do not yet exist.

There are many uncertainties in the future development of transport business. Cargo flows are fast to move to the cheapest and most flexible modes and routes. Separation of cargo and passenger transport to dedicated harbours, i.e. changing the present concept of fast passenger ferries into ro-ro line Vuosaari – Muuga, and leaving only passenger ships to operate between Länsisatama – Vana Sadam, this is difficult to realize as it requires changing of fleets of shipping companies. This structural change takes time and would need strong political decisions and public support. Combination of trucks and passengers on fast ferries is today still the most economic concept. Probably, separation of passengers and freight would mean higher freight tariffs and ticket prices.

Main topics of discussion

- Alignment of Rail Baltica; location of rail terminal in Tallinn and its public transport connections to Vana Sadam; road connections to Vana Sadam.
- Finnish rail network and public transport connections from West Harbour to the center of Helsinki as well as to the Helsinki airport; technological development in transport due to rising energy prices and environmental standards.
- Geography of future transport flows, competition of ports, transport corridors.
- Vision of rail tunnel Helsinki-Tallinn; its transport economic feasibility; its connection to Finnish and Estonian railway networks, interconnections to metropolitan transport networks.

Recommendations of the FG to the public sector decision makers

- Shipping companies operating the Tallinn-Helsinki route should have stable or predictable operating environment in terms of public policy measures by the ports, cities

and state agencies. Otherwise transport operators cannot develop their business strategies and make long term investments in a feasible way.

- Different needs of cargo transport and passenger transport should be taken into account. Passenger transport needs direct connections from center to center, including growing number of passengers' cars onboard. Freight transport can be served by ro-ro as well, but combined transport in passenger ferries provides better frequency and lower tariffs, at least in the short run.
- New decisions on transport solutions by the public authorities should not limit growth of business interaction and economic growth in the twin-region.
- Feasibility of a cargo and passenger railway tunnel between Tallinn and Helsinki should be studied.

14.4 Conclustions of the focus gropus

Conclusions from the focus groups' recommendations to the next phase of working out the Roadmap of H-T transport system development was summarized in the following seven recommendations addressing directly transport development:

1. Travel time between the cities is too long for daily commuting. Progress is needed in shortening the travel time including public transport and other land traffic connections from the terminals, making the travel experience more convenient and schedules more frequent for business travelers.
2. The possibilities to move part of Helsinki-Tallinn cargo transports on passenger ferries to operate from Vuosaari to Muuga should be studied and considered. As the number of cars on ferries will grow anyway, the passenger terminals need new capacity for their road connections.
3. The ferry terminals need improved public transport connections especially to rail and air terminals in both cities. Measures to increase use of public transport should be synchronized.
4. Feasibility of cargo and passenger railway tunnel between Tallinn and Helsinki should be studied, including wider focus on urban structure, land use and transport systems of the region.
5. Shipping companies should have stable or predictable operating environment in terms of public policy measures by the ports, cities and state.
6. Different needs of cargo transport and passenger transport should be taken into account. Passenger transport needs direct connections from center to center, including growing number of passengers' cars onboard. Freight transport can be served by ro-ro as well, but transport combining passenger and cargo provides better frequency and lower tariffs, at least in the short run.
7. Any decisions on transport by public authorities should not make barriers to growth of business interaction and economic growth in the twin-region.

Appendix: participants of the focus groups HTTransPlan Focus Group Process

List of Meetings and Presentations

Round September 8 and 21, 2011 in Tallinn

Round October 31, 2011 in Helsinki:

Cargo Flow study on the Helsinki-Tallinn route by Pekka Sundberg
Rail Baltica feasibility study with comments by Ulla Tapaninen
Territorial Impact Assessment by Peter Ache
Towards a common road map by Olli Keinänen
GVA statistics by Urban Facts, Helsinki

Round December 9, 2011 in Tallinn:

Transport project tables and maps, Helsinki and Tallinn
Mobility Presentation by Innolink
Airport study by Anu Rentel

Round February 7–8, 2012 in Helsinki:

Comparative scenarios table
Final Scenarios: Partners in transport, Twin-city, Failed opportunities, New beginning
Projects in Helsinki and Tallinn
FG Urban Planning Conclusions draft

