

A bicycle friendly city, a possibility or a dream?

An analysis of the bicycle's status and possibilities as transportation in the city of Reykjavík, Iceland



LUNDS
UNIVERSITET

Institutionen för teknik och samhälle
Avdelning trafik och väg

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LTH, Institutionen för Teknik och samhälle
CODEN: LUTVDG/(TVTT-5200)/1-116/2012
ISSN 1653-1922

Tryckt i Sverige av Media-Tryck, Lunds universitet
Lund 2012

Examensarbete

CODEN: LUTVDG/(TVTT-5200)/1-
116/2012

Thesis / Lunds Tekniska Högskola,
Institutionen för Teknik och samhälle,
Trafik och väg, 234

ISSN 1653-1922

Author(s): Sunna Ósk Kristinsdóttir
Title: En cykelvänlig stad, dröm eller möjlighet?
English title: A bicycle friendly city, a possibility or a dream?
Year: 2012
Keywords: (5-6 st) Bicycle traffic; cycle infrastructure; traffic mode; cyclist;
transportation; modal split
Citation: Sunna Ósk Kristinsdóttir, A bicycle friendly city, a possibility or
a dream. Lund, Lunds universitet, LTH, Institutionen för Teknik
och samhälle. Trafik och väg 2012. Thesis. 234

Abstract:

The aim of this thesis is to assess the current situation and status of bicycle traffic within the city of Reykjavík, focusing especially on two different routes. This is performed by first presenting the current situation of the bicycle as a transport mode in the city of Reykjavík, followed by a literature study on the subject of increased cycling within cities. An observational analysis, that shows the current status of the bicycle infrastructure within the city, reveals the lack of focus that has characterized cycle planning within the city up until the year of 2010, when a city cycle plan was compiled. In order to expand understanding of the current and future situation both city planners and city officials involved in traffic and cycle planning were interviewed, along with the users of the cycle network. These two groups expressed their views on cycling in general as well as cycling within the city of Reykjavík. Their attitude towards the current situation depends greatly on the type of cyclist, the more experienced, everyday cyclist prefers cycling on the streets alongside other traffic modes while the leisure cyclist prefers specific cycle infrastructure. A common perspective among all the cyclists however seems to be that more focus should be put on cycling within traffic planning in general, and the city planners and officials seem to agree with the cyclists on this issue.

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Preface

Living in Lund made me realize the convenience of using the bicycle as transportation. When I moved back to Reykjavík I got right back to using the car for literally any errand. This made me want to investigate the reason for this and hence this research topic of cycling in Reykjavík was born.

First and foremost I would like to thank my fiancé for his patience during my work on this thesis. Also, I would like to thank my family and friends for their encouragement throughout this project. I would also like thank all of my respondents, who took the time to meet with me and answer my questions.

My supervisor, Till Koglin and examiner Áse Svansson also deserve their share of thanks for answering and commenting on all questions thrown at them.

The experience of writing this thesis has been educational, and has inspired me to do further research in this particular field.

Reykjavík, June 2012

Sunna Ósk Kristinsdóttir

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Summary

According to surveys conducted each year in Reykjavík the majority of its residents choose the private car as transportation on a daily basis. City planning has up until now mainly favored the automobile even though a slight change in policies indicate a change, with the focus on sustainable transportation and a denser land use. Poor quality of public transportation excludes it from being a viable option but given the bicycles popularity as a transport mode in neighboring cities in Europe, focus on that particular travel mode might yield good results. The city of Reykjavík has already taken a step in that direction with the release of the city cycle plan published in 2010.

This thesis aims at assessing the current situation of bicycle traffic in the city of Reykjavík focusing on two distinct neighborhoods with various characteristics. This is done by partly researching data on the subject along with interviews and analysis. The thesis is divided into four parts which all contribute to the conclusions at the end of the thesis.

The first part covers relevant facts about the city of Reykjavík, such as key figures regarding the size of the city and its population of 119,000 inhabitants, the city's climate which compares relatively well to its Scandinavian counterparts in terms of temperature, apart from the fact that the warmer summer months do not last as long. The most recent travel survey from 2011 shows that 3.8 % of people within the city of Reykjavík currently do cycle (which is an increase from 2002 when 0.3 % of people cycled), 14.9 % walk, 4 % use public transportation and 78 % of people are drivers or passengers in a car. This part also includes a summation of policies and city plans that touch upon sustainable transportation and means to increase its share in the modal split. The second part of the thesis introduces results of a literature study. It goes to show that most people like cycling since it is fun, convenient and gives good exercise and fresh air in your lungs, as well as being cheap and environmentally friendly. Therefore these turn out to be the most common reasons to why people choose to cycle. Most people also agree that a decrease in the number of people driving results in improved preconditions for cycling. The reasons for cycling can be either for leisure purposes or as a travel mode and these reasons affect the way people perceive cycling. The most common obstacles for cycling turned out to be, to name a few, bad weather, lack of infrastructure and hilly paths. Weather conditions seem to be most important to those who only cycle during the summer while exercise is an important factor to those who also cycle during the winter months. Various survey results also show that the travel mode of those who usually drive a car and never cycle to work are the hardest to influence.

More cycling lanes and a smoother surface for cyclists seem to be the most important factors when considering cycling infrastructure. Another important factor is that the

planning of the cycle network should exist in the overall major plans of a city and should not be added afterwards since it is part of the overall traffic network.

Governmental policies can play a large role in promoting various travel modes. In cities with high cycling volumes local authorities have focused on making their cities people-friendly rather than car friendly, by governing the expansion of the private car and its almost proprietary right to city space.

Possible measures to increase cycling involve programs to encourage people to cycle, and cycle more often, surveys where cyclists evaluate the actual performance of the cycle network which allows planners to evaluate and track progress over time, inschool training where children learn safe and efficient cycling techniques and campaigns with incentives for the cyclists.

