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Smart Mobility: Analysis of travelers´ mobility expectations

Case study: Helsinki West Harbor and Helsinki-Vantaa Airport

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This thesis research was influenced and based on the results of the "Last Mile" project. The goal of the project is to study smart mobility solutions and their applicability in the Helsinki Region. The project is funded by the European Regional Development Fund as part of the Six-city strategy for years 2017-2019. This thesis is based on travelers´ mobility expectations in the Helsinki region. It will provide knowledge on the sustainable mobility possibilities and obstacles from travelers´ perspective.

To investigate the travelers´ expectations, a literature review was conducted on smart mobility, traveler's behavior and tourism. Finland as an operational environment was also researched. The literature study attained knowledge, which gave a basis to conduct further research on travelers´ expectations. Research data was collected with help of several surveys.

Surveys were conducted together with other project workers in the "Last Mile" project. The areas of research were Helsinki West Harbor 2 (Jätkäsaari Terminal 2) and Helsinki-Vantaa Airport. Thesis author took part in both surveys, as well as, in the analysis process of the results and the evaluation.

The analysis of travelers' expectations showed, that the majority of respondents are satisfied with the mobility services provided in the Helsinki Region. It was noticed that travelers still expect to use the outdated methods of transportation and payment. Modern services, like a car- and ride-sharing were rarely mentioned and many shared a negative attitude towards them. This, however, could be affected by the background of the respondents.

The research author found that travelers are lacking awareness of the available service, which limits their mobility and travel experience. Tourists expect to have flexible, easily accessible and mobile services, however, they do not obtain the information on where or how to get such services.

As an outcome of the research, several smart mobility solutions are recommended. The services presented would improve the travelers´ mobility experience in the Helsinki Region. Recommended solutions are based on the improvement ideas from the travelers.

Keywords	Sustainability, Smart Mobility, Sharing Economy, Urban Planning, Smart City, Last Mile, Trends, Traveler's expectations, Traveler's behavior.

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1   Introduction

In recent years, the most common use of the sustainability term is considered as the management of natural resources to reach the ecological balance. The Oxford English Dictionary, on another hand, defines sustainability as "the ability to be maintained at a certain rate or level". "Sustainability is a balancing act" (Sustainability Degrees 2018). In other words, sustainability is a long-term, constant growth and continuous development.

Nowadays sustainability is an important focus area of all companies in all industries. According to the Knut Haanaes (2016), around 84% of executives believe that embracing sustainability would increase the competitive advantage either now or in the future. Furthermore, it is proved that a sustainable approach is fostering the company's longevity, which is one of the prior goals of any business. It is no longer optional whether to apply the sustainable strategy or not, it is a must.

To be sustainable, any industry should be adjustable to trend changes and be keen to utilize such changes as benefits. Tourism is one of the leading industries which is currently facing an innovation revolution (Johansson 2016). Consequently, the sustainability issue is undoubtedly the factor to focus on in travel industry. New trends and innovations primarily include developments in smart mobility solutions and mobile services, which were defined by customer demand. Consequently, a hypothesis is developed where in order to maintain sustainability in travel mobility sector customer expectations should be met.

Moreover, since mobility solutions do not require a lot of time and resources to be created and maintained, the mobility sector offers a great opportunity for small and private companies to start their business journey. Although the demand for such solutions is trending and booming, only about 40% of such companies will make it through the fifth year in business. There is a chance of 42%, that business activities will fail to fulfill the customer needs since there is no market for their products or services. Interestingly, only 25% of the companies have successfully incorporated the sustainability into the company operations (McIntyre 2018).

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Consequently, it is possible to conclude that since the mobility sector is successfully developing and changes, it will benefit from the research on customers' needs. It will give the basis for offering services or products.

1.1   Background of the "Last Mile" Project

The research idea was largely inspired by the "Last Mile" project, which began in September 2017. The main goal of the project is to improve the mobility services of the so-called "last mile" by testing and applying new smart mobility solutions in the Helsinki Metropolitan area in Finland. This is a joint project of the city of Vantaa, Espoo Marketing, Forum Virium Helsinki, Metropolia UAS, Aalto University, and Demos Helsinki. The "Last mile" is funded by the European Regional Development Fund through the "Six City Strategy" during 2017-2019. (Metropolia 2018).

Metropolia UAS is a research agent for the "Last Mile" project. One of the objectives so far has been to make research about the travelers´ needs and perceptions in the mobility sector, as well as to conduct a benchmarking study on the sustainable and efficient means of mobility solutions around the world. The areas of research so far have included Jätkäsaari area of Helsinki, Aviapolis Vantaa, Helsinki-Vantaa Airport and Kuusijärvi recreational area in Vantaa, Nuuksio Natural park and coastal areas of Espoo. Research projects by the Metropolia project team, which are utilized in this thesis, were conducted from February to May 2018 (Metropolia 2018).

The thesis author was intrigued to investigate the connection between tourists expectations and existing mobility offerings in response to such expectations while she working as a project assistant for Metropolia UAS in the Last Mile- project spring 2018. A research on travelers´ expectations was conducted in February 2018 in Jätkäsaari in cooperation with Forum Virium Helsinki. Another research was conducted in March 2018 at Helsinki-Vantaa Airport in cooperation with City of Vantaa. Both areas have a great volume of European and Non-European tourists. The project manager of the Metropolia UAS team, as well as the thesis supervisor, Kaija Haapasalo, encouraged the thesis author to conduct a study helping to understand how businesses can apply the sustainable smart mobility solutions successfully and what obstacles have to be considered in the target areas of the Last Mile project.

1.2   Objectives and scope

The main purpose of this thesis is to investigate what tourists expect from the mobility services in Finland metropolitan area and what sustainable mobility solutions might be offered in response. Discovering the needs and perceptions of the tourists on their travel experience is the first research target. Another target covers the research on sustainable solutions and recommendations for the Finnish mobility industry. By conducting the study about the travelers´ needs and presenting the conclusions, this work will provide an overview to mobility service companies operating in Finland and recommend some future development ideas.

Currently, the cities of Helsinki and Vantaa are eagerly looking towards applying innovative smart solutions in the mobility sector, in order to make desired destinations for tourists and residents more accessible. Jätkäsaari is expanding and developing its surrounding area by building new residential, leisure and office facilities. The Helsinki-Vantaa Airport is an essential actor in the Finnish cargo and passenger traffic, consequently, further developments in mobility would increase the potential use of many surrounding services.

Both areas are keen to fund and support the small and private businesses, which aim to improve the movements and logistics within the capital area. This is the reason why they are participating in the Last Mile project. A small business may utilize market research conducted in this work as a basis for offering their mobility products and services within and outside the capital area of Finland.

In order to fully disclose the research topic, it is important to understand, how tourists conduct the decision-making process and what affects it. Furthermore, it is important to research the mobility market locally and globally. As a result, this work will approach questions like:

What is defined by smart mobility and what it involves?

One of the current trends within the urban mobility planning is Smart Mobility. The answer to this question will provide the knowledge on an overview of this term by defining its meaning and features.

What are the tourists´ expectations and preferences for mobility options?

The answer to this question will provide an understanding of travelers´ behavior and the travel decision-making process. The analysis presented in this section would disclose the opportunities and obstacles that mobility services may face referring to the travelers´ needs. It will also give insights on what travelers have utilized and would be keen to consider in the future.

What mobility solutions might be recommended to be offered to travelers in the Helsinki Region?

With help of this question, the author is hoping to be able to recommend how to combine the possible mobility solution with customer expectations in the Finnish capital area.

1.3   Methodology

This research uses the descriptive method of investigation. Since the prior target is to find out the traveler's needs, human nature plays the key role. The main approach to the research is defined as qualitative. Such an approach is commonly used in social and business studies since research variables usually affected by the unpredictable human nature (Freeman 2017). Nonetheless, quantitative research was also delivered to conduct the statistically significant evidence and outcomes of some variables. Moreover, this research utilizes both primary data research and empirical analysis, as well as, theoretical information gathered from secondary data sources.

Primary data research was conducted from February to April 2018 in form of surveys and interviews with tourists leaving the capital area through the ferry terminal (Jätkäsaari) and through the airport (Helsinki-Vantaa Airport). The tourists´ segments were defined to be European travelers and Non-European travelers. The ferry terminal and airport survey questions are presented in Appendices 1 and 2. Questionnaires were presented in a paper form, as well as through mobile tablet. The emphasis was put on the open-end questions, which primarily were performed in the interview format. Other questions might be filled out independently by the interviewees. The survey was always voluntary and anonymous. The sampling method was delivered through a random sampling method. The sample size at Jätkäsaari was set to 100, and at the airport, it was set to 200.

The survey goal was to approach tourists who had their first or at least second travel experience in the Finnish capital area. Since their expectations and experience on the mobility services were still clear and fresh, they had the most potential significance for the research. Furthermore, the important feature of travelers is their subconscious comparison of any feature to their home country. Consequently, travelers have a wider scope of services and solutions to refer to. Travelers who were regularly visiting Finland or Finnish residents were excluded from the interview. It is worth to mention, that interviews were conducted in the least demanded travel season for one week in February 2018 in Jätkäsaari and during several weeks in March 2018 at the Helsinki-Vantaa Airport. Terminal and airport authorities kindly allowed the research team consisting of several Metropolia UAS student members to conduct the research. The contribution of all the team members is very appreciated and noted in this work.

Empirical data analysis was conducted through the careful analysis of the tourists´ needs and expectations. Expectations input was in the qualitative format. Thus, such data has to be recoded to the quantitative data format through the Excel and SPSS tools. The assessment of the answers was delivered through the Public Transport Passenger Rights and Quality of Service EU Standard - UNI en 13816. Further analysis and evaluation utilized the logical and deductive approach to presenting the outcomes of the data. Primarily, the evaluation approach was delivered through the lenses of the triple bottom of sustainability: how services impact social, environmental and economic aspects. Which evidences how sustainable the potential solutions are. The deductive approach was delivered through the observation, travelers and personal experience and assumptions.

The research paper is delivered through 7 Chapters. The first introduction chapter delivers the motivation and purpose of this work. It presents reasons why the objective was set and what questions would be further answered. It also presents the methods and limitations that were utilized in this thesis work. Chapter 2 presents the insights on Smart Mobility. Moreover, this chapter mentions other definitions like urban planning, smart city and sharing economy. Chapter 3 presents the current trends in the sectors of tourism and mobility. It presents the general global trends and economic shifts. Chapter 4 provides insights into Finnish tourism, mobility, and economic sectors. Additionally, this chapter includes transportation regulations that are currently legal in Finland. Chapter 5 includes the theory on how the travelers behave and make their decisions, which helps

to evaluate further research. Through chapter 6, the main body of the research is presented. The survey process is described, and the final results evaluated. Recommendations and conclusions are present in Chapter 7. It combines all the conducted literature research results from the Chapters 2 to 5, and the results from the surveys from Chapter 6.

1.4   Limitations

The study has several limitations to pay attention to for further references. One of the greatest limitation is the geographical location, in which the primary research was conducted, and on which the final analysis was focusing on. Although it covers capital cities like Vantaa and Helsinki, other cities may not be considered as an equivalent to them. Furthermore, Finland is not as overpopulated than other cities like Singapore or Amsterdam. Consequently, when approaching this study, it is important to keep in mind the relationship between the city density and the tourist's flow.

Another limitation, that significantly affects the study circumstances, is time. The urbanization planning, with each year, becomes more relevant in the majority of steadily expanding cities. Mobility services and smart solutions develop accordingly. Consequently, the mobility sector is fast moving and rapidly changing industry, meaning that sources of information are updated regularly. Furthermore, the solutions being created fast and easy. Consequently, the relevance of the thesis recommendations is short term.

Moreover, time was a constraint in the process of the questionnaires. Surveys were conducted within one or three weeks. Accordingly, the tourism feature could not be approached correctly and fully, since in the industry it is important to consider the seasonal changes. (Becken 2010: 4). Although the research sample size is significant, it would be more valuable to conduct research over a few seasons. Weather conditions affect the tourist's decision making, which is why the research outcome is not as accurate as it could be.

Moreover, the primary source of data were tourists, excluding local residents and capital area commuters. Notably, the majority of terminal visitors were Finnish citizens, who might be also valuable to consider. Although, their contribution to the thesis subject was ignored, still, urban planning aims to fulfill the needs of every stakeholder, including residents. Further developments in this field require more time and resources to approach

each stakeholder. Unfortunately, due to the research time and human resources constraints, conducting the survey aiming at residents was impossible.

Besides the mobility services usage importance among the local residents, other customer segments actively use the mobility services and should be acknowledged in research. Such segments are elderly population, travelers with kids and people with disabilities. The chance that such customer segment among Finnish travelers would be caught is small. This limitation makes the traveler's expectations research narrowed down. Which is why the outcome of the research is relevant to a specific traveler segment.

Another limitation that affects this research paper is the research validity and reliability. Such features are significant in scientific research. However, the social sciences must refer to its relevance to support its value. Reliability stays for the fact that conducted research or experiment (survey) may be repeated and reproduced. Validity implies the accuracy of research itself and its results (Curtis 2011:73). The surveys process is presented in chapter 6, which explains in detail the circumstances in which the study was conducted. As a result, the reliability of the research could not be reproduced with 100% accuracy, however, close circumstances might be achieved. Whether the validity of the research is compromised. The research outcome is based on the literature review and personal interpretation of the results by the thesis author. Individual limits in knowledge, experience, and views might limit the outcome of the thesis. Moreover, there is no similar research conducted on the subject of the traveler's expectations on mobility services. As a result, there is no reliable comparison to refer to.

2   Smart mobility and tourism

Nowadays smart services are seen everywhere in tools such as Smart Phone, Smart TV, SmartWatch et cetera. The definition of the term is relatively broad. Smart is a fashionable term for describing anything modern, clever and intelligent, one says (Anthopoulos 2017: 5). Other perceive Smart as an efficient and multimodal system or device (Bolivar 2017: 36). It is possible to conclude, that "Smart" is a technology dependent and a complex concept of a multimodal approach to the intelligent solutions.

The technology dependency implies the ability of services to access, collect, exchange, analyze and process digitalized (Big) data. This ability creates a virtual connection between different types of information and devices. Many people are probably not aware of what degree their devices are connected (Brown 2017: 2). This connectivity builds a complex framework of related services and products. Meaning, that several services might be combined in one product, and such services might be available from several products as well. Smart services utilize the multi-functional approach, which makes services accessible from connected products.

Nowadays the „Smart" concept became so evolving, that it is already been utilized in major and large-scale projects as Smart City planning. Smart City is the combination of smart services and urban planning. Urban planning is a concept of improving metropolitan accessibility and efficiency (Un-Habitat 2013: 2).

Smart City concept is a glance to the future of sustainable urban planning. Smart City is a „strategic, systematic and coordinated implementation of modern ICT applications in a range of urban functional ecosystems" (Song & et al. 2017: 3). Such ecosystems include mobility, living, environment, society, economy, and government. „Smart is what best serves people within the city: sometimes nudging them, sometimes responding to them, but always progressing forward" (Neckermann 2017: Chapter 1).

The greatest contributor to the Smart City is the Smart Mobility (STA 2018). Cities become more populated, noisy, congested and slow. It impacts the means of providing the services and goods, which are crucial for economic life. More of that, mobility impacts local commuters and employees, whose living standards and satisfaction also influence economic life (McKinsey 2016: 5-7). Future depends on sustainability, hence, Smart Mobility is „a tool to achieve sustainable development" (Hessel 2015: 4).

2.1 Smart mobility

The term „Mobility" also has many meanings and applications. However, this work will consider the term of the Oxford Dictionary as „ the ability to move or be moved freely and easily between different spheres of use". Meaning that mobility is a convenient and flexible movement of both information and objects.

To fully define the mobility meaning, the comparison to transportation should be presented. Transportation is a set of physical objects (motorized vehicles) that change their position in a physical space (Sarkar & et al. 2015: 1). While, mobility is any type of movement in unlimited space through unlimited types of objects (including people, goods, services, vehicles, and information). As a result, it is possible to see that transportation is a part of mobility. Thus, smart mobility is an intelligent and technologically advanced transportation of people, goods and information within the connected environment. Technology innovations, sensor and navigation systems, connected environment through the Internet of Things (IoT), advanced services through the Internet of Services (IoS), augmented reality, visualization, robotization technologies are the tools of future mobility – hence smart mobility (Flügge 2017: 2).