Round April 26–27, 2012 in Tallinn: FG Conclusions

Round October 4, 2012 in Tallinn: The Roadmap presented

Economic flows between Helsinki and Tallinn by Seppo Laakso,
kaupunkitutkimus TA oy
Competing Transportation Chains in Helsinki-Tallinn Route: Multi-Dimensional
Evaluation, Olli-Pekka Hilmola, Lappeenranta University of Technology
The final draft document “Roadmap to Helsinki – Tallinn Transport System”
by Olli Keinänen

Participants

Aalto University, Land Use Planning and Urban Studies Group (YTK)	Ache Peter	Professor
	Heikkinen Jenni	Researcher
AS Tallink Grupp	Fagerström Håkan	Director, Cargo Services
	Liik Tonu	Chief Information Officer
	Stalmeister Janek	Chief Financial Officer
AS Technopolis Ülemiste	Jostov Gert	CEO
Association of Port Operators	Laidvee Erik	Chairman
Baltirail ry	Anttikoski Usko	representative
	Castren Väinö	representative
City of Helsinki	Cantell Timo	Research Manager
	Estlander Ville	Divisional Officer, Rescue Department
	Etelämäki Jasmin	Planning officer
	Gordon Douglas	Architect
	Keinänen Olli	Senior Adviser
	Kivelä Matti	Head of Transport System Office
	Lehmuskoski Ville	Head of Transport Planning Department
	Maartola Minna	Development Manager
	Manninen Rikhard	Head of Master Planning Department
	Mustonen Pekka	Senior Researcher
	Ollinkari Matti	Head of International Relations
	Poutanen Olli-Pekka	Head of Transport Planning Department
	Rosenberg Riitta	Project Manager
	Tapaninen Ulla	Expert in International logistics
	Vähäaho Ilkka	Head of Geotechnical Department

Participants

City of Tallinn	Harjo Andres	Head of Transport Department
	Joonsaar Merike	Project expert
	Kurba Jüri	Head of Infrastructure Division, H-TTransplan project coordinator
	Luts Liivar	Specialist, transport
	Meigas Hedi	Leading specialist
	Märtin Kerttu	Coordinator
	Nigul Tiina	Urban Planner
	Preem Martti	Head of the Comprehensive Planning Division
	Rentel Anu	sociologist
	Repnau Mart	Director
	Savomägi Katrin	Head of Department
	Vahesalu Jaanus	Manager of International Projects
City of Vantaa	Pallasvuo Matti	Head of Master Planning
Eckerö Line Ab Oy	Onniselkä Markku	Freight Director
EKA	Cerrone Damiano	HTTTPS research team member
	Lehtovuori Panu	Professor
	Pau Helen	Researcher
Enterprise Estonia	Liive Valdar	Director
Estonian Embassy to Finland	Siil Imre	Senior Adviser
Estonian Institute for Future Studies	Terk Erik	Professor
Estonian Logistics Cluster	Ago Tiiman	Project Manager
Estonian Ministry of the Interior	Kikas Taavo	Adviser
Geological Survey of Estonia,	Klein Vello	Director
Finnish – Estonian Chamber of Commerce	Mäki Heikki	Chairman, Finesta Baltic OÜ

Finnish Embassy in Estonia	Podramägi Pilvi	Political Officer, Economic & Trade Affairs
	Aleksi Härkönen	Ambassador
Finnish Ministry of Environment, Department of the Built Environment	Rautsi Jussi	Counsellor
Finnish Ministry of Transport and Communications	Nyberg Mikael	Director of Unit
	Hilksa Lassi	
GTK – Geological Survey of Finland	Nenonen Keijo	Regional Director of the Southern Finland Office
	Ikävalko Ossi	
Greater Helsinki Promotion	Shah Sandeep	Head of Investor Development
Harju County Government	Rood Alar	
	Simmermann Kadi-Ann	Adviser of Public Relations
	Kose Kaarel	Adviser
Harju Elekter	Andres Allikmäe	CEO
Helsingin Yrittäjät ry.	Pakarinen Pia	CEO
H-T TransPlan	Lepik Katri-Liis	Project Manager
	Sakkeus Jüri	Research Coordinator
HTG Invest Ltd/Tallink	Saar Eno	Member of Management Board
Metrex	Vuorinen Jussi	Chairman of the Urban Planning FG
Ministry of Economic Affairs and Communications	Moppel Anti	Ministerial counsellor for transport
	Haidak Toomas	
Municipality of Maardu	Letjutšaja Elina	Head of the management department
	Vórno Reedik	Chief specialist of architecture and planning department
Municipality of Viimsi	Haldo Oravas	Mayor
Port of Helsinki	Heikki Nissinen	CEO