The third part of the thesis is an observational analysis, in which a checklist is compiled from literature of what constitutes as good cycling infrastructure. This checklist is then used for an on-site analysis of two main routes, from the two neighborhoods studied, to a joint destination at the residential center of the city. Even though the two routes varied in distance the longer route gave a smoother and more comfortable ride which resulted in similar travel times.

The fourth part of the thesis presents results of interviews with cyclists who live within the two neighborhoods and use the bicycle as a travel mode, either solely or occasionally. The respondents shared their perceived benefits and detriments along with reasons for cycling. They were also asked about what they felt were the most important improvements to the cycle network. Most of them mentioned more cycle paths and paths that are separated from pedestrians.

This part also presents results of interviews with city officials and a city and traffic planner where they express their views on the bicycle's current status as a travel mode along with the city's planned measures to increase the bicycle's modal split, along with improvements to the bicycle network. The city's current focus within transport related issues is entirely on cycling and almost all investments towards transportation within the city are going towards cycling.

The conclusion of the material presented in the thesis indicates that there has been an awakening among the city's administration about the need to increase the bicycle's modal split, even though this has not encouraged them to notably invest in cycle related measures until this year of 2012. The city might benefit from integrating more propaganda related measures combined with tangible rewards for those who cycle, along with push and pull policies that make the bicycle a more attractive travel mode than the private car.

1 Introduction

1.1 Background

The city of Reykjavík has one hundred and nineteen thousand inhabitants. (Hagstofa Íslands/Statistics Iceland, 2011) According to travel surveys conducted every year the majority of these inhabitants choose the private car to transport to and from work on a daily basis. (Capacent Gallup, 2010) The central city has limited space to accommodate additional car traffic. Any available space is viewed more important for building apartments for the increasing number of people wanting to live close to the city centre. Thus it is important to look for other modes of transportation which the public is willing to use as a substitute for the private car.

Throughout the years city planning in the city of Reykjavík has been more in line with the US way of city planning, the city is planned mainly with the automobile in mind, with large streets and intersections dividing neighborhoods and creating an urban sprawl (the city covers almost 300 km²). In recent years some of the city officials and city councilmen, in charge of forming the city of Reykjavík's planning policies seem to be moving towards the European way of sustainable city planning with focus on a denser city and increased use of sustainable transportation. (Reykjavíkurborg - Skipulags- og byggingasvið, 2012)

The quality of public transportation has not been considered particularly efficient the last couple of years and has throughout the years mostly been used by adolescents, elderly people and people of low income. Due to this poor standard, e.g. large headway (long time between buses), the need to switch buses on short trips and a high bus versus car travel ratio, many do not even consider public transportation as a viable option. However, due to the recent recession there has been an estimated 1.3 million passenger increase between the years 2010 and 2011. Increased funding to Strætó bs, the company that runs public transportation within the city of Reykjavík, aims to get an even higher increase over the next few years (Haraldsson, 2011) which hopefully results in better public transportation to complement the future goal of a more sustainable Reykjavík.

The bicycle is a popular transport mode in neighboring metropolitan cities in Europe such as Copenhagen and Amsterdam but has not been as popular in the city of Reykjavík; a main reason might perhaps be the climate and topography of the Northern city. Another reason might also be lack of cycling infrastructure and not much attention being paid to cyclist within the city planning, until recently. It was not until the year 2010 that the city created the city cycle plan, which includes ambitious goals to raise the standard of the current cycle network alongside other measures, thereby raising the bicycle's modal split. With the majority of people currently making their daily trips using the private car the city's lack of an actual cycle plan is no surprise.

1.2 Aim/Goal

The aim of this thesis is to assess the current situation of bicycle traffic in the city of Reykjavík focusing on two distinct/unlike neighborhoods; Breiðholt and Hlíðar, and the condition of existing bicycle networks that connect these two neighborhoods to a joint destination in Skeifan, as well as evaluating planned improvements to the network from the cyclist's perspective. Furthermore this thesis will contribute to solutions on how to collaborate the wishes of the cyclists to the city planners and city officials in charge of decision making. It is the aim of this thesis to develop basic and thorough knowledge of what cyclists feel about cycling in their neighborhoods as well as on specific routes and how their experience relates to the actual infrastructure and on the planners and politicians view. Moreover the aim also includes evaluating the existing infrastructure in the two neighborhoods from a traffic engineering perspective, meaning to evaluate it in terms of safety, accessibility, surface quality and ease of use, with special focus on the two routes connecting the neighborhoods to a work central in Skeifan. In order to develop this knowledge the following research questions are put forward:

What is the current status of the existing bicycle infrastructure on the routes connecting the two neighborhoods Breiðholt and Hlíðar to Skeifan?

What do cyclists feel about cycling within the two neighborhoods and to and from work and from their own experience, what do they feel works well and what does not?

What do cyclists feel is important when planning the cycle network in the two neighborhoods and in Reykjavík?

What do planners and politicians think about cycling in Reykjavík, and what are their views on how to increase cycling?

Are there any official plans for improvements or additions to the existing bicycle network infrastructure on the two routes?

1.3 Method and setup of report

The thesis is divided into five main parts.

It begins with an introductory chapter on the city of Reykjavík and facts of interest about the city.

To address the subject of increased cycling in detail, and extend the authors knowledge of the subject, the thesis continues on with a literature study, including examples from other countries/cities that have successfully increased cycling at the expense of other less sustainable transport modes. Literature was acquired by recommendations from the thesis work supervisor and by searching for relevant topics in literature within the subject of traffic planning.