Nowadays, the urban area accessibility issues extending with each year due to the increasing numbers of private car users and increasing demand on the land nearby the metropolitan area. Consequently, metropolitan areas become more populated and infrastructure should be accordingly adjusted (Sustainable Mobility for All 2017: 16). The essential target of the smart mobility concept is to offer mobility stakeholders an efficient, smooth and flexible mobility services. Undoubtedly, smart mobility is one of the most effective sustainability tools. smart mobility is benefitting the environmental and economic development of cities, as well, as benefitting social sectors.

Benefits of smart mobility implementation might be evidenced in The Guardian article (The Guardian 2018). It shows the advantages of bicycle usage in Copenhagen. In 2016, there were counted more bicycles than cars, exceeding more than 10 000 units. Additionally, the journey to the core city center facilities on the bike was shorter by nearly 25 minutes, in comparison to a car journey. The reason lays in bikes possibility to drive flexibly, whether car journey considers detours. As a result, the bike is the fastest transportation mode inside the core of a dense city traffic. Through many other pieces of

evidence, the article influencer Mikael Colville-Andersen proved, that bike is the perfect mobility solution for an urban last mile problem.

People satisfaction is the main resource that needs to be highly prioritized. Accordingly, the Smart Mobility scope is built around the solutions that people would potentially keen to utilize. The scope of smart mobility solutions includes any type of motorized and non-motorised vehicles. It consists of bicycles, scooters, cars, buses, trains, et cetera. Another type of mobility is walking, since it is still the most environmentally-friendly, healthy and cheap mobility option. Furthermore, in a range of smart mobility options are included mobile services and software platforms. Platforms defined as software applications, which allows utilizing certain services. Services are considered as journey planners, payment methods, booking services, guiding services and others.

A great representation of the smart mobility solution is the „SmartCard". Such card work as a payment card for public transportation and nowadays it has been utilized globally. As one of the example, the Oyster card was introduced in London in 2003. As a result of the card incorporation, the bus usage increased by 53%, while metro by 20% and railway by 100%. The card became so massively used, that nowadays it has many additional features. As an example, is possible to pay not only for the public but for the shared transportation (Kamargianni & et al. 2016: 3296). The benefits of such smart solutions are evident, and yet, they are still evolving.

2.2   Sharing economy

Such travel cards usually performed by public stakeholders. Although the Oyster brand is completely owned by the Transport of London (TfL), the Oyster card was created under the „private-public partnership" as a Private Finance Initiative (PFI). It means that several privately owned companies were acting as subcontractors in a public project (TfL 2010).

Nowadays, many governmentally owned mobility projects are looking forward to sharing ownership with private businesses and individual stakeholders. Such trend was named as a sharing economy. An alternative term is a „gift economy," where the privately owned resources are being shared with somebody else to make it work for its full capacity, making a win-win situation for each stakeholder (Sundararajan 2016: 36). It refers to a business model as well, which „creates an open marketplace platform for the temporary use of goods and services often provided by private individuals " (Juul 2017: 2).

Privately owned car owners may share their ride or car through the platform with somebody who seeks it. This solution has been called the ride-sharing, ride-sourcing, and car-pooling. Such solutions eliminate the need in owning the personal car, which solves the urban traffic problem, and they have been called the "Shared Mobility" solutions. Violeta Bulc, Commissioner for Transport said: "Shared mobility is a smart and innovative emerging model of transportation, with the potential to reduce the number of vehicles on the roads: for example, for each shared car, 15 private cars are off the road. We need to ensure that the future of urban mobility is both shared and sustainable" (European Commission 2017).

Shared mobility is financially supported by governmental and nongovernmental organizations, especially in European regions (European Commission 2017). „In the European Union (EU), the total revenue from the sharing economy increased from around 1 billion euros in 2013 to 3.6 billion euros in 2015" (Winkler 2017).

The key factor in sharing economy is trust, which is critical for peer-to-peer activities. To increase the user trust, software platforms integrate the rating systems, like Airbnb and Uber did. Some services incorporate the ID verifications systems. Only a few systems take a record on a criminal activity. The reliability is shared across platform users, which is a valuable verification of the service safety (Wosskow 2014:18).

2.3   Critics on smart mobility

Smart Mobility implies many services and technologies. Consequently, there are several matters that may either reinforce or challenge solutions execution. The most recent global obstacles have met companies which have utilized the sharing economy ap-proach. The challenges that shared mobility may cause are combined as followed:

- Legislations

The avoidance of being a licensed user of a certain sharing economy service leads to the misunderstandings in legal systems. As an example, taxi drivers in Paris are obliged to pay around 100 000€ for a taxi license, whether Uber drivers not (Arthur 2015). The sharing economy and current regulations are not synchronized in many countries and governments, creating an unfair marketplace for upcoming services.

- Taxes

Any licensed company shall pay the taxes. The housing and transportation companies are not an exception. Sharing economy users are not official, thus, they are not licensed as businesses or employees. As a result, service providers like Airbnb and Uber are offering similar solutions without paying taxes (Arthur 2015).

- Labour

As well as taxation avoidance, sharing economy users cannot be considered as employees. Their pension benefits, as well as, unemployment benefits are not regulated. Furthermore, there are no regulations on the previous work experience and criminal records check (Wosskow 2014).

- Safety

Sharing economy companies cannot completely assure the public sector on the worker's identities and what are their intentions, which makes sharing economy operating environment endangered (Field 2015).

- Competition

Sharing economy businesses increase their profit turnover dramatically. Such trend makes the long-term competitive businesses suffer losses. As a result, powerful competition may close any market entries for sharing economy businesses (Chrisafis 2016).

Due to the massive protests across Europe, including Finland, governments and European organizations are forced adopting new policies in managing the sharing economy services. For the most part, companies with a smaller customer database are safe to utilize such solutions on a local scale, since local regulations are easier to follow.

But businesses, which prefer to utilize innovative autonomous technologies, are also under risk. There are several obstacles that it is important to consider:

- Investments

According to the Victoria Transport Policy Institute report, the future of the autonomous (self-driving) is positive. However, the implementation of such technologies into urban planning and public infrastructures requires more funding than any other technology (Litman 2018: 3).

- Human interactions

In many services, people are underestimated. It is believed that it would be at most feasible when self-driving technologies would not help to carry the luggage or help safely reach the vehicle (for elderly and people with disabilities) (Litman 2018: 6). The social aspects of self-driving transportation modes are often ignored.

- Regulations

The self-driving technologies sometimes not managed by a human. As a result, there have happened many cases where self-driving vehicles caused fatal accidents. Due to that matters, some non-governmental and governmental organizations still fighting against applying autonomous vehicles into practice (Newcomer 2018).

- Security

The autonomous vehicles are operated through the software systems. So far, any software might fail or be hacked. For similar reasons, only advanced software and sensors would be able to detect pedestrians, cyclists and motorcyclists, which are often being the case of an accident (Litman 2018:10). Other safety issues are related to the electric vehicles, which batteries may explode when having a crush or collision (Eisenstein 2017).

- Environment

Another problem that electric vehicles may cause is electricity consumptions. According to The Guardian article, which may be supported by many other pieces of evidence, in some cases, electric cars are more dangerous for the environment than fossil fuel. It is important to investigate how the country or state produce electricity. Norway, for an example, uses renewable hydroelectric power, which is safe. However, coal power will make the electric vehicles produce even more danger to the environment than the emission of CO_2 (Clarke 2017).

Besides the obstacles that smart mobility solutions may encounter, the idea itself has few disadvantages. New digitalized solutions replace the existent ones, making the mobility practice more confusing. As an example, in many public transportation vehicles, it is no longer possible to purchase the ticket from the driver, leaving unfamiliar with new services people wondering what to do instead. As a result, convenient smart mobility solutions should complement the existent ones, rather than replace them immediately. The article from Guardian stays (Poole 2014), that smart mobility is made for people's

convenience and advantage. Many critics on "smart city" remind that big data and technologies should care and protect people, not otherwise. Moreover, some solutions block the satisfaction of others. Such as the electric cars charging stations, which are often located on the pavements, limit the accessibility for the pedestrians.

Additionally, European Transport policies have been regularly updated in cases of oil dependency, gas emissions, and congestion issues. Currently, EU committee has released a set of standards that European members are obliged to reach in the near future. Particularly, they have been attached to eliminating the oil consumption by incorporating electric alternatives, reducing the CO_2 emissions through the transportation sector and balance out the road/air traffic (European Commission 2014: 18). Changes in policies might further occur. As a result, transportation and smart mobility sector should carefully consider the changes.

Moreover, some critics believe that "smart city", as well as smart mobility, is a utopia which would bring many controversies between society and technologies. According to the research from U.S. Department of Energy conducted in 2017, without a carefully conducted framework and engagement of many stakeholders, the digitalized services would fail due to their inconsistency (Sperling 2017).

2.4   Mobility and tourism

Nevertheless the obstacles, the changes are inevitable. There are two companies that changed the perspectives on the shared market and boosted the investments into sharing economy solutions – that are Airbnb and Uber (Kollewe and Davies 2016). Uber is the ride-sourcing service platform, where private car owners offer a ride. Whether, Airbnb is the housing service platform, where privately owned homes and rooms are offered for a short stay. Notably, that both services have been successfully utilized by tourists. Not surprisingly, if consider the global supply chain and easy accessibility.

Nowadays Airbnb is operating in nearly 190 countries and 34 000 cities (The Airbnb 2018). In September 2018 the Airbnb released that they have reached the 400 Milion guest arrivals milestone (Airbnb 2018). The number of offered services is expanding, as well as the number of hosts and customers. Furthermore, it is predicted to grow from $2.8 Billion to $8.5 billion in 2020, since Airbnb is already taking over the hotel revenues and highly likely will continue to expand (IPropertyManagement 2018). There are no

statistics on who are the customers and what the intentions of the visit they had. However, it is possible to assume that if the person needs the housing services for a few nights, then it is probably for either business or travel purposes. Consequently, the main customer segment for such a platform is travel and business people.

The success of such service lies in its flexibility, budget, and comfortability. The assumption is that many tourists, who are regularly traveling, are seeking new experiences and cheaper solutions. Hotel rooms become usual and expensive in comparison. Moreover, while renting a room it is possible to meet a host and have a brighter experience from visiting another culture.

Oppositely, Uber services are largely utilized by everyone. Its affordable price and easy access make it more advantageous in comparison to taxi companies. During 2014 the share of the Uber rides in the UK increased by 20%, whether taxi rides decreased by nearly 20% (Dogtiev 2018). Comparing taxi companies and Uber is possible to assume why customers preferred one option oppose to another. Firstly, Uber allows ordering a ride directly from the available driver. During the taxi order, the one should contact the taxi operator first and then wait until some driver will be available. Secondly, Uber offers the „Smart" services, such as map overview, driver ratings and info, mobile payment and the pickup location navigation (Dogtiev 2018). It makes the journey more convenient, fast and pleasant.

Furthermore, money wise it is safer since the payment check is present before the ride begins. Thirdly, the main advantage of the service is its global utilization. By using the same platform with personal contact details and payment options, but in another country, the experience will be the same. It becomes so easy to travel and do not worry about the lack of social or language skills, as well, as payment methods and cash exchange. According to the Global Travel Forecast 2018 (CWT 2017:17), Uber is continuing to grow upwards of 10% in 2018. Such growth is defined not only through the sharing economy platforms, but for the reason of the compounded market annual growth rate of 5.5% from 2017 to 2022. The market growth reasoned by the global market recovery, which boosts travel and tourism industries as well.

Some corporate services like car rentals are also fueling the travel and transportation industries. According to the Zion report, the car rental industry will also meet a success, by growing up to 13,5% from 2017 to 2022 (Zion Market 2017). No wonder this travel

service is so dominant since still cars are considered as the most flexible and convenient vehicle mode. Around 77% of all journeys in a global tourism market are made by car (Rodrique 2018).

The connection between mobility services and tourism was always important and valuable. According to the European expenditure statistics in 2016, nearly 30% of tourism expenses are dedicated to transportation (Eurostat 2018). Tourists utilize all the possible mobility modes to reach their destinations. According to the sources of statistics, tourism is growing, which means that the number of traffic participants will increase (Statista 2018). Mobility is a great part of tourism. Tourism may also be considered as a valuable actor in mobility. As a result, travelers may contribute to the development of smart mobility solutions.

3   Current and future trends

Tourism and transportation are influenced by global changes and political situations. Currently, overpopulation and climate change factors are spreading rapidly. One of the main sustainability problems is greenhouse gases emission. As a result, goals like resources efficiency, environmental protection, and climate change elimination are the most trending influencers for the next few years (UNWTO 2018a: 14). One of the largest contributors of CO_2 is transportation and residential consumption sectors, which additionally includes tourism-related housing and catering services (Ritchie and Roser 2018). According to the UN Emissions Gap Report 2017 (UNEP 2017: 14), there are many ways how to lower the emissions in each contributing sector. The transportation sector is the most promising sector since many sustainability solutions have been already applied.

According to the Global Mobility Report in 2017(Sustainable Mobility for All 2017: 6; 14), by 2030 the annual passenger traffic would be doubled in comparison to 2015. This matter leads to another massive issue of urbanization. There will be by 1.2 billion more cars globally, which is twice more than in 2017 totally. The share of the world's population which lives in cities is expected to reach 60% by 2030, and 66% by 2050. So, the overpopulation, traffic efficiency, sustainability, and emission issues are still actual.

The report has introduced 4 objectives that would be trending for the next decade in the mobility industry:

1. Safety – This area includes physical and mental safety during transportation. The major area is pollution and reducing the emissions, since even a small amount of polluted air may damage the health (Therrien 2018). It covers the safety of vehicles; safe driving; safe roads/ pavements/cycling lanes; safety on public transportation; safe environment and less pollution. Such issues might be solved through alternative fuel modes, vehicle modes, smart infrastructure, autonomous driving.
2. Efficiency – This area covers the construction of efficient infrastructure and transportation network, to utilize related resources at the least costs. This includes developments in technologies, It systems, and software. Improving the services and applying innovative solutions (smart mobility and shared economy included).

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3. Green – This area includes the developments in alternative ways of moving with fewer emissions and waste. It includes the research of alternative fuels or vehicle modes.

4. Universal Access – This area includes physical and informative accessibility of services and objects. This area requires developments in innovative solutions that improve accessibility for any stakeholder, both in private and public mobility services. It also refers to the trending mobile applications and utilization of digitalized devices. Special concern is toward people with disabilities (European Commission 2018).

Currently, EU Commission has set the agenda for 2018 as "Clean, Shared and Intelligent Mobility". At the same year, the commission has launched the competition on sustainable urban mobility planning (SUMP Award), promoting clean and intelligent transportation solutions (European Commission 2017). The mobility itself became a trending industry, consequently, there are many opportunities to evolve.

3.1   Trends in Smart Mobility Solutions

Europe is considered as the most suitable area for mobility solutions applications. There are many services that have been successfully implemented. Briefly, there are trends going towards implementation of innovating systems, solutions, and techniques into mobility, thus trends towards smart mobility itself.

There are technological trends in mobility, primarily in robotized and automated means of transportation. For an example, recent studies introduced the Caltech IseAuto (the direct translation from Estonian - „Self Car") minibus which is a self-driven vehicle. It is environmentally sustainable and operates through many software and engineering tools (Iseauto 2018). Similar busses have been implemented in Japan, focusing on the transportation of elderly population around the Nishikata city (Leary 2017). The key opportunity here is the offering of transportation services outside the urban areas, where many destinations are difficult to reach (Deloitte 2017: 3-4). Currently mentioned vehicles are under the experiment processes. Estimated date of execution is 2020.

Additionally, to the transportation means, the sharing economy approach is still developing and trending. Such trends include services like car-, bike- and ride- share. Car-sharing services have been first implemented almost a decade ago. However, such

service is still evolving and considers new ways of development. Car-sharing services are predicted to expand their share, especially in densely populated cities. Car-sharing services, like CitizLPA in Lyon, offers vehicles in the areas around the train stations (CitizLPA 2018). By making the registration, insurance, and payment services easily accessible, people would most likely to use such option after taking the train, then take care of the private vehicle. Scandinavia countries are looking towards applying electric vehicles in car-sharing services (Deloitte 2017: 4). Electromobility is expected to grow within many transportation services and it is required additional research on the application. Overall, most of the cities are not ready to implement the electromobility and that looks like the opportunity.