Participants

	Mäki Kimmo	CEO
	Eve Tuomola	Office manager
Port of Tallinn	Metsal Hele-Mai	Head of infrastructure development department
	Ringmaa Erik	Chief Commercial Officer
Pro Log	Illimar Paul	
Tallinna Lennujaam	Loik Rein	Chairman of Management Board
Tallinn University	Terk Erik	Professor
University of Turku	Sundberg Pekka	Senior Researcher
Uusimaa RC, regional land use planning	Hatanpää Olli-Pekka	Planning Manager
	Orenius Oskari	Regional Planning Architect
Viking Line	Fagerholm Stefan	Manager of terminal operations
	Backman Mikael	CEO
	Borodenko Inno	Manager

15. Conclusions

*Olli Keinänen, Ulla Tapaninen, City of Helsinki,
Jüri Sakkeus, Tallinn University and Katrin Savomägi, Tallinn City Office*

.....

*In particular, we thank Jüri Kurba, Douglas Gordon,
Valdar Liive, Jussi Vuorinen and Kimmo Mäki
for their expertise and help in working out the final proposal.*

15.1 Roadmap to Helsinki-Tallinn transport system

– Integrated transport and city planning approach

The HTTransPlan project has in its mobility studies showed that business trips, intra industrial freight transport, and especially commuting has grown and shall still grow in the coming years. Ferry travel by car is also increasing and is becoming more and more popular. The majority of trips are still leisure trips, and their growth is expected to continue due to fast growth of Finns in their early retirement age and due to rising incomes and living standards in Estonia. Today the number of one-way trips is 7.3 million per year.

The Via Baltica route for Finnish foreign trade will grow compared to short sea shipping or the Scandinavian route. These trucks, trailers and semi-trailers are carried on Helsinki-Tallinn passenger ferries. The new sulphur regulations for all BSR shipping in 2015 will increase costs of sea transport. This is expected to result in further growth of land transports. Another change factor is Rail Baltica. Freight transport in container block trains is expected to start in 2013–14 and passenger trains between the Baltic countries would start to operate in 2016, according to the resolution of the three transport ministries. Rail Baltic, the fast and direct standard gauge railroad, is at the planning phase. The three Baltic countries together with the EU Commission have committed themselves in planning work aiming to implement this new infrastructure by the year 2022. Rail Baltica is expected to further increase competitiveness of the Baltic route for Finnish exports and imports. In 2010 Helsinki-Tallinn freight transport was 2.8 million tons. Transports serving the local twin-city economy are growing in proportion.

Based on cautious estimations of the Port of Helsinki, growth of the Helsinki-Tallinn route is expected to continue by the year 2022: passenger traffic +13% to reach the level

of 8.2 million passengers; car transports on ferries + 50% to 1,5 million vehicles; freight transport + 60% to 4.5 million tons.

However, the future scenarios (chapter 11) developed as part of H-T Transplan project show – depending upon the scenario variant – that the passenger traffic might grow approximately 50% up to 10–11.5 million passengers and cargo traffic can end up to 4.8–8 million tons.

In any case, it seems that present capacity of Helsinki West Terminal will be in full use within 3–4 years. In Tallinn Old City Harbour capacity limits are wider, but land connections are becoming a bottleneck in both harbours.