The thesis is divided into two empirical parts:

- An observational analysis conducted by the author where literature on the subject of what constitutes as good cycling infrastructure is examined and compiled into a checklist, which is then utilized in an on-site visual analysis of one main route from each neighborhood to a joint destination. All this is done in order to assess the current condition of existing infrastructure.
- A qualitative analysis using data from in-depth interviews with, on the one hand, users of the cycle network, and on the other hand representatives from the city's planning sector. One city planner who handles planning within the city and two politicians involved in decision making within city planning. The in-depth interviews are limited to 45 minutes per person.

In order to prepare for the interview process a few key notes were acquired from Denzin (2005) such as the importance of the interviewer remaining totally impartial in all parts of the interview in order to fulfill the main goal, which was to get the interviewee's point of view of the matters in question.

According to Kvale (2009) a qualitative interview goes beyond the following of rules and depends on the interviewers' skills in posing questions. It is important to possess conceptual knowledge of the subject matter when conducting and analyzing interviews and during the interview process the seven stages of interviewing mentioned in Kvale (2009) were used for guidance. They are as follows:

1 - Thematising – Involves formulating the purpose of the investigation/interviews. The interviews in this thesis are primarily descriptive and aim to record the subjects' opinions on the matter at hand, which is their cycling experience.

Obtaining of intended knowledge also falls under this stage and is done by performing a literature study, as mentioned earlier in this chapter, in order to be able to pose relevant questions during the interview.

2 – Designing – Involves planning the design of the study, how the study is supposed to be performed in relation to all of these seven stages. In this stage the number of interviews are determined to be 9 cyclists and 3 representatives from the city (the number of interviews in common interview studies tend to be around 15 ± 10)

3 – Interviewing – This stage involves the execution of the interviews based on a preconceived interview guide which consists of suggested questions with an outline of topics to be addressed.

4 – Transcribing – Involves preparing the interview material for an analysis by transcribing oral speech to written text

5 – Analyzing – This stage involves deciding which modes of analysis are appropriate. In this investigation/study meaning condensation, where long statements acquired from the interviews are compressed into briefer statements where the main point of what is said is rephrased in a few words, was mainly used. First, a compilation in bulletin form for each interview was assembled, then all the interviews were compiled into a table in order to locate similarities.

6 – Verifying – Involves determining the reliability of the interview findings.

7 – Reporting – Sharing the findings of the study and the methods applied.
(Kvale & Brinkmann, 2009)

Finally, the thesis is wrapped up with a conclusion.

1.4 Limitations

Even though parts of the thesis cover cycling in the city of Reykjavík in general the thesis' main focus is on two distinct neighborhoods within the city, Breiðholt and Hlíðar, similar of size but with different bicycle networks, varying proximity to the city center and difference in the share of cycling's modal split within the areas.

The interviews have a limited number of persons spoken to and are therefore not comprehensive for the views of the mass as well as all interviewees being solely people who cycle.

Furthermore, the city officials interviewed were chosen because of their involvement in transport related issues (especially cycle related issues) within the city sector and therefore their attitudes towards the subject might be biased.

1.5 Facts of interest regarding the city of Reykjavík

1.5.1 The city of Reykjavík

Iceland is a European island in the North Atlantic Ocean, with a population of 319,000. (Hagstofa Íslands/Statistics Iceland, 2011) The city of Reykjavík is the capital of Iceland, located on the Southwestern coast of the country, on a peninsula and therefore surrounded by the sea on three sides. It is the largest city in terms of area and inhabitants, around one hundred and nineteen thousand inhabitants (119,000) live within the city's 277 square kilometers. This results in a density of 429 persons per square kilometer. (Landmælingar Íslands, 2010) For comparison, Reykjavík's neighboring Scandinavian capitals such as Stockholm, with eight hundred sixty five thousand inhabitants (865,000) who live within the city's 188 km², has a density of 4,309 inhabitants per square kilometers, and Copenhagen, with five hundred forty nine thousand inhabitants (549,000) who live within 88 square kilometers, has a density of 6,200 inhabitants per square kilometers. (Stockholms stad, 2012) (Københavns kommune, 2012) When comparing these statistics we see that Reykjavík is not a very dense city on an international scale.

Figure 1-1 shows the population and boundaries of the ten neighborhoods existing within the city of Reykjavík, with the part called Miðborg representing the city center area.



Figure 1-1 The neighborhoods in Reykjavík (Reykjavíkurborg a)

The city's northern location does however not dictate its climate since the city is located at the coast and therefore tempered by the Gulf Stream. When comparing the city's climate conditions to those of Copenhagen and Stockholm, as seen in Table 1-1 and Table 1-2 below, the results show that the temperature is very similar in the three cities during the winter months, with the minimum temperature a bit below zero degrees during December through March in all cities (with slightly lower temperatures in Stockholm) and the maximum temperature similar in the three cities, lingering a bit above zero during these winter months. However, there are relatively higher minimum and maximum temperatures during the summer season, in May through October. Summers last longer and are warmer in both Stockholm and in Copenhagen, compared to Reykjavík.

	Reykjavík	Stockholm	Copenhagen
	C°	C°	C°
January	-2	-5	-2
February	-2	-5	-3
March	-1	-4	-1
April	1	1	3
May	4	6	8
June	7	11	11
July	9	14	14
August	8	13	14
September	6	9	11
October	3	5	7
November	-	1	3
December	-2	-2	1

Table 1-1 Average minimum temperature (BBC, 2011)

	Reykjavík	Stockholm	Copenhagen
	C°	C°	C°
January	2	-1	2
February	3	-1	2
March	4	3	5
April	6	8	10
May	10	14	16
June	12	19	19
July	14	22	22
August	14	20	21
September	11	15	18
October	7	9	12
November	4	5	7
December	2	2	4

Table 1-2 Average maximum temperature (BBC, 2011)