The Ride-sharing term was introduced many decades ago, however, until recently it was performed manually and not efficiently. The Finnish company „Kyyti" introduced the first on-demand mobility solution in 2017, the aim of which was to connect available cars and passengers. The ride-sharing approach became so demanded, that nowadays Kyyti has signed several contracts with transportation operators around the world (Kyyti 2018).

The most developing solution, however, is the bike-sharing service. There are a lot of existent bike-sharing stations and opportunities around Europe. Additional developments of the service include Bike friendly buses, that allows cyclists to utilize busses. Such buss was first tested in Antwerp Airport in 2018. It allows cyclists to save around 30 km on the route while escaping the dangerous tunnel driving. The tests were so successful, that the implementation is going to be executed (Rottier 2018).

Another bike-sharing development is performed through the Bike Angels program (Lefkowitz 2018). This software utilizes the analysis of the demand on the city bikes in particular areas, so-called the crowdsourcing system. It informs what stations should be refilled more often, and then system informs customers to return the bikes to the most demanded station to earn more points. Such points later might be converted into the free ride on a bike. This software allows to redistribute bikes evenly and make each station always filled

Moreover, services like cargo-bike are also trending and developing (McCartney 2016). This type of bikes contains a widened space in the front or on the bottom of the bike for goods and luggage. Backpacking tourist may conveniently move around the city. Whereas, local commuters and small businesses may flexibly exchange or move goods.

There are new shared services evolving as well. As an example, the recent trend is a scooter-sharing. Worth to mention that scooters are not motorized vehicles. Scooters are small, light, convenient and effective. It is easier to utilize them and combine with other transportation modes. The Bird company and many others are offering electric scooters in urban areas as a sharing service, however, it still just developing (Hawkins 2018).

Notably, that majority of the shared mobility services are demand driven. The customer demand sometimes dictates what would be trending for the next few years. The on-demand solutions are still developing and successfully utilized in services like Uber and Lyf (Taylor 2018: 704-705). According to the Re-think research project conducted in the United States in 2017, transportation as a service, or TaaS, will provide almost 95% of miles traveled in the next 10 years. The research estimated that by 2030 almost 40% will be privately owned vehicles, which will represent only 5% of miles traveled (Arbib and Seba 2017: 7).

The nowadays trends in smart mobility also include software and IT (Information Technologies) developments. Such features allow to incorporate new service and offer new solutions without changing the environment and construction. The IT services related to mobility were called MaaS, or Mobility as a Service. According to the Transport Research on urban mobility (Kamargianni & et al. 2016: 3295), MaaS is an integration of the software into transportation services. It includes ticketing, informing, connecting, booking systems to increase the transportation efficiency through software.

There are issues like limited parking space in urban areas. However, there is a mobile application that informs users of the available free spots around the city, which generously saves time. Parking lot construction in the capital area is the expensive and long-term, sometimes even impossible. Solutions like this, make parking possible and effective.

A solution like „OnlyMoov" presents a wide range of traffic information, including a real-time illustration of the roads (OnlyMoov 2018). This feature shows which routes are closed, or under construction, or in a jam. Additionally, the service informs on all the means of transportation available in the city and connects together all the services.

Such services may also include ticketing and booking services. Additionally, there are services that cover global demand. As an example, there is a bike-sharing map, that

allocates every available source of a bike-share worldwide (Bike Share Map 2018). There are many yet unknown opportunities in software development, as a result, they are still ongoing and trending. Considering the fact that for the most part infrastructure should be adjusted to the new means of transportation, IT solutions are the most beneficial and cheap. Nowadays technologies grow so rapidly, that new opportunities are evolving regularly.

To conclude, there are several trends in the field of mobility: autonomous and robotized vehicles; electric means of transportation; shared services (ride-, car-, scooter-, bike-); on-demand services; MaaS / TaaS; IT-based solutions and services. As a result, all presented trends are focusing on making the mobility efficient, sustainable, safe and accessible – smart.

3.2   Trends in the travel industry

The International Monetary Fund revealed that in 2018 there would be expected the global economic growth by 3.6%. This will positively contribute to the travel industry (CWT 2017: 2). As a result, tourism is trending on its own. Additionally, due to the rapid information flow, improvement of the border passing and globalization movements, the tourist's volume is also growing. For the last decade, the tourism growth was primarily shifting to Asia, Africa, and Middle-East countries. Referring to the article from the Telegraph 2018, almost every travel-friendly country welcomed more tourists than a year before (Smith 2018).

According to the Michelle Baran article posted in a travel magazine in 2017 (Baran 2017), there is a growing demand on European destinations in 2018, increased by 8% within a year. Europe is the most demanded travel region worldwide, reaching 51% of all tourists arrivals (UNWTO 2018c:12). Interestingly, that the capacity of international, especially the US, tourists is so high, that the „over-tourism" starts to develop in the European region. This means that most popular European destinations are not able to provide all demanded services. This shift helped countries like Belarussia, Moldova, Poland, and Greenland to offer travel alternatives and enter the tourism market (Baran 2017).

According to the UNWTO World Tourism Barometer release in March 2018 (World Tourism Barometer 2018: 3), international tourism expenditure has grown as well.

Notably, Countries like the Russian Federation, Spain, Brazil, and Sweden have spent more than 10% on tourism more in comparison to 2016. Still, the three most spending countries remain the same: China, with the annual growth of 4.7%, USA – 9,4% and Germany – 2.8% in comparison to the 2016 year. The expenditure of the Chinese tourist only in European region has increased by 6% in 2017, while expenditure from USA tourists by 9% (UNWTO 2018b: 3).

As a result, tourism is continuously growing, expanding the travel destinations barriers. It means that Nothern Europe, which until recently was not well demanded, will have a great possibility to welcome more tourists. The shift in travelers is not significant in comparison to the previous years, consequently, Chinese, American and German tourists will have the biggest share in travel expenditure in the near future.

The UNWTO (World Tourism Organisation), the UNDP (United Nations Development Programme) and UN (United Nation) System have released trends that are actual until 2030. Trends concentrating on achieving sustainable growth in the sector, since tourism has a great effect on job and wealth creation, economic growth, environmental protection, and poverty alleviation (UNWTO 2017). Moreover, UNWTO has organized the 1st Tourism Startup Competition in October 2018, initiative of which is offering the opportunity for sustainable solutions to be executed with the global support. As a result, there is a need for the development of a sustainable mobility option (United Nations 2016).

Besides the regulative policies that were established from the global perspectives, worldwide customer wishes have also experienced few shifts. As an example, recent ATTA (the Adventure Travel Trade Association) study released that active travelers expectations changed from risky activities to more cultural (Viren and Murray 2017: 19). The shift was defined by the tourists wish to learn and expand the world through food, culture and human experience. Experiencing physical danger or taking risky adventures becoming less interesting for active leisure tourists.

The desire to experience something new has lead to interesting discoveries. The Forbes travel study released that almost 50% of American travelers would consider traveling to cooler destinations during the winter (Lane 2017). Such a trend might be supported by the growing tourism in Iceland, with 32,9% of total tourist arriving during the winter season in 2017 (Iceland Tourist Board 2018).

There is also an evident shift in the traveler's segments. More often tourists prefer to travel alone and independently. Such travel mode becomes more popular, and was called the „Solo Travel". According to the Visa Global Travel Intentions Travel study from 2015, the percentage of independent travelers grew from 15% up to 24% from 2013 (Brown 2015: 19). Such shift is continuing to evolve, opening new opportunities for the travel industry. Some sources predict that every fourth American traveler will travel solo during 2018. Jillian Dickens, the director of Bannikin Travel & Tourism says: *"The solo travel trend has been on the rise for several years. But what's interesting now is the noticeable shift in the mindset of these solo travelers"* (ATTA 2018: 19).

According to Visa Global Travel Intentions Travel research, solo arrangements noticeably contained the increase in personal guided tours. From 2013 to 2015 such arrangements increased by 14%. Interestingly that the same study showed that the share of the toured arrangements also increased. In comparison to 2013, solo tourists preferred toured bookings by 16% more in 2015 (Brown 2015: 16). As a result, solo tourism expanding the range of offerings that would be successful and trending in the near future. Such offerings include guided tours for individuals, solo travel services and solutions, additional booking platforms for the segment, new marketing entries. The „Solo Travel" led to the evolvement of Single-parent travel, which becomes more trending nowadays (Vartan 2018).

Nonetheless, according to Visa Global Travel Intentions Travel research, almost 60% of overseas travels were arranged independently (Brown 2015: 16). According to the American Bureau of Labor Statistics (BLS) job report, almost 12% of Travel Agencies employment will decline by 2026 (BLS 2017). Due to the availability of information and the possibility to arrange the trips independently, travel agencies still benefitting when offering specified or particular types of trips.

In assistance with shared services and IT solutions, arranging the trips became easy and safe. Such services like Airbnb, Uber, Lyft, Booking.com, Tripadvisor.com etc, offer necessary information and value to the potential consumers (Juul 2017: 4-5). Independently arranged trips are cheaper and more flexible, consequently, young and enthusiastic travelers prefer such options more.

4   Finnish capital area as an operational environment

To be able to predict the future of smart mobility solutions in Finland, it is necessary to investigate the current situation in Finnish mobility and travel industries. Investigate the applicability, funding, and compliance with local authorities. It is also valuable to present recent innovations and developments in the sector in Finland. Furthermore, it is important to establish what areas are the most suitable for conducting the traveler's research.

Finland is one of the northern countries in Europe. It is surrounded by Norway, Sweden, Russia, and Estonia. Currently, the Finnish market is steadily recovering and annual Gross Domestic Product (GDP) growth is expected to reach 2,4% in 2019 (OECD 2018). According to the Europe 2020 Competitiveness report 2014, Finland is ranked as the most innovative and competitive country in the world (World Economic Forum 2014: 8-9). As a result, due to the employment and earnings rising, private consumption will possibly increase in 2018.

Finnish population is steadily growing at a slow pace, increased by 0,35% in 2018. Nowadays, 83,8 %, thus 4 663 941 people live in urban areas (Worldometers 2018). Referring to the metropolitan area occupation of 52,2% of the total Finnish population, it is important for Finland to improve the living standards within the larger urban areas. Such issues like overpopulation, high emissions rate or inefficient traffic are not present in Finland. Nonetheless, it is important to predict such issues in advance and apply necessary solutions as fast as possible.

The Finnish transportation sector is evaluated for 30 billion euros annually, leaving the private mobility with 15 billion €. According to the Statistics of the Finnish Transport Agency release in 2017, the vast majority of the passengers use the passenger car option, which is about 85%. The same study also states that in 2015 the majority of public transportation, 94,5%, was used in the regional metropolitan area. This area (Uusimaa) includes cities like Helsinki, Vantaa, Espoo, Kauniainen, Vihti, Kirkkonummi, Sipoo and other (Finnish Transport Agency 2017:13). Helsinki region (regional metropolitan) contains 26.7% of the total Finnish population (Helsinki Region 2018). Interestingly that the private sector car owning percentage has fallen by 5,7% in 2018, showing a positive tendency in mobility usage (OECD 2018). In Finland, almost 17% of household

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expenses are gone to transportation and mobility (Tekes 2017:4). Which means, that nearly 20% of the income is dedicated to either transportation ticket expenses or car-owning expenses. In either way, the savings might be significant if eliminate the expenses make public transportation less expensive and reinforce its usage instead of having the own car.

4.1 Smart mobility services in Finland

Finland has been improving its living standards by developing the urban city infrastructure for many years. As an example, for the next 10 years Tampere city municipalities, alongside with the European and local organizational support, created a long-term plan of applying innovations, robotics, 5G mobile network, smart mobility platforms into the city ecosystems. Besides the long list of partners and stakeholders, such plan had an investment of 10 billion €. Currently, the City of Tampere has planned to incorporate the tramline by 2021 (City of Tampere 2017).

Metropolitan area, including cities like Helsinki, Vantaa, and Espoo are currently focusing on implementing more smart mobility solutions. According to the Helsinki Business Hub (HBH), Helsinki is the global leader in offering smart mobility solutions and services (Helsinki Business Hub 2018). Helsinki has many transportation modes already: buses, trams, trains, metro, and bicycles.

City bikes were first introduced in Helsinki in 2016. Within two years there have been built 150 stations and almost 34 000 riders have a seasonal pass. (City of Helsinki 2017). Espoo has also introduced the first 70 stations, and altogether there are around 2 550 bikes for use (HSL 2018). Interestingly, that Helsinki is very cycling friendly, there are 1 200 kilometers of cycling paths, from which 730 are paved (City of Helsinki 2018). As a result, cycling in Helsinki is safe and comfortable, even for tourists.

Indeed, Finland is piloting in smart mobility applications. At the end of 2016, a first MaaS (Mobility as a Service) service was introduced in Helsinki Region – Whim (Whim 2018). This mobile application combines public transportation, taxi, car-sharing, and bike sharing services. The service is free of charge when the rides are rare, thus, payment is conducted per each ride. However, the Whim allows regular urban commuters to purchase the seasonal access, which makes car-sharing and taxies more affordable.

Notably, that MaaS term was also first introduced in Finland, by the Whim developers. The core idea of the service lies in „bringing all the means of travel together". The MaaS services are also based on demand and customer preferences, which make this concept perfect for the sharing economy solutions (Maas Global 2018).

The Kyyti is the first on-demand MaaS solution that was also invented in Finland (Kyyti 2018). The service Kyyti was developed in March 2017 with an additional release of Tuup mobile application. The Tuup service was selected as the Best Mobile App in Finland in 2017. Kyyti concept is built around the flexible pooling services. It offers on-demand small sized vehicles (up to 12 meters minibusses) which serve as a taxi or a shared ride transportation modes. Tuup, on the other hand, is an application that offers a variety of options for the customer, from taxies and rides sharing options to public transportation and city bikes.

Car-pooling or car-sharing services became more trending in Finland recently. DriveNow is one of the most utilized carpooling services in Helsinki (DriveNow 2018). This service works as a car rental for a particular amount of minutes or hours. The vehicle fleet is considered as low emissioned and sustainable for urban mobility. DriveNow vehicles are also possible to rent to travel for more distant locations if needed. The DriveNow vehicles often seen on the roads of Helsinki, which means that customers appreciate and need shared services in the capital area. Shared Mobility Study on Helsinki has also reported that 4% of all Helsinki Metropolitan Area cars would fill all the journeys traveled if shared mobility was applied (International Transport Forum 2017).

Another service that is based on the car-sharing, but on the peer-to-peer basis, is Blox Car (BloxCar 2018). It allows customers, application users, to offer and rent cars from each other. According to the research results presented at BloxCar, 20% of 2.5 Million Finnish car owners are ready to become a member of a sharing service.

All the mobile services applied in Finland utilize the advanced ITC (Information and Communications Technology) technologies and mobile access. The 94,4% of Finnish households have internet access in 2017 (OECD 2018). In addition, according to the Global Information Technology Report 2015, Finland is ranked first in ICT skills and in NRI (Network Readiness Index) (World Economic Forum 2015: 8). This means that further applications of more advanced ICT technologies are possible to occur. Moreover, it

means that the majority of the mobile applications would be reliably executed due to the great internet connection and technical support.

The Europe 2020 Competitiveness Report has also revealed the most developed countries in Smart and Sustainable growth. Finland was ranked as first and second respectively (World Economic Forum 2014:12-14). This is supported by the implementation of automated and robot vehicles into the urban infrastructure. During the European Competition CityMobil2, City of Vantaa has introduced the autonomous minibusses test drive. The minibus was implemented between the Kivistö Railway Station to the Housing Fair exhibition in 2015. The journey was one kilometer long with a speed of 13km/h for the safety reasons (Lumiaho 2016:28). Nowadays, the autonomous minibus called RobobusLine is running in the east of Helsinki in Kivikko. Currently, the Robobus Line is a part of an experiment which will be completed within 3 years. However, it is already completely integrated into the road traffic and operates as a metropolitan area public transportation mode. It is also connected with the Finnish journey planner application (Reittiopas) where passengers are able to check the schedule and route of the Robobus.

Another big topic of Finnish urban living is parking. Currently, there are many applications and developments that improve the way this service is operated. As an example, there are services like Parkman, which indicate the real-time free parking lots nearby. It is also possible to make the parking purchasing through the mobile application. Similar service is performed by Witrafi, which also informs users about the available parking spots. Witrafi also offers the Rent-a-Park service, where regular parking lot commuters may "temporarily purchase" the parking spot (RentaPark 2018). This option is most suitable for people whose work/school parking space is unregulated.