In both cities the harbour administrations and city planners are active in solving the problems of ferry terminals' land connections. Ideas and projects in different stages of planning and implementation were first listed, then analyzed and discussed together, and finally worked out into form of common strategies and actions, named the Roadmap to Helsinki-Tallinn Transport System. This document was first drafted by the two cities (transport and urban planners). Then the academic partners of the project gave their inputs: Tallinn university presenting the overall socio-economic scenarios, Aalto University by focusing to assess territorial impacts of two main directions, ferries and rail tunnel, and Estonian Art Academy developing tools to handle large and complicated data on projects, planning strategies and network relations behind them. This phase was carried out in May-September 2012 at meetings coordinated by the work package leader city of Helsinki international relations.

The resulting document Roadmap to Helsinki-Tallinn Transport System was presented to the Focus Groups in October 4th. This final round of stakeholder feedback brought several arguments which have had impact on the final form of the Roadmap.

- Harbour administrations and cities cannot decide on behalf of the markets. They can only take care of providing infrastructural services and remove obstacles of favoured solutions. In case a shipping line would like to take passengers' cars to Vuosaari-Muuga line, then the port should facilitate it. The cities can speak out their favoured direction fewer trucks through the city centers, but the shipping companies take the initiative, if they are assured and harbours provide necessary facilities and services.
- Here in the north with our thin transport flows we cannot separate passengers and freight. But as Tallinn Old Harbour and West Harbour are already close to full capacity, and new investments are needed anyhow, then the possible solution is to move part of the traffic to Vuosaari-Muuga route. Passengers coming with their cars and truck transports could even gain from this move to a route without traffic jams.
- The Roadmap needs to be used for showing how cross-border traffic and its networks is synchronised with the local and regional planning frameworks and plans. Especially the vision for the rail tunnel does make an impact on local city planning. It

might, even as an idea, become an unjustified barrier to overall transport and urban development.

- For studying of the tunnel we need to have open approach on technological innovations and potential new transport systems.
- The tunnel and the ferry based model are not alternatives but should be seen as complementary strategies representing shorter and longer time horizons in the first place.

The Roadmap consists of three strategies and seven actions. Relevant projects and projects indirectly contributing these strategies were also initialized (see chapter 13). First two strategies are actually joint commitments how urban and transport policies are carried out in short term. The main message is that no radical change in the system is pushed by the cities. Third strategy is about the medium and long term solutions to be worked out by the cities in cooperation with the stakeholders. In this work and on the future structure of the transport system major changes are not ruled out.

15.2 Strategies

Strategy 1. Passenger ferry transport and its prerequisites to growth are secured in terms of public infrastructure and regulations

(ropax type vessels carries passengers, small cars, buses, motorcycles, cargo – freight and trailers ect.).

Actions in Helsinki:

- 1.1 Enlargement of West Terminal (by 2016, capacity from 25000 to 45000 passengers/day).
- 1.2 Improved road connections to West Terminal (one more lane from the terminal, and a new connection from Salmisaarenkatu Street to the terminal).
- 1.3 Tram line from West Terminal to the city centre (tram no 9 completed August 2012 and to Ruoholahti metro station tram no 8, by 2014).
- 1.4 Increase public transport popularity (possible actions: combined ferry and public transport ticket, synchronizing public transport time tables and capacities with terminal rush hours, park-and-ride service development).

Actions in Tallinn:

- 1.5 Improved and new road connection from Old City Harbour to Narva Street (via Petrooliumi and Uus-Sadama Street).
- 1.6 Tramline extensions to the Public Transport Centre in Ülemiste (Tram line 4, 2018–2019)
- 1.7 Public transport synchronizing, dissemination of information about traveling possibilities on public transport between Old City Harbour, City Centre and Airport (2012–2013).
- 1.8 Kalamaja bypass (1+1 lane, improvement of west connection from the harbours (2013–14).

Joint actions:

- 1.9 Integrated ferry and public transport tickets and improved information on public transport service for ferry passengers.
- 1.10 Interoperability of public transport cards in the capital regions. (to be discussed)

Strategy 2. Flight connections are secured and improved.

Helicopter- and airplane connections are vital services, especially for businesses. Helicopter service from Hernesaari to Linnahall is the fastest connection and provides good frequency between the city centres. Present locations of heliports are not secured in the long run due to urban development projects in both cities. In Helsinki a new location of heliport in the southern edge of Hernesaari is a likely solution, but the plan is not yet accepted by the Helsinki City Council. In Tallinn the location at the Linnahal is connected to the future of this building, which is still open. An alternative location can be at the airport.