In 2011 number of days with measured precipitation above 1.0 mm in Reykjavík was 174, which is higher than the average of 148 days per year. (Veðurstofa Íslands-Icelandic Met Office, 2012) However, according to the BBC Weather center, which calculates wet days as days when precipitation is more than 0.1 mm, the numbers are higher as seen in Table 1-3, with 213 wet days in Reykjavík on average per year. The corresponding number for Stockholm is 164 wet days per year on average and in Copenhagen there are 171 wet days per year on average. (BBC, 2011)

	Reykjavík	Stockholm	Copenhagen
	days	days	days
January	20	16	17
February	17	14	13
March	18	10	12
April	18	11	13
May	16	11	11
June	15	13	13
July	15	13	14
August	16	14	14
September	19	14	15
October	21	15	16
November	18	16	16
December	20	17	17

Table 1-3 Average wet days (precipitation of +0.1 mm)

	Reykjavík	Stockholm	Copenhagen
	mm	mm	mm
January	89	43	49
February	64	20	39
March	62	25	32
April	56	31	38
May	42	34	43
June	42	45	47
July	50	61	71
August	56	76	66
September	67	60	62
October	94	48	59
November	78	53	48
December	79	48	49

Table 1-4 Average precipitation (in mm)

Number of days when the ground was covered with snow was 67 in Reykjavík in 2011 which is above the average of 55 days per year. (Veðurstofa Íslands-Icelandic Met Office, 2012) In Stockholm average number of days covered with snow was 75-100 per year and in Copenhagen they are 59 per year on average. (SMHI, 2009)

1.5.2 Parking preconditions

Parking facilities in the city of Reykjavík are mostly free of charge, with a few exceptions within the central city and at official buildings, such as both the hospitals and at parts of the University of Iceland. At the most expensive area the hour costs €1 which means that for 8 hours you would have to pay €8 which is almost equal to the €8.5 fine (€15 if not paid within three days) for illegal parking. (Bílastæðasjóður) People's attitude towards parking fees have been changing over the years, with 75.5 % of those asked in the year 2010 agreed that charged parking is justifiable in the city center, compared to only 49.9 % in 2004. (Capacent Gallup, 2010)

The Icelandic building code stipulates that all dwellings over 80 m² should contain a minimum of two parking spaces within the building premises and dwellings smaller than 80 m² should contain a minimum of one parking space (if not otherwise stated within the detailed land-use plan). (Umhverfisstjórnuneyti) However, according to the current master plan these requirements can be abandoned within the city center, with the installment of no less than one parking space per dwelling. This minimum can be discarded if sufficient parking intended for this dwelling is supplied elsewhere in the vicinity. (Reykjavíkurborg - Skipulags- og byggingasvið, 2008)

1.5.3 Current status of planned improvements to bicycle infrastructure

Currently about 20% of people choose to move around the city by foot or bicycle on a daily basis. The bicycle's modal split was around 3.6% in the year 2010 but might easily be higher if we compare to other cities of similar size, with similar weather conditions. (Capacent Gallup, 2010)

On the map in Figure 1-2 the existing cycle network is illustrated, the yellow lines portray main paths and the green lines portray secondary paths. The parts of the yellow line marked with a black line in the middle indicate separation between walking and cycling traffic.