Another mobile application, The EasyPark, is often utilized in the metropolitan area, making the parking purchases flexible and easily accessible (EasyPark 2018). There is also developing a new Lean Park system, which combines robotization and smart mobility services (LeanPark 2018). This innovation would make parking safe while saving the time and space. The concept includes the multileveled construction, which would be maintained and operated through information technologies. The Lean Park system user just have to leave a car to the platform and check in to the system. The parking would be automatically made.

Moreover, solutions like Parking Energy discovered a method of easy and relatively cheap implementation of electric car chargers (Parking Energy 2018). Due to the quick installation method, and flexible implementation to any location, this solution will reinforce the electric vehicles usage. Currently, there are 1039 electric cars in Finland, local news revealed in 2017 (Yle 2017). The reason for that is high prices and a small amount of charging stations. The prices are formed on the market and VAT level basis. Electric cars have a lower emission rate, which lowers the annual taxation rate. But it is not enough if compare the electric car market price to the ordinary petrol car alternative. All in all, there are only 800 charging stations across Finland, whether Norway has 9000. As a result, electric car charging stations is a growing trend and further solutions should be discovered.

Without any doubts, Finland organizations are eagerly finding new ways to improve urban and rural infrastructure. However, Finland is one of the northern countries. The winter is the longest season, which may last for about 100 days in a year. Season factor influences customers perceptions and limits the applicability of some solutions. Such an issue is currently under the investigation. As an example, the robot vehicle called aIGO is being tested from September to December 2018 in the Helsinki Region (Sensible4 2018). This automated vehicle would give further information on how self-driving vehicles operate during the extreme weather, including rains and cold.

During the winter months, city bikes are usually kept away from the use due to the safety matters, which limits the accessibility. The city of Turku decided to intervene and incorporate the winter tires for each City Bike. The bicycles use is so popular, that during the winter a large number of solutions are not operating on the full capacity. Tires change will balance out the demand for flexible mobility all year long (Piiranen 2018).

4.2   Travel in Finland

Notably, that winter season is quite demanded by upcoming tourists. Due to climate change, snow is a trending and precious travel feature (Climateguide 2010). Beauties of Lapland, as well as, winter leisure activities and Christmas spirit attracts more and more tourists. Logically, Finland may become the all year desired destination.

According to the European tourism growth, Northern Europe destinations have grown by 4%, whereas Finland has the increase of 14% in arrivals in 2018 (UNWTO 2018b:10).

The Visit Finland Visitor Survey research has revealed that in 2017 Finland has welcomed 8.3 Milion foreign visitors. According to the research, the most visited Finnish areas are Lapland (24%) and Helsinki area (43%). Around 3.3 Milion visitors were on a day-trip visit. (Visit Finland 2018.)

The one or few days trips travel becomes more trending in Finland (Hannele 2017). Interestingly, that in 2015 Visit Finland and Finnish airline Finnair has introduced the travel solution – StopOver. The Stopover is the travel package which may last from 5 hours to 5 days exploring the most popular destinations in Finland. The Stopover was essentially developed in Iceland, which made the Icelandair airline booming. The Finnish Stopover service is focusing on the customer segment from Asia (China, Japan, South Korea) (Visit Finland 2015). The same study revealed that Russian and Chinese tourists altogether have the share of 43% of all tourists consumption. However, Chinese tourists spend the most per visit.

Finland travel goals are aiming to expand the share of the Asian customer segment. The Air Transport strategy for 2030 includes a promotion of the Helsinki-Vantaa airport as a leading international transit hub for Asian routes, reaching the goal of 23 Million passengers by 2030. Another goal includes improvement of tourism mobile services and an increase in the awareness of Finnish archipelago and natural sights (OECD Report 2016:166). As a result, Finnair made a decision to run a Stopover package, which offers packages within Helsinki region, in Lapland, and in natural destinations.

Finland is the third best country for travel in 2017, due to the significant amount of hiking areas, as well, as having around 40 national parks (This is Finland 2017). Many Finnish travel organizations and agencies reinforce tourists to take part in activity-based travel in nature since this is one of the greatest Finnish advantages to offer. As an example, the accessibility to the Nuuksio National Park is limited, since few gateways to the park are located in the private sector. Such stops as Haukkalampi bus stop is in 2km away from the park gateway (National Park 2018). To a response the NatureVan minibus was offered, which may offer alternative transportation in support to public transportation and personal car (Feel Nature 2018).

Besides, Stopover packages and natural heritages, Finland is taking care of international commuters. The HSL is the mobile application, which is a public journey planner and ticketing service for public transportation. Only in Summer 2018, the application has been

changed to the more traveler friendly. Until recently the application main language was Finnish, which complicated the service usage by international travelers. Nowadays, the application is set in English by default. The HSL plans to improve the accessibility of the service and make it as mobile and effective as possible for any user (HSL 2018).

The tourism in Finland is well established. Tourism is focusing on increasing the Asian customer segment, improve the awareness of the natural sights and make the travel service digitalized and mobile. As a result, smart mobility solutions that would be aiming at such goals would potentially seek success within the traveler sector.

4.3   Mobility legislations in Finland

Transportation, especially public, is regulated by the Finnish Governmental authority - The Ministry of Transport and Communications. The ministry funds, cooperate, guides and regulates the transportation and mobility in Finland. Furthermore, it cooperates with the European Union to achieve common goals and standards. It is closely tied up with the Ministry of the Environment, Finnish Transport Agency, Finnish Transport Safety Agency (Trafi), the Finnish Cyclists Federation, the Finnish Road Safety Council, the Finrail, the Air Navigation Services Finland, Helsinki City Transport (HKL) and et cetera. According to ministry acts, some services are legal in Finland, and some not.

In September 2018, the Act on Transport Services was forwarded to Parliament (LVM 2018a). The three-stage process will set up legislation on a new type of services, primarily shared, to regulate the business framework. The Ministry accepts the fact that shared mobility is developing, and it makes the cities more environmentally healthy. Sustainability and climate change issues are very important topics (LVM 2018b). Furthermore, it opens new opportunities for businesses and makes everyday life more convenient. As a result, digitalized services for transportation and mobility in the near future would be supported by the additional regulations. Such regulations would primarily carry the access of the digital data and promoting a high-speed communication infrastructure (LVM 2018c).

The digitalization friendly approach approves such services like Uber. Worth to mention, that in Summer 2017 Uber platform was closed in Finland. Uber drivers (service suppliers) were not obliged to obtain a license, which was unfair in relation to the taxi operators

(Browne 2018). However, nowadays it is impossible to ignore the need in alternative transportation modes through the digitalized infrastructure. The service allowance Act became eligible in July 2018 (Uber Blog 2018).

The self-driving technology developments are also legally safe in Finland. In 2015 The Ministry of Transport and Communications set a plan for promoting an intelligent automation within all the transportation sectors: road, rail, air, and sea (LVM 2015). Accordingly, robotics and automation are easier to implement, due to the authority support and soft legislations.

The Ministry also promotes walking and cycling (LVM 2018d). However, it is forbidden to take a bike to buses and trams. Metro and train allow such option when there is enough space. So that during the rush hours it is forbidden (HSL 2018a). Another challenge is the winter. City Bikes still will be available during the winter period. However, it is strongly recommended to avoid driving on pavements due to safety matters (HSL 2018b).

4.4 Jätkäsaari West Harbor

The Jätkäsaari area is located on the sea of the South West Helsinki. Until 2008, the area hosted the cargo port primarily, but nowadays, it is turning into a commercial and residential area with the busiest passenger port – „West Harbour". The plan of making the Jätkäsaari the residential area is scheduled for the next 12 years, by 2030. It is aiming to offer housing facilities for 18 000 residents and 6000 office workers. The area is nearly 100 hectares in size, which is utilizing the newest developments in urban construction and smart city concepts (Tiilikainen 2018).

The biggest emphasis lays on transportation. Busy traffic and limited space force to develop sustainable and safe transportation options. Primarily Jätkäsaari plans to focus on cycling and pedestrian pavements around the area. Luckily there is a tram line going from the city center to the West Terminal, which significantly balances the traffic volumes. The traffic volumes are massive, around 4 Milion passengers going through the Jätkäsaari terminals annually (Helsinki City Planning Department 2009:8).

The West Terminal became so busy due to the destinations to and from Tallinn in Terminal 2 and St.Petersburg at Terminal 1. In 2017 the West Terminal 2 (so-called Länsisatama 2) was open after the great reconstruction of the new terminal. The newest

terminal was built according to the fast scheduled traffic between Helsinki and Tallinn. Nowadays, the travel experience between the cities is convenient, mobile, smart, efficient and smooth. To an addition, the terminal construction included new ship quays and automooring systems, which improves the sustainability and convenience of the sea travel. The reconstruction was influenced and funded by the EU, Port of Helsinki, Connecting Europe Facility (CEF) and Trans European Transport Network (TEN-T).

Same stakeholders have also promoted the establishment of the Twin Port cooperation between Port of Helsinki and Port of Tallinn. The sea traffic between such cities is one of the busiest in the world. Furthermore, sea travel and shipping is a great contributor to the economy of both cities, creating jobs and services. Additionally, connection to the Tallinn opens the network corridor to Central Europe, making road and rail transportation options available.

As a result, Jätkäsaari harbor is a significant contributor to Finnish economics. Moreover, Jätkäsaari is planning to improve urban living and offer new accommodations for thousands of residents. Essentially it causes the logical conclusion, that due to the limited space, the movement of people, vehicles, and cargo should be somehow maintained. However, there is no information on how the international customers move around Jätkäsaari. More of that, it is interesting to establish what destinations are important to improve due to the high demand.

Jätkäsaari is located in 3,6 km from the Central Railway Station (Rautatientori) and in 2,6 km from the Kamppi Shopping center. Both Rautatientori and Kamppi are well connected with many cities and destinations outside the Helsinki Region, through trains and buses respectively. However, the only possible way to reach the West Harbour directly is by trams going through the city center. There are two trams that arrive at the Terminals 1 and 2. Both tram stations are available at Kamppi and Rautatientori. Logically, during the rush hours and passenger arrivals, the journey from Jätkäsaari to the city center is challenging and busy.

4.5   Helsinki-Vantaa Airport

Helsinki-Vantaa airport located in Vantaa city, Uusimaa, nearby the Aviapolis area. This airport is the main international airport in Helsinki. The main airport owner and the operator is a public company Finavia (Finavia 2018). The goal of Finavia is to offer high

quality, safe and mobile services for passengers and air operators. Finavia also invests into tourism in Finland and supports many organizations and businesses.

Airport was opened in 1952 to support the passenger volume of Malmi airport. Since 1969, Helsinki-Vantaa Airport has opened the first gates and started to operate as an independent facility. Since then, there have been introduced many terminals, both domestic and international. New expansions and the introduction of the newest facilities have also taken place. Nowadays, airport carries around 20 Million passengers annually, providing nearly 20 000 jobs.

The passenger number is steadily increasing. In 2017 the passenger flow increased by total 9,9%, whereas international passengers' volume by 11,4%. Interestingly, that the main share of the international passengers, which is 71.4%, came from European countries. However, most growth in travelers flow has been from countries like Japan, China, Russia, and Hong Kong. The Asian passenger's traffic has totally increased by 17,6% in 2017 (Finavia 2018). As a result, the airport has won and been nominated to the numerous awards. It is worth to mention that Helsinki-Vantaa airport is considered as the best airport among Nordic countries. Additionally, it is one of the most important transfer hubs in Europe.

Transportation in Helsinki-Vantaa airport is primarily connected with the Helsinki city center. The fastest journey will take nearly 30 minutes by train. The same amount would be spent on a road vehicle. The train station is incorporated into the airport, so it is very easy and convenient to take the journey. There are also buses and shuttle buses available. Primarily they are going to the Vantaa area or to the Helsinki area. All the bus stations are located outside the airport, nearby the taxi stations. There are two bus stop Terminals, which separate the busses destinations.

The ticket vending machines are available inside and outside the airport area. Furthermore, tickets and information could be found at the local kiosks and at the tourist's information point. The HSL application is also a useful tool, considering the available internet connection at the airport.

5   Analysis of travelers´ decision-making process

Understanding the travel consumer behavior helps to define the relationship between different factors which affect the decision-making process. The intentions lie in the ability to manipulate or control the behavior patterns for a certain purpose. There are many existent consumer behavior models, however, tourism model is much more specific and different. Particularly, tourism should be perceived as a service, rather than a product. In addition, travel financial expenditure is large, putting the decision-making process at a high-risk. Resulting in a deep customer involvement with the purchase decision (Horner 2007: 72).

Applying the common tourist behavior patterns to the smart mobility services would highly likely have no outcome. Majority of the existent schemes and theories imply the essentials of the travel planning abroad (hotel choices, aircraft choices et cetera), rather than the transportation options while traveling. However, by analyzing previous findings and schemes it is possible to establish what are the factors that would influence the decision-making process in regard to transportation options while traveling abroad.

The goal of smart mobility solutions for tourists is creating a convenient, accessible and pleasant journey to the desired destination. The desired destination is assigned by the experience that tourists would like to get. Tourists plan their everyday life experience abroad in advance, taking into account market trends and social status of the journey (Crose and Perri 2010: 157). As a result, travelers decision are being made once in advance. Local consumers, on the other hand, prefer services that would be utilized regularly, therefore, the services should focus on loyalty programmes.

As a result, smart mobility services should prioritize the importance of the tourist's experience, which means, that such services should be the first option that tourists will pick to get to a certain experience location. To achieve the first choice service status, the one should consider the tourist's decision-making process.

Referring to the marketing approaches presented by the Metropolia UAS Marketing lecturer William Simcoe (2015: 1-3), some conclusions on travelers decision making might be done:

- Buying behavior consists of Wants (needs), Goals (motivations) and Beliefs (experience);
- It is important to consider „Latent wants" or subconscious wants, that reinforce the positive buying behavior. Positive buying behavior primarily stands on customers beliefs: thus, extrinsic (objective) preferences, habits, picking behaviors and instincts (subjective) preferences;
- The customer has the power in the transportation sector, which means that their expectations and demand should be met, matched or exceeded.

Still, needs are something that forces tourists to begin their decision-making process. The Maslow's Hierarchy of needs presented by Simcoe (2015:5) may help to generalize the traveler's patterns:

Level 5: Self-Actualization and Achievement needs.
Level 4: Esteem needs.
Level 3: Belonging and Social needs.
Level 2: Safety and Security needs.
Level 1: Physiological (existence) needs.

There are six features that influence the decision-making process particularly in service-based offerings: Purchasing Power, Group Influence, Personal Preferences, Economic Situation, Marketing Campaigns, and Information / ICT Accessibility (Iresearch Services 2018). The thesis author has adjusted the factors since Information availability and mobility are essential in smart mobility services.

Travelers needs and beliefs shape the buying behavior. The Maslow's Levels 1 and 2 represent the basic needs, that must be fulfilled by the smart mobility services. Levels 3,4 and 5 will exceed the traveler's needs and improve the satisfaction from the mobility service. The traveler's beliefs are not easy to define or establish, but possible to generalize.

However, the majority of the factors might be influenced or changed by many circumstances (Horner & et al. 2007:154). As a result, it is valuable to predict or estimate what factors are essential among presented above.

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As a result, the analysis of the literature review and travel experience showed, that it is possible to reveal some assumptions like:

- The main motivation of the tourists is to receive the experience;
- Tourists evaluate the expenditure higher when the experience expectations are set high. As a result, there is a dependency on cost and expectations;
- Cost, in turn, is dependent on the convenience and the time wasted on the destination. When either convenience or time are set to a low bar, the budget should be also lowered. Budget = Convenience + Time (Nelson 2013:108).

Figure 1 illustrates the dependencies of the factors. Convenience (quality), costs and time are very rarely could be positively achieved at once. As a result, at least two factors should be positively present, when making the decision.
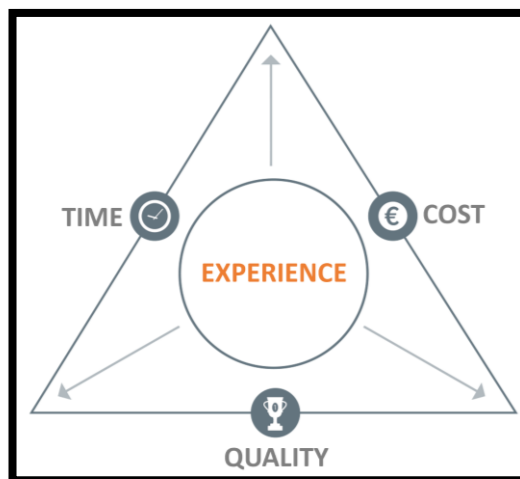
Figure 1. Factors that shape a traveler's decision-making process

As an example, tourists understand that prices for the direct flight to the desired destination would be higher than tickets with layovers. But, it would be more convenient and fast. The expectations are set high. If the time and quality (see Figure 1) are set as positive, the cost, in turn, would be negative, thus expensive. If the purchasing power allows spending such an amount of the budget, this transportation option would be prioritized.