- 1.11 The cities are committed to maintain either present heliports or new heliports in central locations.

Strategy 3. The cities work out a strategic and integrated planning framework to facilitate political decisions on long term development of Helsinki-Tallinn transport system.

Two alternative and complementary directions for facilitating the growth of transport demand in the medium and long term will be studied by the respective planning authorities:

- (A) Ferry based system where terminals and their land traffic connections are in focus; and
- (B) Fixed link between the cities, where pre-feasibility study of a rail tunnel is in focus.

A. Development of passenger terminals and their land traffic connections

Port of Helsinki and Port of Tallinn in collaboration, and in cooperation with the shipping companies, will work out measures to remove part of truck and car transports to operate in Vuosaari – Muuga line. These medium and long term policy measures should be non-restrictive measures to support roro- and ropax transport to use Vuosaari-Muuga line. Planning requirements of passenger traffic in Vuosaari and in Muuga will be evaluated in the short term.

Extension and development of a new terminal to West Harbour includes an idea to integrate leisure and commercial activities to the terminal concept. Development strategy in Tallinn Old City Harbour is very similar.

Growth of heavy traffic becomes a growing problem in both city centres. As traffic volumes, especially heavy traffic grow, problems can be regulated in cooperation with the

shipping companies by developing Vuosaari – Muuga line for increasing truck transports. In the long run containers in addition to trucks and trailers would be environmentally a sustainable solution.

Because the capacity of street network to West Terminal seems to become a bottleneck in the near future, active investigations to find a solution to improve capacity have been started. In Tallinn the capacity problem is solved by constructing of Põhjaväli, either as a road tunnel, or as a lighter planning variant if the major part of future growth of vehicle transport on ferries can be removed to Muuga. West Terminal and Old City Harbour will remain the main passenger terminals also in the long run.

Share of public transport must be increased. Connections from ferry terminals to main public transport terminals and park-and-ride facilities are developed in a coordinated way by the cities.

West Terminal's connections to public transport terminals and park-and-ride facilities will be studied and a rail tunnel Pasila – West Terminal evaluated. Alternative technologies and solutions will be studied as well, including a monorail-line from West Terminal/Jätkäsaari along former harbour railroad to Töölönlahti, Pasila and Kalasatama.

In Tallinn the possible tram network is planned from Old City Harbour to the City Centre, to Ülemiste transport centre (connection with Airport) and to Jüri borough. Instead of a tram or a fast tram this line could be realized with monorail technology. Monorail technology in both cities to connect the ferry terminals would create a strong visual tie and the image of twin-city. Primarily these public transport connections provide for Finns an effective connection to Rail Baltic and for Estonians efficient connection to Helsinki-Vantaa airport.

B. Pre-feasibility study on Helsinki-Tallinn rail tunnel

The cities together carry out in 2014–15 a pre-feasibility study on the Helsinki-Tallinn rail tunnel. This study should provide answers to questions:

1. How the tunnel should be integrated into the overall transport systems?
2. Analysis on variants of alignment is needed as a basis for land reservations in city plans and regional plans. Part of this pre-feasibility study is a geological seismic survey of the sea bottom between Helsinki and Tallinn outside coastal areas.
3. Is it possible to be developed in more than one stage and serve more than one function?
4. Under which economic conditions and catchment areas the tunnel would be a feasible project?

If the pre-feasibility study indicates that the rail tunnel has a potential to become a feasible and viable project in the long run, then in Helsinki it would be possible to consider the rail tunnel Pasila – West Terminal as a first stage.

When freight transports of present Rail Baltica (1520 mm gauge) will start, then future prospects of rail transports can be evaluated based on market information. The rail tunnel would mean more substantial modal change from road to rail in the Finnish international transports. Then reconsidering of the logistic model in Vuosaari Harbour would be needed, including evaluation of possible dry port models and bigger role of container transport.