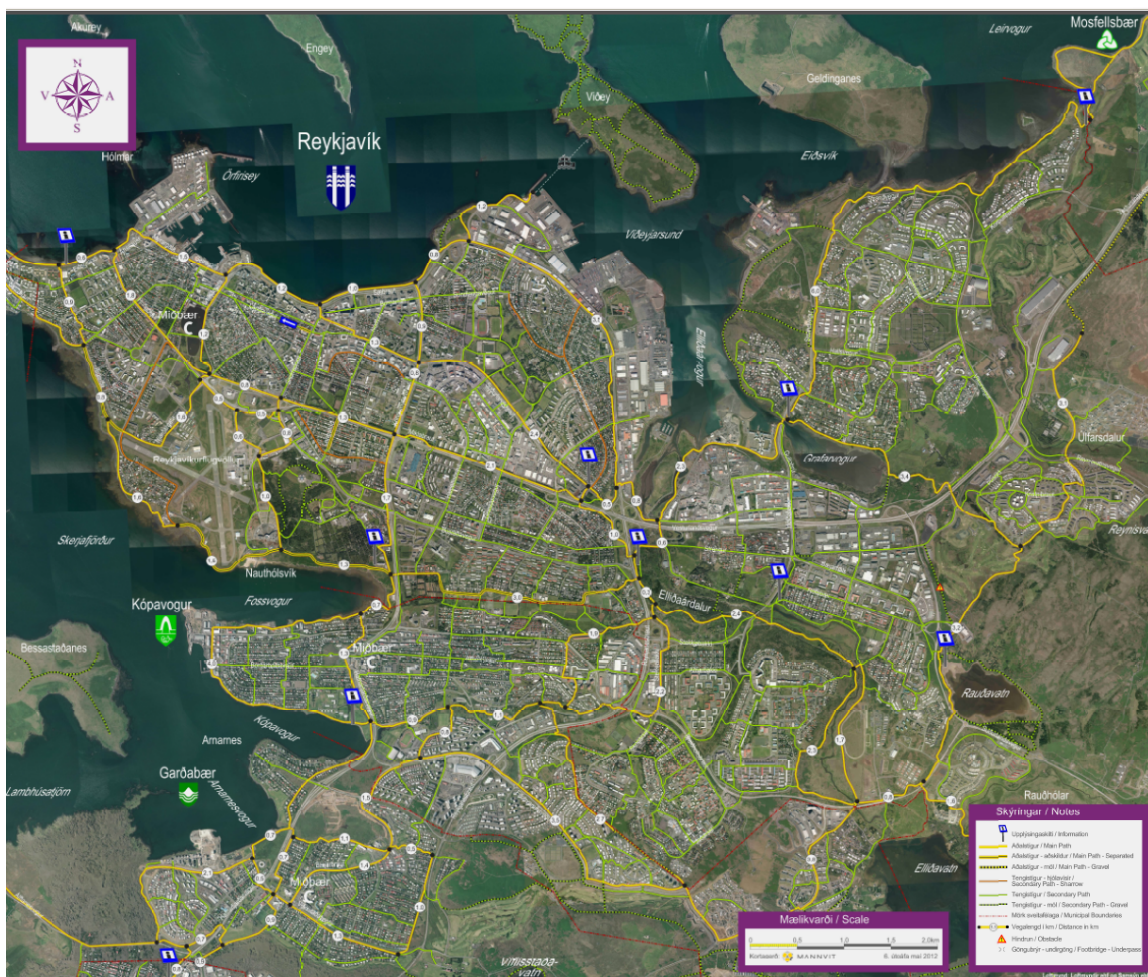


Figure 1-2 Existing cycle network in Reykjavik (Reykjavíkurborg, 2012)

According to a study performed by the division of the Environment at the city of Reykjavík a cyclist can easily cycle five kilometers in 15 minutes. They constructed the fifteen minute map, showing how far a cyclist was able to cycle in fifteen minutes, starting at the city's weighted residential centre and riding on cycle paths and/or walking paths in different directions each time. To the cyclists surprise he was able to cover a large proportion of the city, as seen in Figure 1-3 below.

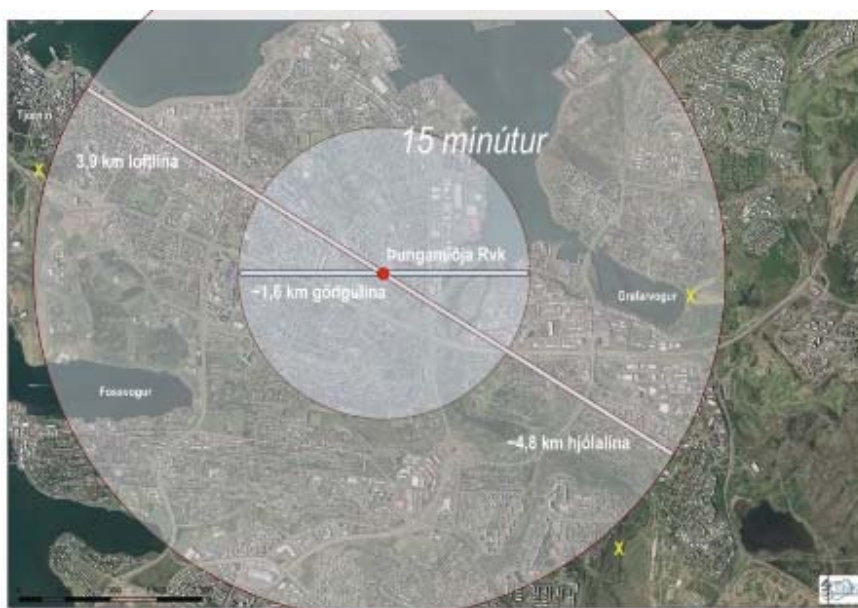


Figure 1-3 The fifteen minute map (Reykjavíkurborg b)

In the year of 2010 the first city plan focusing especially on cycling was published, called *Hjólaborgin Reykjavík*. It consists of ambitious goals to increase the bicycle's modal split and proposed measures to accomplish these goals. Foremost are the city's plans on making more room for those who cycle, with 10 km of bicycle paths to be added every year for the next five years to the now existing 10 kilometers of bicycle paths. The proposal/idea is to set up a major route system along the main roads, to ensure direct routes for cyclists, making it more attractive to cycle. These bicycle paths shall mostly be separated from motorized traffic as well as providing enhanced safety for those who cycle. (Reykjavíkurborg, 2010)

On the map in Figure 1-4 the proposed additions to the existing cycle network are presented with the red lines representing the main paths and the blue lines representing the secondary paths.

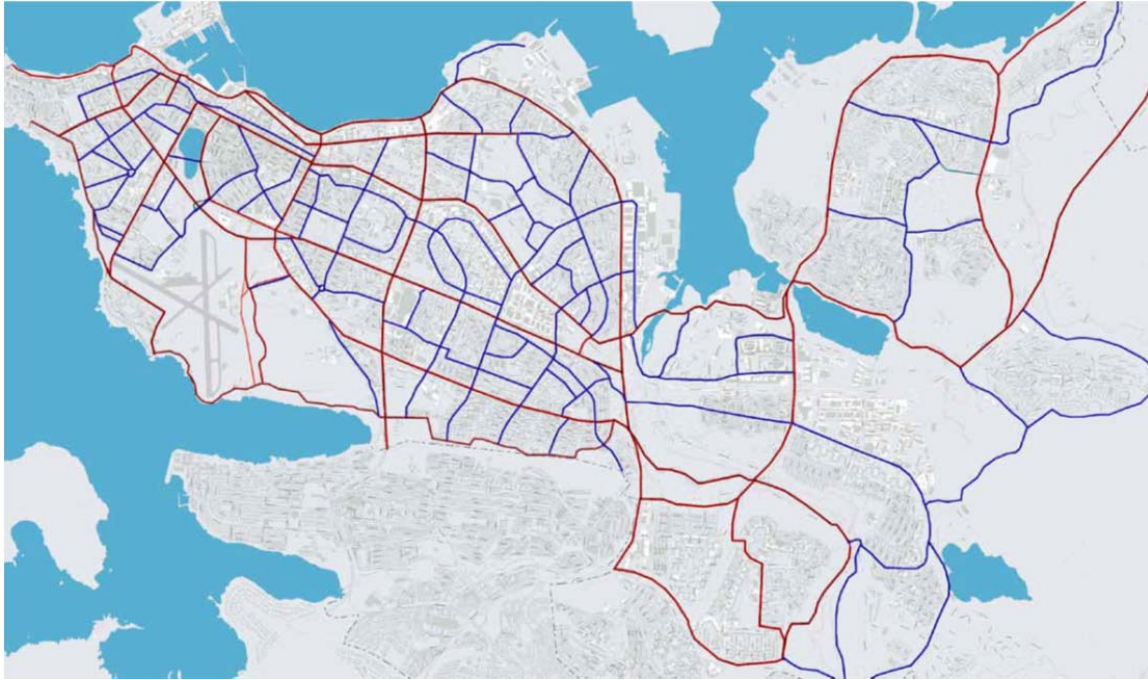


Figure 1-4 Proposed additional cycle paths to the cycle network (Reykjavíkurborg, 2010)