As the outcome, the experience value depends on the quality and time that it's required. During the decision making process tourists evaluate four questions that shape their perception of the service:

1. What experience is expected from the service?
2. How much tourist is willing to spend on it?
3. How long the journey will be for that budget?
4. How convenient the journey will be for that budget?

By answering those questions, tourists will define their prior needs (experience, time, budget, convenience) and chose the most suitable mean of transportation. Taking into account change of many additional features like weather conditions, politics (strikes), health (diseases), social (luxury products), it becomes challenging to apply the universal behavior model. Worth mentioning, that with the expanding personalization services and autonomous technologies, future tastes of consumers will definitely change (Verloes 2015). Which means, that the consumer behavior model will change accordingly (Horner 2007:77).

As a result, it is important to conduct research on tourists behavior locally, considering the potential experience destinations and potential influencing matters. The research should reveal what purposes or a certain type of destinations tourists willing to visit at the location. This will answer to the question what experience tourists are willing to receive. After which, it would be possible to define what factors are the most preferable for particular tourists groups. It is important to discover what subconscious factors if exist, influence the traveler's behavior the most. Moreover, the hierarchy of needs should evaluate the feedback received from travelers, to define some models of beliefs.

As was mentioned before, some hierarchy levels imply the social status and market trends. As a result, it is important to define what are the tourism and transportation global trends. The trend's research includes the latest innovations and services shifts, that change the operational environment. As a result, such change affects the relevant stakeholders, including travelers.

6   Research design

In order to research what Finnish Metropolitan area tourists seek in mobility, nearly 260 international tourists were interviewed. The survey creation and execution was managed by the Last Mile project team members. Interviews were conducted in Jätkäsaari West Harbour 2 in February 2018, where 101 passengers took part in a questionnaire. 165 interviews were collected at the Helsinki-Vantaa Airport during the March - April 2018. Surveys were conducted as a part of the Last Mile project.

6.1   Data collection

The survey questions were based on the theory behind the traveler's behavior. General questions of gender, age, purpose, and duration of the stay, type of travel and nationality define the customer behavior pattern. The patterns might later establish the correlations between some variables, that might be interesting to discover.

The questions considered what destinations tourists have primarily visited, how they have been traveling, what tools and services they have been utilizing and what comments they can share. This information gives a straightforward understanding of what transportation and services are currently the most popular in the Helsinki Region and how satisfied are the tourists by using them. This section gives the most basic information, which could be later utilized for offering the alternatives.

The West Harbour survey was managed by three people, including the thesis author. The first draft questionnaire was tested during on February 12th, 2018. There have been offered the mobile tablets to conduct the survey. Surveys were automatically forwarded to the Google Forms. Presentation posters, table and small equipment (pens, brochures, tablets) were offered by the Metropolia UAS Leiritie campus.

The first draft survey contained nearly 25 questions. Surveys were translated to Estonian, Russian, Finnish and Swedish. First tests showed that the majority of the harbor passengers are either Helsinki Region residents or regular commuters. The results of such gave no value to the thesis purpose. Consequently, such customer segment was excluded from the interview. Moreover, many passengers shared the comments on the

survey. The majority were unhappy to answer that long survey and their interest loosened by the end of it. Interestingly, that the most valuable questions were placed at the end.

As a result, surveys were reconstructed and narrowed down to 17 questions. Additional translations were primarily eliminated, few of which just have been available in any case. Surveys were separated to the "transit" and "general" surveys. Transit survey passengers have not visited any sights and could not fully contribute to the survey. The upgraded survey was asking the travel purpose and transportation choices questions at first, whereas questions on age and nationality were placed at the end. The final survey questions are presented in Appendix 1. From 26th of February to 1st of March the harbor surveys were conducted. The survey took place among departing travelers since in that case passengers have at least traveled for some time in Finland and they had something to contribute.

West Harbour 2 appeared to have the safety constraint. It was only permitted to conduct the surveying nearby the gate 1. The gate 1 is opening in 30 minutes before the ship departure. As a result, many passengers have been passing through gate 1 directly, when coming late. If the needed legal passes would have been collected in advance and the access to gate 2 would be received, the duration of the survey would be twice shortened or the sample size would be doubled.

The timetables were chosen regarding the departure schedule. The busiest time appeared to be from 8 a.m. to 1 p.m., where it would be possible to catch passengers for 3 departures. After 1 p.m. there has been a departure pause, which was dedicated to the answer's analysis and recording. Other two departures have been caught during the next hours until 4 p.m. As a result, nearly 7 hours per day three people were surveying the passengers, asking about 20 people per day.

The preparation for the Airport surveying was challenged. The same safety constraints forbade the pass behind the customs gates. Behind them, the majority of passengers were wasting their time at the shops, restaurants and waiting rooms. However, it was permitted to ask passengers at the Airport entrances.

Airport surveys were conducted with the cooperation of ten Metropolia UAS Innovation Project participants. The survey was primarily based on the Jätkäsaari framework. The

Airport survey included additional questions on the Vantaa sights awareness. It was interesting to discover, do passengers intentionally going to the Helsinki city center or they have no other options. This factor influences the traveler's perception and behavior in the area. Surveys were conducted in the 2-3 hour shifts of 2-3 people. The airport is operating constantly, therefore, the timetables were chosen according to comfortability and availability of the participants. Usually, surveys were conducted from 10 a.m. to 4 p.m. on Thursdays and Fridays from March 13th to April 3rd.

The type of the surveying has also been changed. Instead of having the tablets that directly forwarded information to Google Forms, there have been printed surveys. After each shift, the interviewer was manually putting the answers to the Google Form, from which they were later taken for further research.

During the Jätkäsaari research, it has been noticed, that many Asian tourists do not know English sufficiently enough to communicate. Usually, their trips were guided. Assuming that the airport's biggest share of the passengers would be Asian, surveys have been translated to Japanese and Chinese. Moreover, the native speakers were participating in the surveys as well, which significantly reinforced the survey process. 165 participants have answered the survey at the airport.

6.2   Data analysis

The results were transferred into Excel document, after which they have been analyzed and combined. One of the goals was to analyze the statistically valuable data, thus quantitative, to evaluate the significance of the research. Worth to mention, that all Figures listed in this section are original. However, some Figures have been earlier presented in the Last Mile project reports and presentations. The rights on Figure use and copy are complied.

Altogether there have been collected 266 respondent answers. The average completion percentage is 83%. Meaning that an average 17% of answers were either missing or not valuable. Interestingly, that in Airport the percentage is 83,4, whether in West Harbour is 82,7%, which is quite similar.

According to the surveying observation process, it was noticed that the majority of the tourists were traveling in a small group of 2 to 3 people. There have been several individual travelers, however, their share is not significant enough to support the trend in individual traveling. Assuming that, individual travelers mostly prefer active leisure and hiking, further research on the traveler groups might be conducted during other seasons, such as summer and autumn. There have been several guided groups as well. The share of organized tours was also statistically not significant.

As was assumed, the vast majority of Airport visitors, 76%, were coming from Asia and Oceania countries. Figure 2 presents the share of countries of origin found in the airport survey. Altogether, 59% of all airport survey participants came from Japan and China.
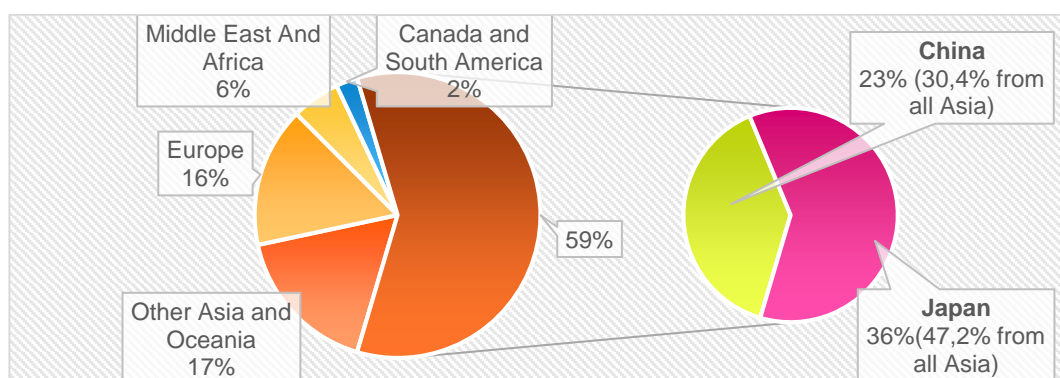
Figure 2. Airport passengers defined by the country of origin.

In the harbor, on the other hand, the vast majority was from European countries, reaching 54,8 % of all passengers. Whereas, 34,7% of the European customers were Estonian citizens. Interestingly, that the share of the Asian tourists was bigger than expected, reaching 35,5% of total harbor respondents. The majority was also traveling from Japan - 45,5% and 30,3% from China.

Figure 3 presents the share of all survey participants defined by their country of origin. Altogether, there have been interviewed 61,5% of Asian and Oceania tourists in harbor and airport. Asia and Oceania tourists were coming from countries like Japan, China, Hong Kong, Singapore, India, Taiwan, Indonesia, Thailand, South Korea, the Philippines, and Malaysia. There are 29% of Japanese and 19% of Chinese tourists among all the passengers.
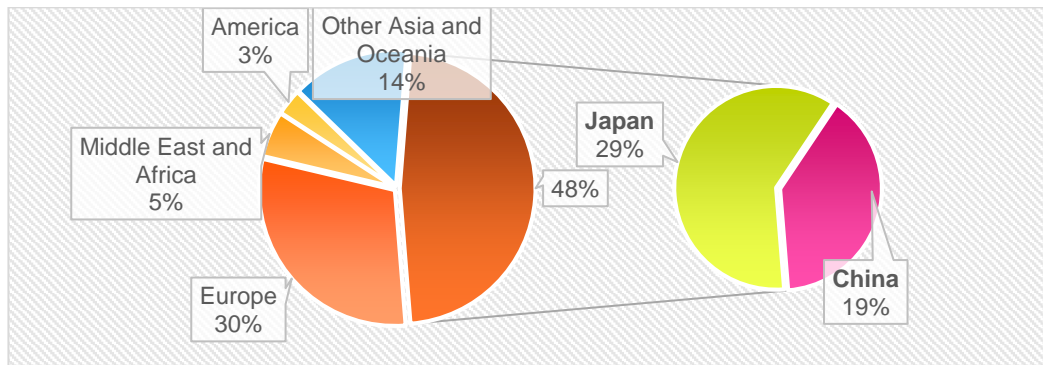
Figure 3.   The share of survey participants defined by the country of origin.

51% of Jätkäsaari and 60% of airport visitors came for the holiday and leisure purposes. The Jätkäsaari harbor, as appeared, is a suitable place for the transfer tourist. 32% of all harbor interviewees were passing through Finland, thus their purpose of the visit was a trespassing.

Interesting findings show, that almost 98% of all harbor passengers have planned and visited Helsinki Region sights, primarily in the Helsinki city center, counting 51% of all visited destinations. Since journey to Jätkäsaari goes through the city center, every Jätkäsaari passenger has traveled through it and visited nearby facilities.
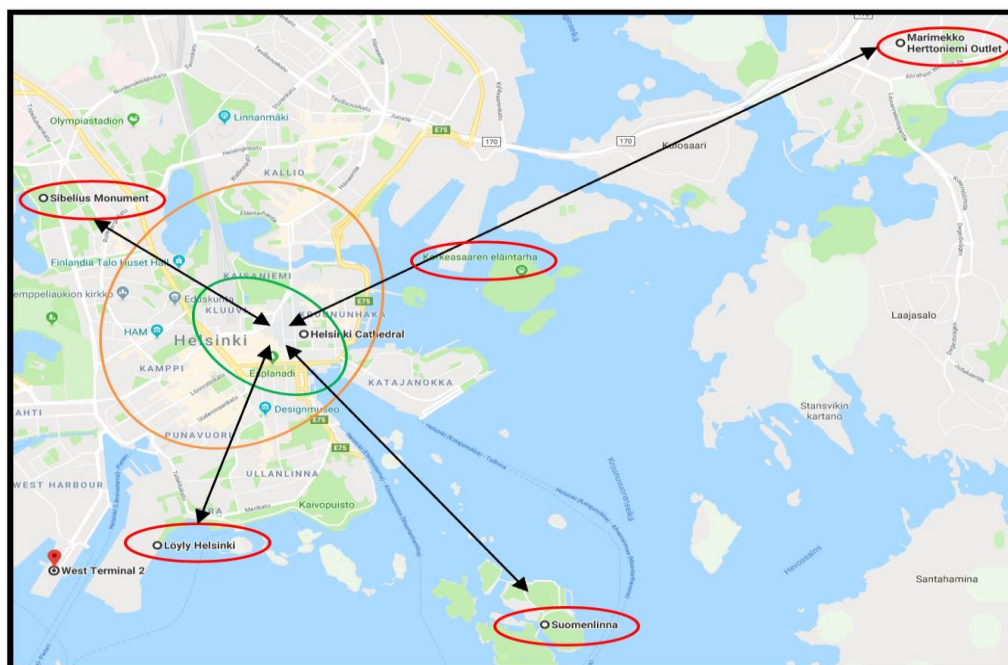
Figure 4. Visited locations defined by their distance from the Helsinki City Center.

City center, enlarged city center, and peripheral city center define all visited locations by their distance from the city center. Figure 4 illustrates the locations defined by color: city center – green; enlarged city center – yellow; peripheral city center – orange.

Figure 5 shows what locations have been visited in the Helsinki city center the most. Almost half of the passengers, thus 46%, have visited the Helsinki Cathedral, which makes it the most visited location in Helsinki city center. Which means that passengers that either passing through Helsinki city center or staying in it will highly likely visit the Helsinki Cathedral.
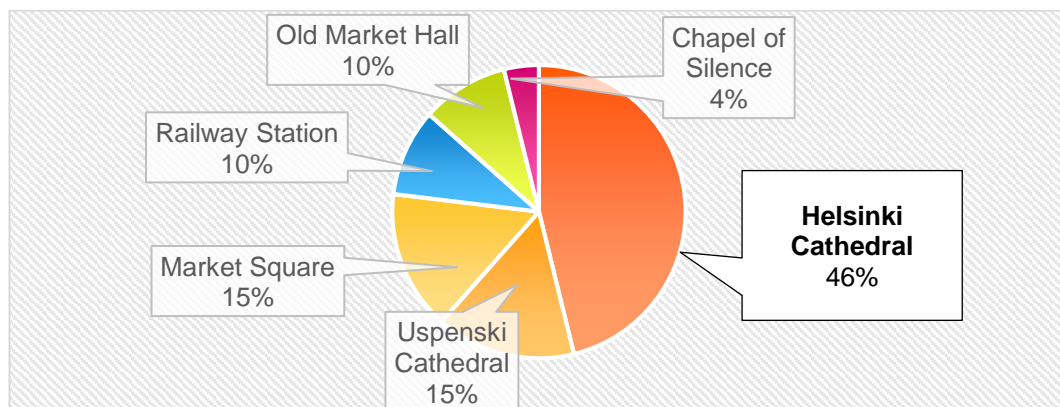
Figure 5. Locations that have been visited the most in Helsinki City Center. Jätkäsaari survey.