Rail Baltic will most probably be completed around the year 2022; the decision on its construction is scheduled to be taken in 2015. In Helsinki and in Tallinn the choices of the long term transport system should be made around the same time. Then financing of selected projects improving the Helsinki-Tallinn connection could be applied to the Connecting Europe Facility financing for the period 2014–2020. Helsinki-Tallinn is part of Core Network Corridor no 1, and thus eligible for CEF financing (initially 75% for Estonia and 40% for Finland, 50% for studies).

The next milestone is year 2018 when the EU budget period 2020–2026 is prepared. In case of a positive result of the pre-feasibility study, then the full scale feasibility study and pre-design work of the tunnel could be included in this budget framework. At the time Rail Baltic (1435 mm gauge) will be completed in 2022, and based on the full scale feasibility study (planning and technical requirements, information on impacts and economic assessments, cost benefit analysis) – then the choice can be made around year 2023. Whether there has grown political will and the studies provide arguments for the tunnel with its high prospects for cross-border integration and economic growth, or should we focus to improve and develop present ferry system to better serve growing twin-city economy and the Finnish transit transports.

15.3 Joint actions

The Roadmap consists of cities' own actions and such actions which should be carried out either jointly or in close coordination manner. During the HTTransPlan project's life time it was possible neither to prepare these actions and projects any further, nor to carry out careful coordination with the frameworks of municipal budget planning, or communicated with all stakeholders of transport policies concerned. The following seven projects are suggested to be investigated.

1. Integrated ferry and public transport tickets and public transport information for ferry passengers
Description: Agreement on ferry tickets (boarding cards) being valid in local public transport for a certain time. Ferry companies, public transport providers and the cities should agree on a system of validation and cost share. If validation becomes expensive to fit into present systems, then second option is to use the public transport cards using same standard. Information services on public transport on the web, at the ferry terminals and onboard are much easier to improve.

2. Interoperability of public transport cards in the capital regions
Description: Tallinn and Harju have adopted in August 2012 a public transport card using same standard as Helsinki Region (HSL) has decided to take into use in 2015. Based on the common standard it is possible to develop cooperation and interoperability in public transport.
3. Development of Vuosaari – Muuga cargo traffic
Description: All measures to promote future growth of cargo traffic to use Vuosaari-Muuga line shall be investigated. These measures can be improvements in Vuosaari and Muuga (including their hinterland connections), e.g. operational and traffic regulations. Implementation of any measures depends on actual growth of cargo transports. Possibilities for ropax traffic shall also be investigated.
4. Coordination in developing hinterland connections from ferry terminals to main public transport terminals, park-and-ride facilities and to the highway network
Description: All projects and policy strategies are assessed together between the cities aiming to develop a balanced strategy, including cost estimates, and which is also communicated with the local and regional land use and traffic plans. First phase is that both cities work out evaluation of their existing projects (For Helsinki part this is carried out as part of HTTransPlan). The work and results are coordinated with the joint action no 5.
5. Commitment to secure heliport services for helicopter line to operate from the present heliports or from new and equally central locations
Description: Mutually the cities commit themselves to maintain present well functioning heliport service for regular passenger flight traffic. And in case the heliport should be resolved they commit themselves to provide similar service at another central location.
6. Pre-feasibility study on the Helsinki-Tallinn rail tunnel
Description: Carry out a study on economic and social benefits of a rail tunnel, its impacts on transnational transport system and transport economy, its cost estimates based on mainly existing geotechnical data and on benchmark projects. Impacts on regional land use are evaluated resulting alternative alignments of the rail tunnel and its connections to national rail networks. The work and results are coordinated with the joint action no 3.

15.4 Implementation and challenges of governance

Our project focused on joint challenges in Helsinki and Tallinn transport and urban planning. Transport system is the backbone in development towards the Twin-City. The wider concept of Twin City covers all spheres of urban regional development, business, culture, education, health care, civic societies and social relations. Tallinn and Helsinki

interrelations have developed to the critical level where a common vision is needed. This was a repeated message from both sides during the process of Focus Groups. The vision has to give us joint understanding on the common future we want to build, as well the strategic guidelines for major efforts. For instance if our common vision for the next decades would be to develop Helsinki-Tallinn region as a leading growth centre in Northern Europe, then it helps us to set priorities and guidelines in planning of joint initiatives. The Vision will act as a catalyst and framework for cooperation between local, regional and national authorities and private sector. The key question remains: who should do this or lead the process?