The plan also states that the city of Reykjavík must play a leading role in increasing cycling within the city by setting a good example, encouraging their employees to cycle, in part by making it convenient for them to park their bicycles as well as enabling them to cycle on work related errands. (Reykjavíkurborg, 2010)

One of the city's cycle plans goals is to counteract „urban sprawl“ since long distances are a huge barrier for cycling in general/since short distances are an important factor to increased cycling. Another goal is to keep cycling in mind during traffic planning, especially when designing and constructing new traffic structures. The city will concentrate on making new bicycle paths especially designed for cyclists rather than using existing pavements/sidewalks. (Reykjavíkurborg, 2010)

A more detailed plan of actions include the following goals, within the city center a dense cycle network will be setup to fulfill the requirements that within a 2 km radius there is no more than 500 meters to the nearest cycle path and that within a 4 km radius there is no more than 750 meters to the nearest cycle path. (Reykjavíkurborg, 2010)

Another focus is on how to increase the collaborative use of public transportation and cycling. Today cyclists are allowed to take their bicycle on the bus, if there is room. An important factor to consider in this context is bicycle parking at bus stations. (Reykjavíkurborg, 2010)

The importance of counting cyclist is also addressed. It is supposed to give the city important information on future work regarding bicycle planning. (Reykjavíkurborg, 2010)

The city's cycle plans main objective is to make Reykjavík a more bicycle friendly city, with better and more bicycle paths and more consideration for those who use bicycles as transportation within city planning. The plan is mostly directed at the design, building and improvement of bicycle paths. The idea is that with better design and consideration for cyclists bicycle use should increase. (Reykjavíkurborg, 2010)

The term "safety in numbers" is often referred to in relation to cycling, meaning that with more cyclists on the streets they become more visible and will receive more consideration from motorists. This should result in lower accident rates which in turn results in more people cycling, since cyclists' value security/safety highly when deciding to cycle. (Stangeby, 1997)

In the year 2011 instructions for designing cycle paths in the city of Reykjavík were published for the first time. The instructions are intended to improve and increase collaboration on the quality of solutions designed for cyclists in Reykjavík. It includes a chart intended to be a guideline when deciding which type of solutions should be chosen for particular cycle routes, based on the adjacent/corresponding street's traffic speed and annual average daily traffic. It is though stated that other variables need to be taken into consideration, such as cyclist quantities, actual traffic speed, number of intersections, visibility scope and the number of large/heavy vehicles. The solutions are as follows:

Mixed traffic – Cyclists share the road with motorized traffic.

Cycle lanes – Marked with a thick white line. Only intended for one way bicycle traffic.

Cycle paths – Parallel to the street/road or far away from it. Only for cyclists.

Mixed paths for pedestrians and cyclists – Cyclists share the path with pedestrians and are supposed to give way to them

Paved shoulder – Cyclists cycle on a paved shoulder alongside the road, which is wide enough for cycling

Sharrows– A sign on the street that can substitute cycle lanes or mixed traffic

In the instructions there is also a chapter on the minimum space requirements of cyclists as well as detailed information on how to choose between the above solutions along with

instructions on detailed designs of each solution. The instructions also include detailed information on the paths edification, its trajectory, intersections implementation, traffic lights and special solutions. (EFLA, 2011)

1.5.4 Environmental policy

Currently effective within the city of Reykjavík is the second edition Shaping Reykjavík policy document from 2005, aimed towards establishing a sustainable community in Reykjavík by describing possible means to achieve nine main policy aims by the year 2015. (City of Reykjavík, 2005)

The policy formation of the Shaping Reykjavík policy document takes account of the Local Agenda 21 ideology. It is a conclusion from the world summit of the United Nations in Rio de Janeiro in 1992 that requires all local governments to make a plan on how their municipality can achieve the goal of sustainable development which is most frequently defined by the following definition from the Brundtlandt Report:

*“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”,
(World Commission on Environment and Development (WCED), 1987, p. 43)*

It is also in terms with the Aalborg Commitments, which are designed to strengthen ongoing local sustainability effort within the participating European local governments and to revitalize Local Agenda 21. The Aalborg commitments are a step forward from the previous Aalborg Charter, from agenda to action. Their common vision is that cities should be “inclusive, prosperous, creative and sustainable”, and that they should “provide a good quality of life for all citizens and enable their participation in all aspects of urban life”. They have two main objectives, firstly to raise awareness and highlight the need for local governments in Europe to act in an integrated way to meet the growing challenges of sustainability, and secondly to be a practical and flexible tool for local action and achievements. They consist of ten main commitments, including one about governance, which aims at energizing decision-making processes through increased participatory democracy, along with the commitment about natural common goods, in which the governments fully assume their responsibility to protect, preserve and ensure equitable access to natural common goods. Another is the commitment of planning and design in which a strategic role for urban planning and design by addressing environmental, social, economic, health and cultural issues for the benefit of all is addressed with yet another commitment being better mobility and less traffic. (Aalborg commitments secretariat)