Figure 6 shows the definition of visited locations by their type. 41% of all visited destinations dedicated to Architectural Establishments, such as cathedrals and churches. Next most popular types are shopping facilities, parks and restaurants. The detailed information on what locations are included in each location type is present in Appendix 3.
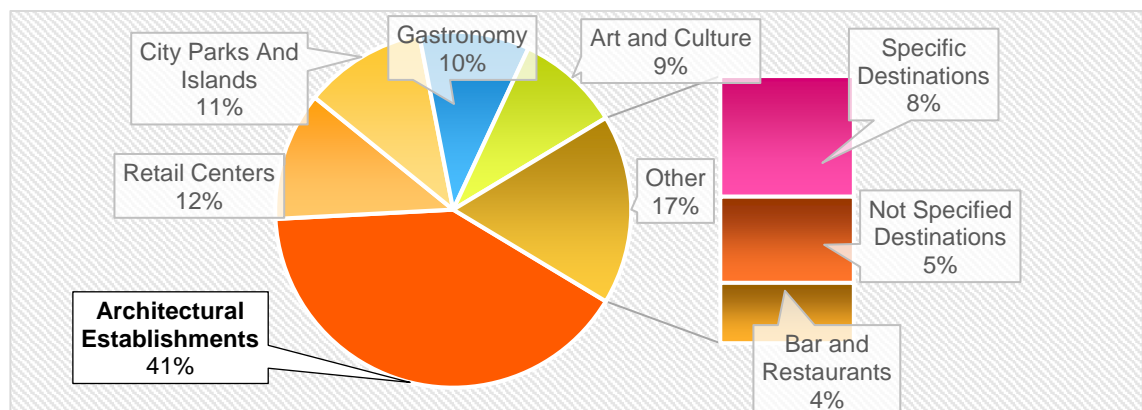

Figure 6. Definition of visited destinations by their type. Jätkäsaari survey.

The 65% of Airport passengers have also visited the Helsinki Region, whether 21% have visited Northern Finland, 13% have visited other cities (Tampere, Turku, and others). The airport survey was not as specified, as Jätkäsaari survey. As a result, many destinations and locations have a general meaning.

Figure 7 shows what locations have been visited the most in Helsinki Region, given by the Airport passengers. 38% have visited cities like Espoo, Vantaa, and Helsinki in general. 38% have visited Helsinki City center. 8% and 7% represent the shopping malls and Suomenlinna visits, respectively. Other 9% represents museums, Railway Station and not specified locations.
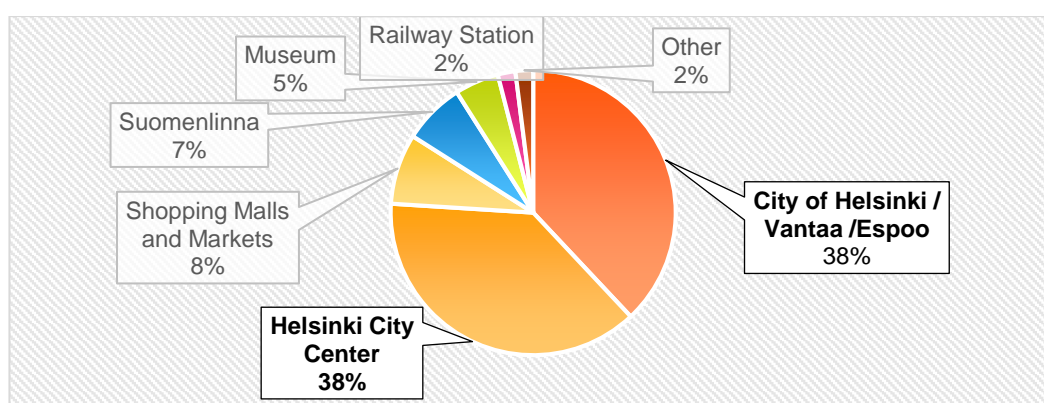

Figure 7. The share of visited locations in the Helsinki region. Airport survey.

As a result, in average 44,5% of all listed destinations, both from Jätkäsaari and Airport surveys, imply the Helsinki city center. Which creates an assumption, that almost half of tourists would like to visit Helsinki city center and Helsinki Cathedral.

There have been also found interesting dependencies. The harbor visitors were primarily aged 18-24, counting at 44% of all passengers. At the airport, the vast majority, 45%, were travelers aged 25-34. For some reasons, harbor passengers were primarily young. The dependency may be hidden in the service pricing or in the service duration. A trip to Tallinn is cheaper than a flight, however, tourists initially go there to get extra experience for a limited time. While being in Finland, many find it a valuable opportunity to visit another European country. Whether, at the Airport, tourists primarily were heading home, to another destination or North Finland. Interesting, that only 9% of the airport passengers preferred the Stopover option.

71,9 % of airport respondents were the first time travelers to the Helsinki Region. The Jätkäsaari share is slightly smaller, 66,7%. People who have been traveling to Helsinki for the first time, as it appeared, are more keen to share the experience and contribute to the survey. For them, it was an extraordinary experience during the trip to Finland, and they were happy to take part in the research. The majority of Jätkäsaari respondents have been in Finland for two nights, 30,4%. The 20,4% shared, that they have been in Finland for more than 5 days. 34,2% of airport passengers preferred to stay in Finland for 3-4 nights. Next most preferred option is from 5 to 7 nights, counting with 26,1%.

Majority of passengers have been using several transportation modes while traveling. Passengers choices are present in Figures 7 and 8. More than half of the passengers in the harbor and at the airport have used at least some mode of the public transportation options, in average 59.9%. Public transportation includes bus, train, bicycles, metro, and tram. Figure 8 shows what transportation modes have been chosen from public transportation the most. Interestingly, that the difference between the options is barely noticeable. Train, bus, and tram options account 28 – 29% each. Each option has been picked in average in 16% from all presented transportation options. Only metro have been picked less than others, counting only 15% from public transportation options, and 8,6% from all transportation options. There is an assumption, that metro has been picked less due to its journey limitations.
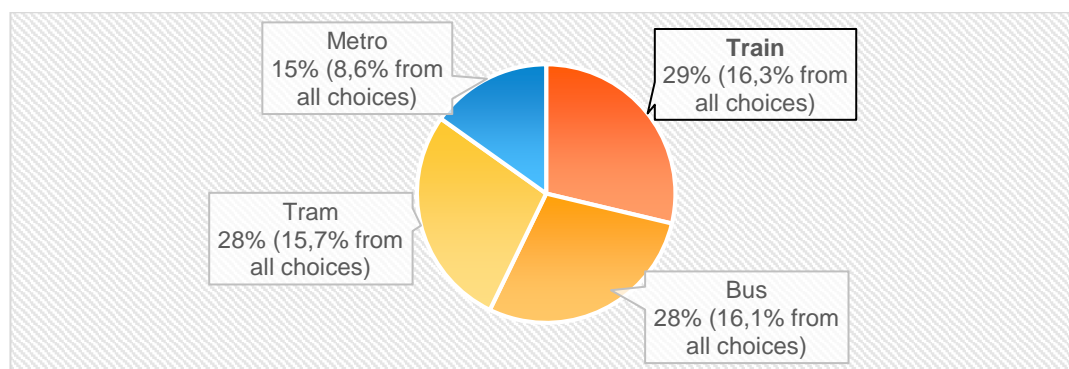

Figure 8. The share of used Public Transportation options in Helsinki Region.

Passengers in Jätkäsaari and airport have picked the walking option the most, 24,7% and 21,8% of all the respondents respectively. However, only walking considered nearly 6,7%. The walking option implied the distant journey by foot.

Besides the public transportation, harbor passengers have used taxies, ride/car-sharing and car renting options, counting together for 16,5%. Figure 9 shows how much each transportation option was picked by the West Harbour passengers. It illustrates that in majority Jätkasaari passengers have used walking and tram options.
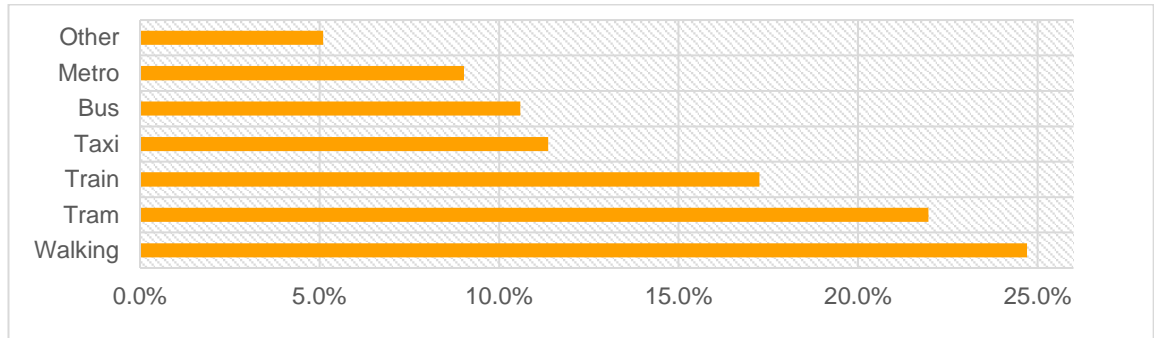

Figure 9. The transportation options choices. Jätkäsaari survey.

Figure 10 shows the share of Airport transportation option choices. Interestingly, that the deviation of the choices is fewer than in the Jätkäsaari choices. Meaning, that airport passengers have been utilizing more transportation options at once. Nonetheless, walking and bus options have been utilized the most, counting 23,2% and 21,8% respectively. The airport passengers have used a taxi in 11,4% of options and ride/car-sharing or rental cars for 3,9%.
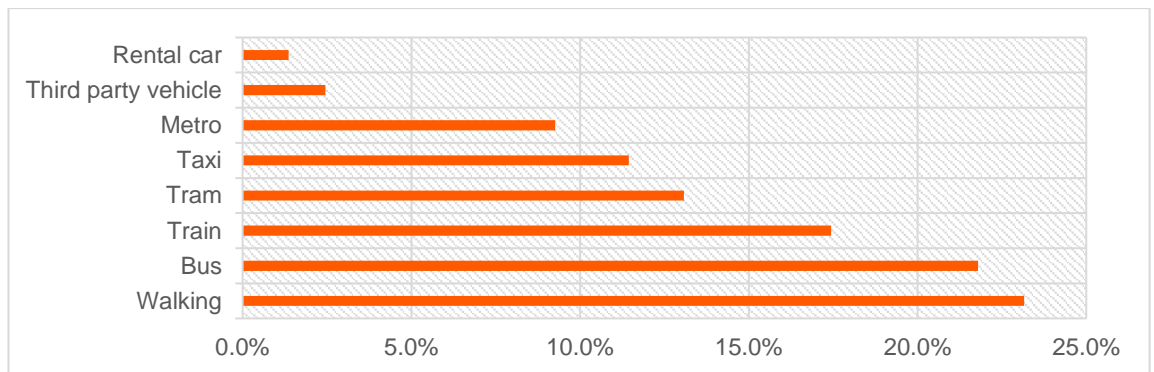

Figure 10.   The transportation options picks. Airport survey.

Altogether, public transportation has been picked in 63% of all the choices, making it the most preferable transportation option. Walking has 22% of all choices and taxi accounted for 11%. Other options, like the ride- or car-sharing account only 4%, meaning that this option is less preferable. Figure 11 illustrates the final share of transportation modes used in the Helsinki Region.
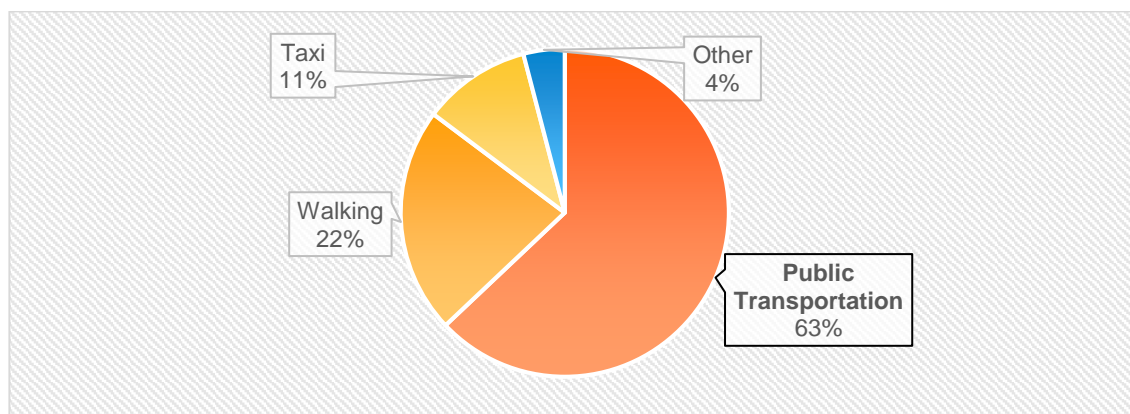
Figure 11.   The share of transportation modes used in the Helsinki Region.

In the majority, both airport and harbor passengers were not interested in having car/ride sharing or hourly car renting options. On average, nearly 30% were ready to use such services in the harbor, and 36,7% at the airport. Interestingly, that at the airport, nearly 45% of passengers would like to have an hourly car renting option. Whether, 67,1% of harbor passengers would like to have a ride-sharing option like Uber, Taxify or Lyft. Having the face-to-face interviews helped to establish, that in most cases people were unaware of such services and as a result, were not keen to use them. In most cases, passengers who have previously used some ride/car sharing/renting services at home, have either already used them in Finland or keen to use them. A great example is Uber service, which is well known worldwide and has been successfully utilized by international travelers.

During the Jätkäsaari survey, it was decided to investigate what means of payment the harbor passengers have used to pay for the transportation expenses during their stay. The majority, 54,5%, paid the expenses at the ticket vending machine. Only 25,7% have used mobile or online applications, such as HSL. 10,9% have not paid at all. Also, 19,8% have paid the expenses directly to the driver. Since the ticket purchases are eliminated from public transportation, there is an assumption, that those purchases have been done in the taxi.

At the airport surveys, passengers were asked what types of payment they would prefer. This information would find a gap between the demand and the offer. 45,9% of passengers would prefer to pay for services by Card and 28,2 %, still, would prefer Cash. Only 16,9% preferred to pay through mobile phone or online. It was assumed, that tourists would use more Card and Online payments (application, MobilePay et cetera).

Travelers have not used the mobile payment as much as was estimated, and they shared the desire to use Cash as a payment method.

6.3 Feedback from tourists

After analyzing the quantitative data, there have been conducted a work of processing the qualitative data. Qualitative data implies open-ended questions. Such questions were written by different people and in a different format. To make it easier to analyze, open-ended questions were recoded according to the Public Transport Passenger Rights and Quality of Service EU Standard - UNI en 13816. Such standard contains 7 categories, that define the transportation satisfaction: customer service, information, accessibility, comfort, availability, price and time. The categorization coding process was conducted by the thesis author. Each traveler's idea was coded by the standard category name, according to its definition. Figure 12 and 13 show the definition of each category. Figure 13 represents the most popular ideas among tourists, whether Figure 12 the least popular.

AVAILABILITY — Represents the availability of certain travel journeys and facilities. Also, includes destinations that were not available due to distance.