Is informal co-operation between city planning authorities enough or should there be some form of organised cooperation? There has already been established a joint steering group for ports of Helsinki and Tallinn. The challenge of how to implement the common Roadmap was a central topic at the final focus group meeting. In general, all the stakeholders seemed to be on the opinion that some form of follow up or preparatory structures should be established to strengthen official level informal exchange among transport and planning specialists. Stronger political guidance was also called e.g. in form of twin-city ombudsman or one deputy mayor being responsible for twin-city issues. Doubts were also presented, pointing to the fact that our political systems and planning legislations are so different. There is still a lot of work to do in developing technical and specialist level collaboration on the content of twin-city urban development, and on transport system integration especially. Any political coordination arrangement cannot work without support provided by the specialists. The ICT tool Decision Support System developed in the project (see above chapter 13) could become such a support structure.

Until today NGO Helsinki-Tallinn Euregio has served that purpose of enhancement of cross-border integration between Helsinki-Uusimaa region and Tallinn – Harju County. This organisation with its political representatives in the management board, civil servants in the secretariat and office in Tallinn, has for the past 9 years assisted cooperation inside the twin-region. H-TTransplan is one of projects managed by Euregio.

This cooperative work on the Roadmap has showed that both cities do have a lot to win – and to lose, too. Cross-border transport systems are part of the metropolitan transport networks in both cities. It was found out that in both cities majority of metropolitan scale transport plans were also interconnected with cross-border connections and parallel projects or policies in the neighbouring city. If Helsinki promotes public transport services to the terminal by expensive investments, then in Tallinn same policy should be implemented, or the investment in Helsinki cannot be effective. People do not leave their car home if public transport service to ferry terminals is good only in one city. Actions and measures should be synchronized for the sake of policy effectiveness and consistency.

To ensure consistency in implementing of projects and initiatives presented in the Roadmap of Helsinki-Tallinn Transport System Helsinki and Tallinn regions' authorities have

to agree in coordination principles and processes. For instance project planning/reporting meetings 2–4 times a year with agenda as follows:

- Information exchange on political-, economical- and social issues;
- Reports on implementation of the Roadmap projects in both regions;
- Goal setting for the next period (3–6 month) and changes in long term plans (if needed).

The ownership of the coordination process could be held in turn by Tallinn and Helsinki at deputy mayor level.

One reason for coordination and common strategies is in financing of transport projects from the EU programmes. In fact, schedules of these financing programmes more or less dictate our project preparations. Helsinki-Tallinn connections are part of TEN-T core network corridor no 1. Helsinki-Venice. Connecting Europe Facility is prepared to become the main financing instrument for development of these corridors for the period 2014–2020. Preparing projects eligible to apply takes time and requires coordination. Helsinki-Tallinn multimodal transport connections concern several actors and stakeholders. Spatial planning (regional, local), transport planning and transport operators (public and private), harbour and airport administrations, transport policy makers (state, region and local), business development agencies (state and local level) – all them should be involved.

In this exercise of Roadmap to Helsinki-Tallinn Transport System we have learned how complicated it is to put these actors into cooperation. Our governance systems are different from each other. Starting with deputy mayors' responsibilities which do not coincide, and organising of urban and transport planning (one or two departments), city strategic development and business development (centralised or de-centralised), or ownership of harbour administrations (state and municipal), relations between municipalities and regions, etc. – our two cities and regions are governed in very different ways. So, no wonder it is hard to create a balanced joint working group for any purpose. But it is worth of trying, a necessity for both cities in the long run. Benchmarking with other cross-border metropolitan regions definitely is worth of effort and a good tool for joint learning. BSR TransGovernance (started 10/2012) is a project where Tallinn and Helsinki will carry out such benchmarking with the Öresund region.