The general aims of the Shaping Reykjavík policy document are accompanied by principal objectives and means to achieve them. The policy aim “Tread lightly – Transport: safe and

easy travel without polluting the environment” focuses on transportation. (City of Reykjavík, 2005)

The objective targeted at footpaths and cycle paths is that they are

“..[to] be defined as transport routes, and be designed and maintained as such” (City of Reykjavík, 2005, p. 4)

Currently these paths are primarily used for recreational purposes and perceived as such. The means to satisfy this objective include the following:

- to create cycle lanes alongside main roads
- to complete connections between foot- and cycle paths in different communities of the capital area
- organized counting of cyclists
- studies of how residential districts can be made cyclist friendly
- improved access for pedestrians and cyclists to main roads between the north and south areas of the city
- heating of certain foot and cycle paths to prevent ice formation
- improved maintenance of pavements
- the study of street and path lighting in order to reduce light pollution and improve illumination. (City of Reykjavík, 2005)

Other objectives that include cyclists and the cycle network are also presented. Those include the reduction of motor traffic in the city centre while strengthening cycle and pedestrian traffic, for instance with cycle rentals in the city centre. Another objective is to encourage the people of Reykjavík to make environmentally-friendly transport a way of life by the means of giving cycle routes priority and making them a visible option for travelling to work, along with possible grants for cycles, cessation of perquisites for car expenses, and fee charges for parking at public buildings. (City of Reykjavík, 2005)

1.5.5 Transportation policy

In an address of the chairman at that time of the environmental council in Reykjavík, in Reykjavík’s transportation policy document approved in 2006, he talks about today’s society being more aware of the fact that people’s behavior affects the environment and therefore also the living conditions of future generations. Because of this environmental issues have taken up a larger part of social affairs, as well as playing a large role in policy making. Transportation affects the environment both in a negative and a positive way. According to him the city of Reykjavík’s largest environmental issues are due to traffic and transportation. (Reykjavíkurborg - Umhverfissvið, 2006) In the city’s claim to become the most ecological/environmentally sound Northern capital this is a problem that needs to be

solved. In this transportation policy, which is a part of the city's Agenda 21 commitment, the aim is to reduce transportation's negative effects on the society and focus on the positive aspects of transportation, such as health benefits of walking or cycling, increased use of public transportation, encouraging the use of ecological power for transportation as well as increasing traffic safety. With all of this the city becomes more vivid and a nicer place to live in. (Reykjavíkurborg - Umhverfissvið, 2006)

The main goal and purpose stated in the transport policy are to:

“Secure accessible transportation without depleting natural resources, health values and the city's characteristics

Fulfill the various travel needs of the city's inhabitants on an equal opportunity basis

Promote full utilization of the city's transportation system“ (Reykjavíkurborg - Umhverfissvið, 2006, p. 4)

In the policy document the city's visions for transportation in the future are also presented. The first, regarding transportations and the environment is:

“That inhabitants in Reykjavík are aware of the effects of transportation on the environment and choose travel modes with the environment in mind. Walking and cycling are realistic options and the city's transportation system is at full capacity/worked out. Public transportation serves a large role in the day to day life of the citizens and the private car is used more efficiently. Environmentally sound/ecological cars are more common – Reykjavík's environment is under less strain resulting from transportation.”
(Reykjavíkurborg - Umhverfissvið, 2006)

To accomplish this mission the city intends to apply focus on designing walking and cycling networks suited for transportation and maintained as such, as well as improving accessibility for the bicycle, especially around stores and workplaces. Walking and cycling paths shall be constructed so as to minimize distances. Another important factor mentioned is the promotion of an intermixed and denser land use in the city. The city shall also enable its residents to use the bicycle as transportation by defining cycle paths as transportation routes and maintaining them as such and by separating bicycle traffic from pedestrians.
(Reykjavíkurborg - Umhverfissvið, 2006)

The second vision, regarding transportation and health:

“More and more Reykjavík residents choose a travel mode with health benefits in mind. Cyclists and pedestrians are more visible in the traffic environment and parents are no longer afraid of allowing their children to walk to school. Large shares of short trips are

made by foot or by using the bicycle and an acceptable car traffic flow exists around the city.” (Reykjavíkurborg - Umhverfissvið, 2006)

Cycling and walking have positive effects on both mental and physical health. Increased education on the importance of daily exercise and the possibility to link transportation and exercise together by pointing out the benefits of cycling and walking should be performed, as well as increasing the safety of vulnerable bystanders/pedestrians, without endangering their mobility. With these and other actions the city of Reykjavík plans to contribute to a healthier lifestyle for its residents. (Reykjavíkurborg - Umhverfissvið, 2006)

The third and last vision concerns transportation and the city’s characteristics:

“The collaboration of travel modes sustains a vibrant city that bustles with life. Resident’s travel choices are carefully considered based on distance, weather, health and other factors. Noticeable is more equality in Reykjavík’s traffic scene. Cyclists and pedestrians are prominent on the streets and public transportation serves its purpose well. The private car’s role in the city centre has been diminished.” (Reykjavíkurborg - Umhverfissvið, 2006)

A more dense land use and an increased intermix offers more residents the opportunity to walk or cycle to get around in the city. When designing new neighborhoods, as well as when making improvements to older ones, cycling, walking and public transportation shall be part of the planning process. The residents shall be reminded of the bicycle as a travel mode and drivers shall be reminded of the fact that there are people who choose to cycle. Bicycle parking shall be set up all around the city and the equality of all travel modes shall be sustained. A systematic parking policy is a means to an end for a denser city, since parking takes up a lot of space. (Reykjavíkurborg - Umhverfissvið, 2006)

Recent studies show that just about half of the city’s land use is for traffic structures, and 38% of the city is paved. According to a presentation of the revised master plan for Reykjavík, 80% of the city’s public spaces are reserved for car traffic. (Reykjavíkurborg - Skipulags- og byggingasvið, 2012)