PRICING — Represents the customer's satisfaction with travel expenses: prices on public and private transportation

TIME — Represents the availability of transportation and travel services on evenings, weekends and holidays.
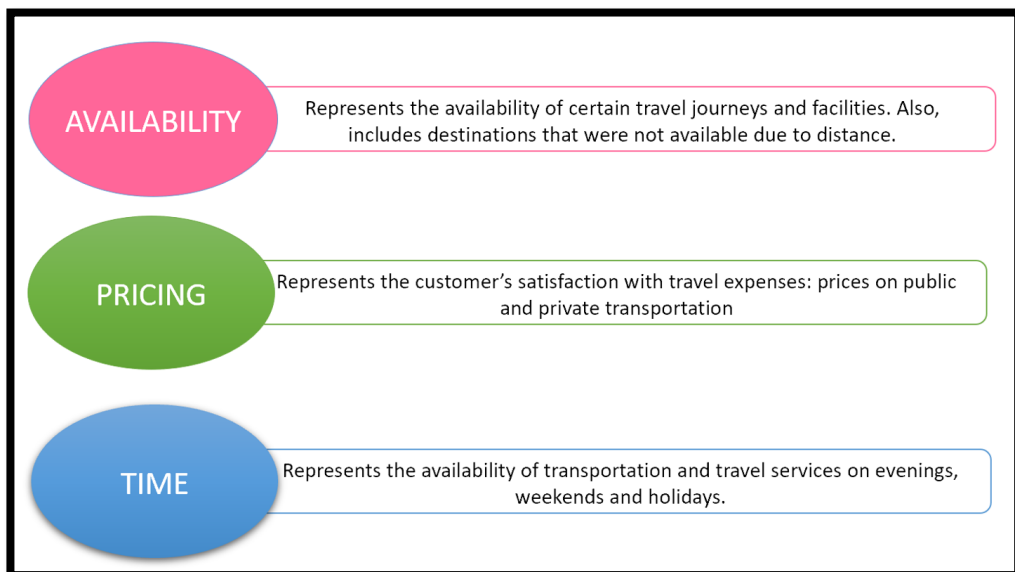
Figure 12.   Least popular EU Standard traveler's Improvement Ideas.
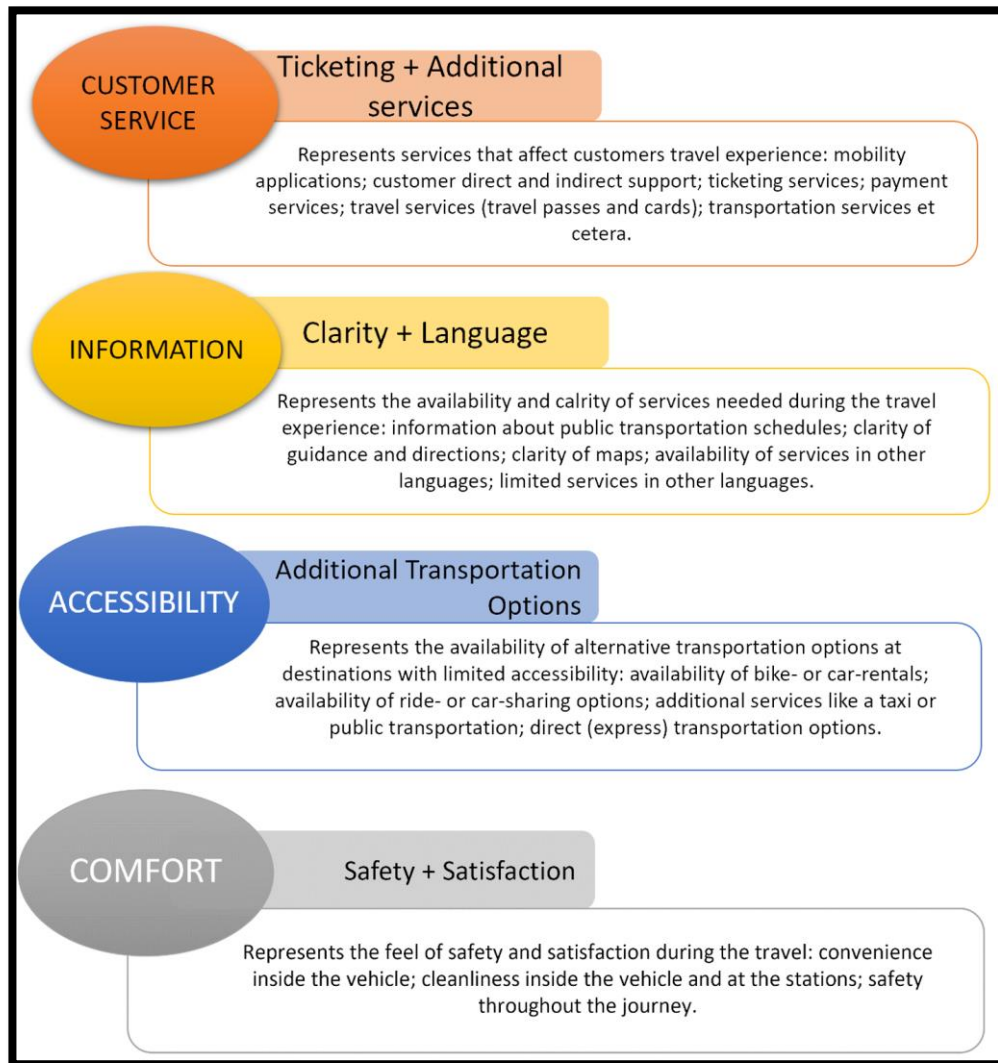
Figure 13.   The most popular EU Standard traveler's Improvement Ideas.

Figures 12 and 13 also define the sub-categories or detailed areas of improvement. Particularly, Customer Service includes areas like Ticketing and Additional Services. Information has Clarity and Language areas. Such additional areas define in a detail what tourists suggested to improve, which makes it easier to establish the most popular category and option.

34,7% of all the Jätkäsaari respondents had nothing to contribute to the improvement section. Figure 14 shows what improvement ideas have been suggested by the Jätkäsaari passengers. Customer service represents 36% of all improvement ideas. Next ideas are Information 29% and Accessibility 21%.
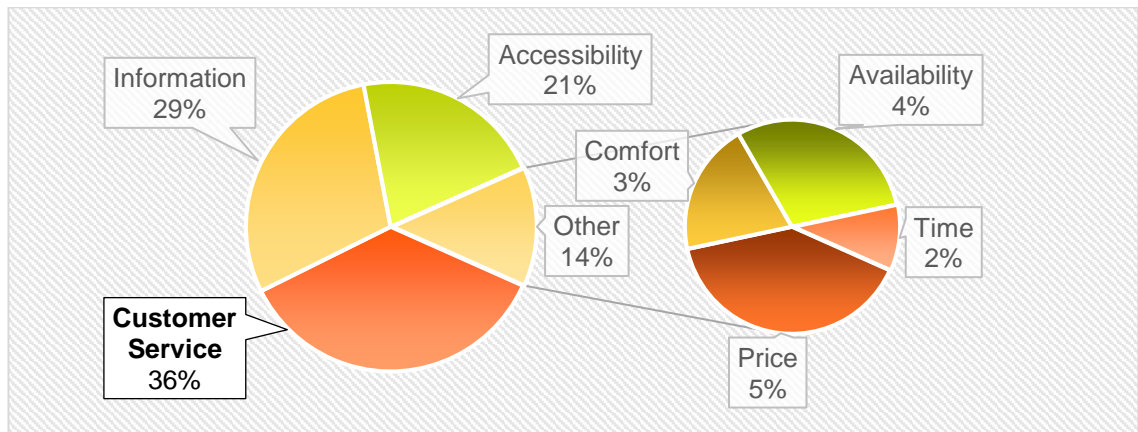
Figure 14.   The Improvement Ideas defined from the Jätkäsaari survey.

Customer Service and Information categories further defined in Figure 15. It shows that most travelers suggestions, thus 25% of all improvement ideas, were dedicated to ticketing issues. It means that in most cases people felt difficulties with buying the ticket for public transportation. It includes difficulties with finding the ticket vending machines and difficulties with buying processes. Accessibility is the next most common improvement area. It implies the availability of additional transportation options. In most cases, West Harbour passengers shared the need in services like Uber and direct (express) journeys from the Airport to the Terminal. There is an express bus operator, who provides the services on direct communications between the airport and harbor. However, there is no possibility to see the schedule, neither book or buy the tickets (ExpressBus 2018).
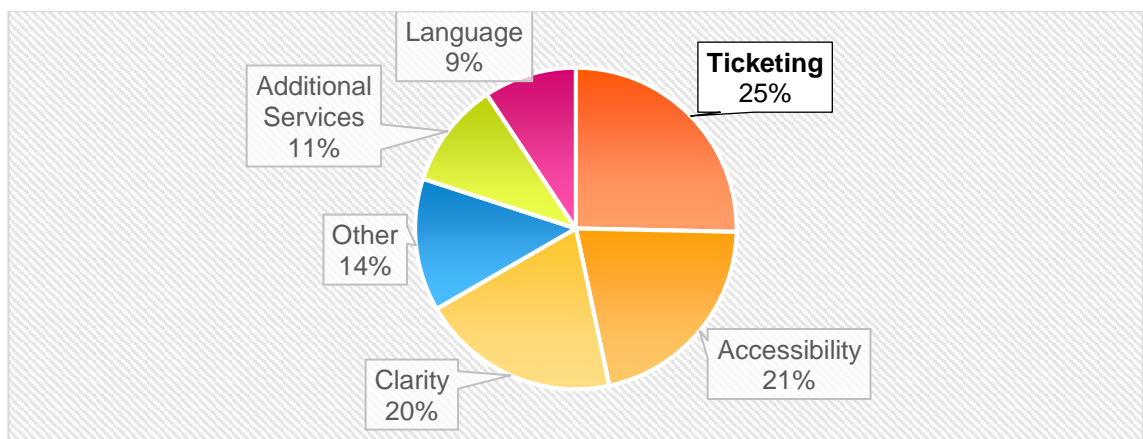

Figure 15.   Defined Improvement Ideas from the West Harbour survey.

Clarity, which represents 20% implies the difficulties in guidance. Many tourists faced challenges with finding the tram stations or understanding the transportation schedules.

Considering the density and limited accessibility of transportation options, such issues are most common in the Helsinki core city center. Chapter 4 mentioned that only trams are available for the Jätkäsaari journey, which makes the guidance to the tram stations inside the city center one of the most influencing mobility factors.

Interestingly, that additional services, language, availability, time, price and comfort improvement ideas were mentioned less. It means, that in most cases Jätkäsaari passengers did not feel discomfort with such categories. Which means, that for the Jätkäsaari passengers such features are satisfactory.
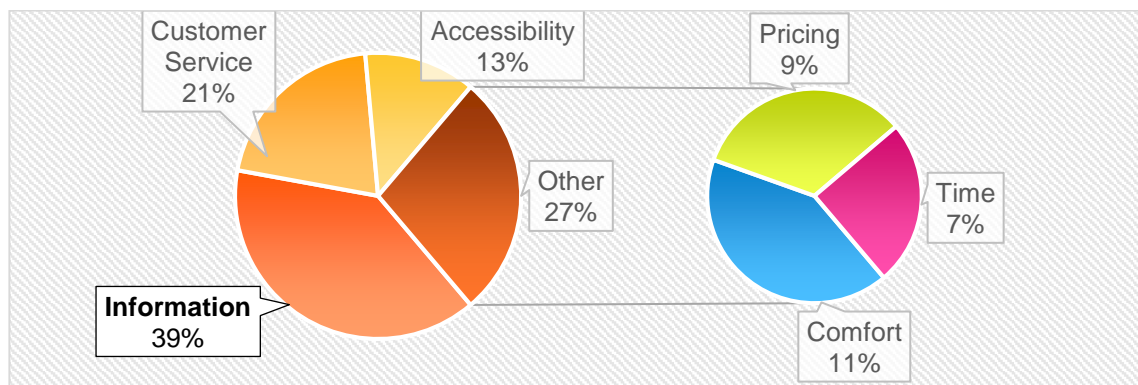

Figure 16.   The Improvement Ideas defined from the Airport survey.

Figure 16 indicates the improvement ideas from the airport survey. 43% of survey participants have contributed to the section, accounting 71 answers. Altogether, there have been accounted for 86 improvement ideas. Airport improvement ideas categories have been slightly adjusted since only a few passengers have shared challenges with ticketing and with the availability of other services. As a result, altogether there are only six categories among the airport improvement ideas.

 In comparison to the harbor results, the main improvement category at the airport is Information. Clarity and Language both considered significant – 54,5% and 45,5% respectively. It means that the majority of airport passengers had difficulties with guiding themselves through the airport and through the Helsinki Region. Furthermore, it includes the limited availability of services in other languages. Many Asian tourists were not able to independently to find the transportation or buy the ticket due to the language issues. Such improvement ideas are the most significant among airport passengers, thus, they influence the mobility the most.

During the survey question 7-9 (see Appendix 1 and 2), survey participants have been asked to share the reasons for not visiting planned destinations. The study showed that 62% of airport tourists declined their plans due to time. 18% due to the lack of information accessibility or customer service. 9% declined their plans due to weather conditions or motivation. Interestingly, that 32% of airport passengers have planned to visit Helsinki Region and declined their plans. 30% and 25% have planned to visit Northern Finland and other cities respectively.

At the harbor, only 18,8% of all the respondents had plans that they could not execute. 52,6% of which was due to the time constraints and 26,3% due to the accessibility issues. As a result, time is the main constraint during the travel. Time was often referred to a long distance, so that, destinations that were placed far away from the original location were often time-consuming. It was noticed that four destinations were most often caused complications: Suomenlinna, Marimekko, Sibelius monument, and löyly sauna. Interestingly, that they are placed in the peripheral city center.
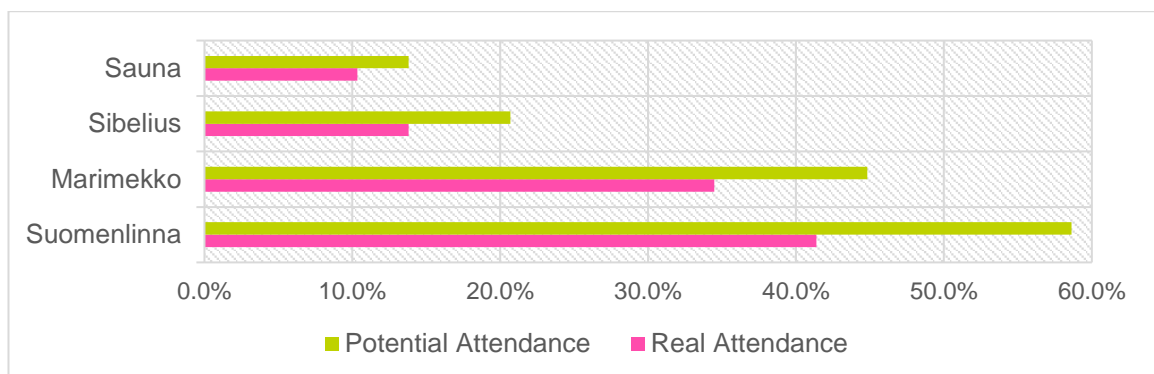

Figure 17.   The difference between the potential and real attendance of travel destinations. Jätkäsaari survey.

Figure 17 shows the difference between the real number of visitors and a possibility that was lost due to time and distance constraints. All the destinations are easily accessible by public transportation. The longest journey in public transportation takes around 40 minutes, whether shortest nearly 20. As a result, it is unclear why travelers did not find a time or possibility to reach planned destinations.

As a result, in average 57,3% of planned destinations were canceled due to a time constraint. In many cases, a time referred to the duration of the activity and destination distance. The distance may be perceived as long and time-consuming when the mobility

options are not well organized. Additional mobility options might be offered in the de-manded destinations, as a business opportunity.

To predict and define what type of destinations tourists would prefer to visit, the Airport passengers have been asked to share their preferences in destination types and budget range that they are ready to spend (see question 3 in Appendix 2). Figure 18 shows that Sauna/Swimming/ National Park is preferred as the first choice for 36%. As a second option, the Biking/Hiking/ Viewing Nature option was chosen, accounting 32%.
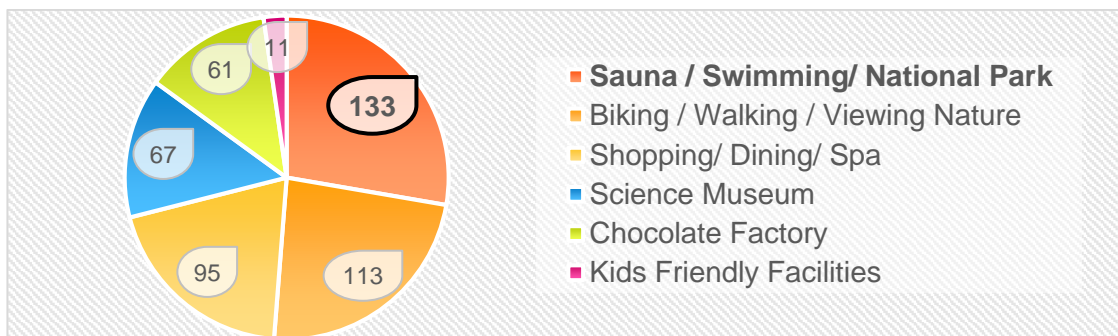

Figure 18.   The travel preferences choices picked by Airport passengers.

The most time that customers were ready to spend on any activity is 5 hours. The aver-age most preferred option was 1-2 hours per activity. Nearly 60% preferred to spend less than 50€ for each activity. The most spending range was on Shopping/Spa activities.

6.4   Combining results

The survey showed, that the majority of Helsinki Region commuters came for a holiday to visit the Helsinki Centre sights. The main motivation is culturally significant traditional activities or establishments. First-time commuters in most cases expect to visit Helsinki city center, even if they planned otherwise. Helsinki city center was mostly visited due to the availability of architectural establishments (Helsinki Cathedral, Market Hall, Uspenski Church, and et cetera). Considering the small distance between the establishments and free access, Helsinki city center is a doubtless tourist attraction point.