15.5 Future research needs

This report presents a comprehensive summary of the studies of passengers, cargo and economic flows between Helsinki and Tallinn. However, HTTransPlan-project carried out an extensive set of mobility studies and compiled scenarios giving us general understanding about the drivers behind, but more detailed studies are needed for understanding the dynamism behind moving people, freight and money. We have now much better understanding what is happening, but not much more about reasons, whether they are economic drivers, structures or network relations. We now have better description of the

twin-city, but not yet explanations why it is developing this way. This kind of twin-city research would be valuable for those policy makers who intuitively believe that Helsinki and Tallinn together could do better, but needed also by those who tend to see our relations more competitive than cooperative.

This report gives a good understanding of the present state-of-the-art of available statistics, but many parts are still missing and they should be continuously followed with care. A comprehensive statistical passenger, cargo and economic flow analysis should be started. Follow up of mobility should be organized on permanent basis, at least statistics of passengers and freight flows which now are available as part of national statistics and defined as part of Eurostat standards, should be added by information justified from the twin-city perspective. Commuting behavior, business networks, immigration and second homes, values of cargos, intra-industrial freight flows, etc. are topics where more detailed statistics is needed for twin-city research and for policy makers.

One of the main questions behind these studies was, why people and cargo travel between Helsinki and Tallinn. It was found out that people use quite much money on their trips (chapter 2), they mostly take ferries and only 3% are taking a flight (chapter 3), both Finns and Estonians travel because of work and holiday, and both are going also to other countries, Finns use mainly Via Baltica and Estonians Helsinki-Vantaa airport (chapter 4).

A careful reader can see immediately that the number of passenger in the various passenger studies do not summarize up to equal numbers. Finnish Transport Agency collects the total number of passengers on vessels, which can be regarded as a very reliable figure. That was over 7.3 million passengers in 2011, which means 3.65 million for both directions. When looking at figures in Tartu University in chapter 4 calculated by mobile positioning techniques, the figures come very close to that: namely 1.37 million Estonian mobile phones and their owners visiting Finland and 2.52 Finnish mobile phones and their owners visiting Estonia. It is understandable; some people have more than one mobile phone. But on the other hand, people may have several phones, one only for Estonia and one for Finland, so they may not be registered as travellers in this study at all.

When we look at figures of Statistics Finland, there is only 2.34 million Finns visiting Estonia and 0.71 million Estonians visiting Finland which comes only up to 3.05 million visits. These figures do not include truck drives that may come up to 230 000 travels. There is also a considerable number of people from other countries onboard the vessels that are not in the figures of Statistics Finland. But a considerable amount of people, in particular Estonian people, are missing from the figures of Statistics of Finland. It is very much needed to have a comprehensive view of total number of passengers and their nationality, and reasons to travel.

The number of trucks and trailers between Helsinki and Tallinn is also known very exactly from figures of Finnish Transport Agency (chapter 6). However, it is not known exactly what kind of cargo do they carry and what are the traffic patterns, but some ideas can be

found from the interviews (chapter 7). Also an interesting calculation of environmental effects of various transport modes are calculated, but their influence on traffic pattern still remains un-known (chapter 8). The more in-depth view of the volumes and routes and contents of the cargo transport is needed.

The business environment in both countries is presented, but unfortunately the number of interviewed companies is small and the statistical information is partly missing, so that total view is still to be found (chapter 9). In particular, the influence all kinds of non-registered business and working is only a guess, but their share can be considerable. Also a statistical analysis of the economic flows between Helsinki and Tallinn is presented in this report (chapter 10) but due to the problems presented above the data may be biased.

In addition to getting comprehensive understanding on mobility and reasons behind, further studies are still needed to keep focus on Tallinn – Helsinki spatial cohesion challenges, and possible strategies. As well as studies on public and private real estate development plans and assessment of impacts are important to carry out. For the joint investment planning and other economical decisions in depth study on economic flows and cooperation patterns between Helsinki and Tallinn would be needed.

Finally, after the H-T transplan project is finished it would be critical to keep the knowledge platform functional and developing. It means the need for ownership and financing of the knowledge platform, purposeful marketing and extension of content and users groups. Helsinki and Tallinn as a twin region has a great potential to become a leading Growth Center in the Baltic Sea Region. To support the development, the continuity of joint studies, cooperation in planning and implementation are needed.