Price is not the most significant factor in the decision making. However, when tourists expected to buy something (like souvenirs, clothes, dinner et cetera), the budget limit grew. For sightseeing activities, like sauna or hiking, tourists were not willing to spend a

lot. As a result, if the expected leisure activity will give some feasible reward, tourist will more likely to spend more. The intangible experience is valued for a smaller budget. As a result, tourists expect the similar transportation value for the same experience. There should be more affordable price and convenient journey, in order to reinforce travelers to visit the experience destinations that are not highly valued. The journey is considered as challenging, when it is difficult to find services (like a taxi), find stop stations (like tram station near the Railway Station), read the map and sings, find schedule et cetera.

The notion of discovery is the most evident among airport passengers since primarily they have planned more differentiated leisure destinations, such as other Finnish cities, Lapland facilities, cultural and scientific events et cetera. Airport tourists, however, were keen to visit more and spend more in Vantaa Region as well. The Jätkäsaari passenger's destination choices, on the other hand, were narrowed to Helsinki area. Only a few have visited other cities, national parks et cetera.

The results show that the largest tourists' segment is people aged from 18 to 34. However, many have used cash to pay for their expenses and have not used as many mobile services, as was assumed. In most cases the methods of traveling primarily used outdated and well-known approach. Such an approach, most likely, caused difficulties with ticketing and information. Mobile applications and service make payments and guidance more convenient, universal and flexible. Furthermore, it is much more possible to arrange the translations.

As a result, the behavior patterns show the shift in awareness and information accessibility limits. Tourists are not informed on mobility, payment, and other services options. Potentially, tourists are interested in using shared mobility options and visit new places, thus, experience something new.

7   Conclusions and recommendations

The purpose of the thesis was to research the smart mobility industry from different perspectives and evaluate its applicability in Finland. As it appeared, Finland legally and financially supports developments in, "smart" developments and welcomes new stakeholders. The surveying proved that smart mobility solution's potential for new developments is promising.

7.1   Summary

To attain the knowledge on the thesis objectives, several questions, answers on which are present below were performed:

What is defined by smart mobility and what it involves?

The research showed that smart mobility is largely utilized in the newest urban infrastructure developments, so-called "smart city" projects. The goals of smart mobility are achieving green, efficient, safe, sustainable and accessible transportation for any stakeholder (people, goods, data). The global society is towards sustainable development, and smart mobility is a perfect tool to achieve it. Smart mobility solutions are either mobile services or technology developments (solutions and vehicles).

Mobility services, in turn, are either shared (ride/car/bike/scooter sharing and renting), informative (finding, guiding, informing) or multifunctional (ticketing, booking, synchronizing, combining, evaluating). Smart mobility services are developing around the world; however, Finland is leading. Finland has already introduced the "Mobility as a Service" term and first mobility solutions, such as Kyyti, Tuup, Whim. Smart mobility technology developments include automation and robotization solutions. Those might be applied either in transportation modes, such as RoboBusLine. Or as the automated solutions, such as indicators of the free parking spot and construction of the automated parking lot. Such solutions require specialists and relating regulations.

The smart mobility has faced enough critics. Primarily, people are either feeling unsafe or feeling that they have been treated unfairly. Safety issues include the danger from

self-driving vehicles, the shared mobility employment regulations, electric vehicles usage, privacy evading and infrastructure readjustment. Unfairness contains in legislation that is not yet regulated or controlled, which make some services too advantageous.

Nowadays, smart mobility solutions are so deeply integrated into the urban mobility, that tourists have also taken a role in its development. Since the European, as well as, Nordic countries tourism are growing, it is important to consider tourists customer segment. Furthermore, tourism has also been influenced by many smart innovations, which shape customer behavior. As a result, tourist's expectations, needs, wishes, and culture may give a new look at the domestic development of smart mobility.

What are the tourists´ expectations and preferences for mobility options?

Tourists expectations were defined by the 4 questions (see Chapter 5.1), analyzing travel expectation type, budget, time and convenience. Tourists expect to visit the Helsinki city traditional locations. They expect to have information on available transportation modes, payment methods, application, and additional services on their home language. They would like to have a free choice regarding payment methods for transportation.

Referring to the traveler's decision-making research (see Chapter 5.1), factors like time, quality and costs create a pattern that defines the worth of experience. Survey study showed that in most cases Helsinki Region travelers denied their plans due to time. It means that the time feature was so negative (so long), that the experience destination was not set high enough. To reinforce travelers to visit such destinations, both costs and quality should be set high. Thus, pricing for the journey should be cheap and convenient. Planning, booking, payment of the journey should be easy and fast.

Overall, tourists expect to have an easy and fast access to every facility, such as payment, transportation, establishments et cetera. More of that, they would prefer the cheapest options. Many expressed the enthusiasm for services like Uber. As a result, tourists expect to have alternatives like this – the cheap, flexible and mobile. The study showed that alternatives are yet to be discovered by tourists. So, tourists expect to see and use something they already know in advance.

What mobility solutions might be recommended to be offered to travelers in the Helsinki Region?

The study proved that Finland is one of the most suitable locations for smart mobility solutions execution. Regulations allow applying robotics and self-driving vehicles. Sharing services are acknowledged and new regulations have taken place already. European Union and many transportation organizations are supporting the developments in the sector and reinforce the growth. As a result, Finland allows integrating ICT systems, payment and ticketing services, and mobile packages.

The detailed recommendations for smart mobility offerings in Helsinki Regions are presented in Chapter 7.2.

7.2   Recommendations

The improvement recommendations for the smart mobility services in the Helsinki Region are provided in this section. According to the improvement ideas that were received from the Jätkäsaari tourists, there might be given few development recommendations:

- The Helsinki city center is the key attraction for the majority of the tourists. As a result, there might be found smart mobility solutions that would improve the access to the transportation systems and payment methods.

- The information system in the enlarged city center is also limited. Digitalized services are limited. Signs and guidance instruments are challenging to understand. Desired destinations located in a distance from each other. As a result, smart mobility solutions may focus on improving the travel experience in the area with limited access.

- The peripheral city area of Helsinki contains locations that are placed in a long distance from each other. Locations are unreachable by walking. Many tourists declined the journey, although they have planned it. The smart mobility solutions may improve the accessibility of alternative transportation options. The combination of public and private transportation will be benefitting at the area the most.

There has been mentioned some interesting ideas, that were statistically not sufficient, but the thesis author assumes, that they might be successfully utilized for the smart mobility solutions. Such interesting ideas include:

- Luggage storage services, that would make backpacking tourism more convenient (cargo-bike);
- Such attractions as Marimekko Outlet and Moominland are popular among Japanese tourists. They would appreciate some transportation passing through those facilities or arranges packages;
- Voice announcements in public transportation;
- More accessible taxi services (easy to find and book);
- The direct (express) transportation connection between the airport and West Harbour.

The research at the airport shared similar improvement ideas. Although, the biggest emphasis was on language matters. The airport should distribute and promote necessary information on transportation and payment options within Helsinki, Vantaa, and Espoo. Focusing on alternatives like a car- or ride-sharing, ride-sourcing, car-pooling et cetera.

The official sources of travel information should be present in many languages. Official websites or well-known information mobility services, like HSL, could include a large range of languages. Mobile services make payments and guidance more convenient, universal and flexible. Furthermore, it is much more possible to arrange the translations in mobile software, rather than in physical formats.

Time spent on some leisure activity is often estimated wrong. Some services that will count the amount of time spent on the journey and the average time spent on popular destinations, may improve the travel journey planning process. The travel journey planning may be offered by mobile services. Destinations from the Kauppatori -Suomenlinna – Marimekko – Sibelius monument – löyly sauna – Kauppatori, as an example. The service may count the average time spent on each activity and offer possible transportation options to each location. It might be performed as an "Activity Journey Planner". High fees for the service will highly likely drive away the tourists.

Price feature was not well mentioned by the tourists since it was not the prior reason for canceling the journey, neither an improvement idea. However, unintentionally price influenced their evaluation of the services. Prices on public transportation and other alternatives (Uber, Taxify) should be lowered.

7.3 Conclusion

The analysis of the traveler's mobility expectations in Finland, particularly in areas of Helsinki Region, proved the relevance of necessity of applying and further researching smart mobility solutions. The outcome of the expectation's analysis evidenced the need in additional or alternative mobility options.

Further research should consider the geographical location and research areas. The Helsinki-Vantaa Airport focuses on becoming a transit hub for Asian travelers. Whether Jätkäsaari terminal contained Estonians in the majority. As a result, it would be challenging to reproduce the study with the same circumstances. This work is primarily applicable to the Helsinki Region. Airport research might be also applicable in Northern Finland, where the largest customer segment is tourists arriving from Asian countries (Yle 2017b).

Worth to mention, that some valuable customer segments were not participating in the survey since they were not present: families with small kids, people with disabilities and elderly population. Mentioned customer segments are growing in numbers, hence, their contribution to urban mobility is critical to acknowledge (Musselwhite 2018: 4-7). As a result, the conducted survey is relatively straightforward and does not represent the accurate results. Citizens also influence the tourist's decision making. Tourists see what residents chose, or they ask locals what services to choose. The urban transportation experience should be changed towards using multiple transportation modes through digital services. This will shape the citizen's behavior and routine, which will influence the tourist's behavior.

The reliability and validity of the study have been also approved. The survey and analysis processes are transparent and could be reproduced. The Airport survey is a reproduction of the Jätkäsaari surveying process. Although many circumstances of the survey were not completely complied, the results appeared to be similar. The validity of the study is compromised. Although the results and improvement ideas presented in this work are objective, the recommendations are based on the thesis author's subjective deductions.

According to the studied literature review, personal experience and views on mobility, the recommendations were suggested. As a result, results that have been presented in this work might be interpreted differently.

To conclude, the analysis of traveler's expectations in the Helsinki Region gave insights on the mobility situation in Finnish capital area. The study showed that the majority of tourists lack the awareness of the alternative transportation modes, even if such were available. The thesis author assumes, that the smart mobility services and solutions are not yet perceived by the local commuters and residents on its full capacity. Many services are not well promoted or being delivered not accurately. In reality, many residents use either public transportation or private vehicles. The awareness about alternatives is not integrated, and services remain unused.

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Jätkäsaari final survey, as a part of the Last Mile project.

1. Did you visit any places or participate in any events in Helsinki Region?
    a. Yes
    b. No (the transit survey alternative)
2. What was the main purpose of your stay in Helsinki Region?
    a. Business or science visit
    b. Leisure or holiday visit
    c. Sporting contest
    d. Visiting friend(s) or relative(s)
    e. Other (open-ended)
3. How many times have you visited the Helsinki Region before?
    a. First time
    b. More than one
4. How long did you stay in the Helsinki Region?
    a. A day
    b. One night
    c. Two nights
    d. 3-4 nights
    e. 5-7 nights
    f. 8 nights or more
5. Write the name of the 3 main places you visited or events you went during your stay: (open-ended)
6. Which of these places or events were difficult to reach? Why? (open-ended)
7. Did you plan to visit other places or go to other events but for some reason(s) you could not? (open-ended)
8. Write the name of other places or events you were interested in, but could not go: (open-ended)
9. What was the reason(s) for not going to such places or events? (open-ended)
10. Please share your idea(s) about how to improve the travel experience in the Helsinki Region? (open-ended)
11. What type of transport system(s) did you use within the Helsinki Region? (multiple choice)
    a. Walking
    b. Train
    c. Tram

    d. Bus

    e. Metro

    f. Taxi

    g. Third-party vehicle (friend, relative or colleague)

    h. Uber or similar service

    i. Ride-sharing (one-time shared ride with other passengers)

    j. Other (open-ended)

12. Would you be interested in using service such as: [Car-sharing (Rent car by the hour)]

13. Would you be interested in using service such as: [Ride-sharing (One-time shared a car ride with other passengers)]

    a. Yes

    b. No

14. Would you be interested in using service such as: [Uber and similar service]

    a. Yes

    b. No

15. Where did you make the payment for your travel expenses within the Helsinki Region?

    a. At a ticket vending machine

    b. Apps & online services

    c. In the vehicle from the driver

    d. It was included in a package (with other activities or/and with my airline/ferry ticket)

    e. Other (open-ended)

16. What is your country of residence? (open-ended)

17. What is your age?

    a. 18-24

    b. 25-34

    c. 35-44

    d. 45-54

    e. 55-64

    f. 65+

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Airport survey, as a part of the Last Mile project.

1. What locations did you visit While in Finland? What in the Helsinki region? (open-ended)

2. What transportation did you use in the Helsinki region?
   a. Walking
   b. Train
   c. Tram
   d. Bus
   e. Metro
   f. Taxi
   g. Third-party vehicle (friend, relative, colleague)
   h. Rental car
   i. Other

3. Would you be interested in visiting these close by attractions (15-30 min travel time from the airport)? Choose 3 most interesting (
   i. Sauna/ swimming/ national park;
   ii. Biking/ walking/ viewing nature;
   iii. Shopping/ dining/ Spa experience;
   iv. Chocolate factory;
   v. Kids-friendly activities;
   vi. Science museum.

   b. How much time would you be willing to spend there? (
      i. less than an hour;
      ii. 1-2 hours;
      iii. 3-5 hours;
      iv. 6 hours or more.
   c. How much would you be willing to pay for the attraction + transportation to get there?
      i. Less than 50€
      ii. 50-100€
      iii. 100-200€
      iv. 200-500€
   d. How would you most prefer to travel to this activity? Choose 1-2 preferred?

      i. Public transportation (Bus/train)

      ii. Bike

      iii. Car-pooling/ ride-sharing

      iv. Taxi

      v. Transportation organized by a tour operator

      vi. Rental car (rent by day)

      vii. Car-sharing (hourly rent)

      viii. If other, specify (open-ended)

4. Would you be interested in using service such as: [Car rental by hour] [Carpooling/ Ride-sharing (one-time shared ride with other passengers)]

    a. Yes;

    b. No;

5. How would you MOST like to pay for the activity and transportation?

    a. Card

    b. Cash

    c. Mobile phone payment (e.g. Alipay)

    d. Prepaid online

    e. Through a trip planning app

    f. If other, specify (open-ended)

6. Did you plan to visit any places, but for some reason did not? Why? (open-ended)

7. Please share your idea how to improve the travel experience in the Helsinki capital Region. (open-ended)

8. What is your age?

    a. 18-24

    b. 25-34

    c. 35-44

    d. 45-54

    e. 55-64

    f. 65+

9. What is your purpose of the visit?

    a. Leisure/Holiday

    b. Stopover (staying in Helsinki shortly between switching flights)

    c. Visiting friends and family

    d. Business

10. Time spent in Finland.

    a. 5-12 hours

      b. 1 night

      c. 2 nights

      d. 3-4 nights

      e. 5-7 nights

      f.   8 nights and more

11. Country of residents? (open-ended)

12. Is it your first time in Finland?

      a. Yes

      b. No

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Definition of destinations by the type. Jätkäsaari research.

Architectural Establishments	
Helsinki Cathedral	24
Rock Church	9
Uspenski Cathedral	8
Railway Station	5
Ferry Terminal	4
Church/Cathedral	16
Chapel of Silence	2
Palace	1
Castle	1
Kallio Church	1
Helsinki City Hall	1
Pier	1

City Parks And Islands	
Suomenlinna	12
Sibelius	4
Zoo	2
Nuuksio National Park	1

Art and Culture	
Sauna	3
National Museum	2
Design Museum	2
The Finnish National Opera	2
Design District	1
Music Hall	1
Ateneum	1
Symphonic Orchestra	1
Modern Art Museum	1
Excibition	1
Museum	2

Specific Destinations	
Olympic Stadium	1
Ice Hockey arena	1
Car drifting event	1
Ice skating rink	2
Jätkäsaari	2
Aalto University	2
Helsinki University	1
Supermarket	1
Car drifting event	1
Messukeskus	1
Alko	1

Retail Centers	
Marimekko	10
Shopping center	7
Iittala	1
Arabia Center	1
Aleksanterinkatu	1
Forum Center	1

Gastronomy	
Market Square	8
Old Market Hall	5
Market	4
Hakaniemi Market	1

General Destinations	
City Center	3
relatives	1
Business Park	1
Espoo	1
Business Trip	1
Rovanimi, Ivalo	1
Hakaniemi	1
Walking Tour	1

Bar and Restaurants	
Restaurants	3
Bars	2
Cafe	2

Architectural Establish	73
Retail Centers	21
City Parks And Island	20
Gastronomy	18
Art and Culture	17
Specific Destinations	14
Not Specified Destina	10
Bar and Restaurants	7

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