In 2012 the city plans on allocating 360 million Icelandic kronas (€2.2 million) towards constructing a cycle path from Elliðarársar, along Suðurlandsbraut and Laugavegur along with 80 million Icelandic kronas (€480 thousand), plus an additional 80 million Icelandic kronas from the National Road administration, towards constructing a walking and cycling bridge over Elliðarársar. (Reykjavíkurborg - Framkvæmda- og eignasvið, 2012)

1.5.6 Master plan policy

In Reykjavík and neighboring communities current master plans/general plans cycle paths are discussed as recreational paths rather than paths for transportation, mainly being used

during the summer. Systematic ways to increase the bicycle's share in travel are minimal. However Reykjavík's master plan is currently under revision. The city of Reykjavík has taken steps towards a more sustainable way of city planning over the last few years by establishing a climate policy, a transportation policy and a city cycle plan. The main goal of the climate policy is to reduce emission of greenhouse gases from transportation by increasing the number of those who walk and cycle up to 30% before the year 2020. A goal to make cycle lanes obligatory when designing major traffic routes is an important contribution as well. In neighboring countries city centers often have either restricted access for cars or implement other actions to reduce car traffic. (Stefánsdóttir & Haraldsdóttir, 2010)

A revised master plan for the city of Reykjavík is currently under construction. The master plan is to be valid from 2010-2030 and intended to substitute the current master plan, valid from 2001-2024 (Reykjavíkurborg - Skipulags- og byggingasvið, 2012) A document containing the vision and inspiration for this revised master plan was presented in March 2012, under the slogan "A city for people". Previous plans of building new suburbs are abandoned and substituted with plans for a more dense land use, aimed at increasing the number of dwellings by 12-15% on average within the older parts of the city. The reinforcement of public transportation, walking and cycling is intended within future city planning. Instead of emphasis on construction volumes and carrying capacity a city where people are prioritized is the main objective. This involves the city's neighborhoods becoming self-sufficient/sustainable and diverse, all having their own center that cater to the daily needs of the inhabitants, enabling them to run their errands by walking or cycling. (Reykjavíkurborg - Skipulags- og byggingasvið, 2012)

Goals that are intended to increase the modal split of those that walk and cycle from 21% up to 30% are presented, by setting up a walking and cycling network that allows people to travel around the city in a safer and more attractive manner, since

"An increased number of cyclists in the city has a good effect on the environment, public health and city life." (Reykjavíkurborg - Skipulags- og byggingasvið, 2012, p. 15)

1.5.7 The two neighborhoods

Breiðholt

Breiðholt, located in the eastern part of Reykjavík, is the largest neighborhood in Reykjavík, with over 20 thousand inhabitants. A large proportion of its residents are foreign citizens or around 10% compared to the average 8% in other neighborhoods in the Reykjavík area. Breiðholt boasts of a cultural center called Gerðuberg and the shopping center Mjódd. (Reykjavíkurborg c)

The neighborhood is divided into three parts, upper and lower Breiðholt and Seljahverfi, with 8.516, 3.847 and 8.200 inhabitants respectively. (Hagstofa Íslands/Statistics Iceland, 2011)

The neighborhood is 5.5 km² of which 25% are open spaces, and the floor area ratio is 44 m² per inhabitant. There are 2.540 job occupations within the area and 55 kilometers of walking- and cycling paths (not including sidewalks along streets). (Reykjavíkurborg c)

Hlíðar

The Hlíðar residential neighborhood is located East of Reykjavík's city centre and has around 9.600 inhabitants. A large proportion of its residents are foreign citizens (just as in Breiðholt) or around 10%. A major road, Miklabraut, which connects Eastern and Western Reykjavík, splits the neighborhood in two. The neighborhood boasts of beautiful green areas in Öskjuhlíð, the Perlan building, Kjarvalsstaðir museum, the beach in Nauthólsvík and the University of Reykjavík. (Reykjavíkurborg d)

The neighborhood covers 3.3 km² of land, of which 36% are open spaces, and the floor area ratio is 44 m², the same as in Breiðholt. There are 7.250 job occupations within the area and 12 kilometers of walking- and cycling paths (not including sidewalks along streets). (Reykjavíkurborg d)

The neighborhood is crossed and surrounded by the most heavily trafficked streets within the city, Miklabraut and Bústaðarvegur respectively, and therefore transportation design is a main focus point in the revised master plan's presentation goals for the Hlíðar area. (Reykjavíkurborg - Skipulags- og byggingasvið, 2012)

1.5.8 Views of the city's residents

When examining a compilation Netspor ehf. (2009) from regional neighborhood meetings held in all of the city's neighborhoods in November and December of 2009, in connection with the construction of a new master plan for the city of Reykjavík, the results showed that the residents wanted walking and cycling traffic to maintain a higher value within city planning, and that the design of transportation structures should represent this. Expectations among the residents were on walking and cycling traffic becoming a larger factor within city planning, which would hopefully result in less space assigned/allocated to motorized traffic. The creation of a thorough/comprehensive/integral strategy for bicycle traffic and the construction of new cycling paths and restoration of existing cycling paths were also mentioned by the residents along with better connections between cycle paths being requested. The possibility to keep cycle paths within the neighborhoods was also mentioned, rather than placing them next to main roads. The need for signs that show the destinations of cycle paths was also addressed by the residents. Other element that contribute to reduced use of the private car, such as elevated parking fees and the harmful

effects of pollution from traffic, were also discussed but with no further elaboration. The importance of the possibility to cycle within the neighborhood as well as to adjacent neighborhoods, along with human values becoming more important in traffic planning were all mentioned by the residents as factors contributing to the quality of life. (Netspor ehf., 2009)

1.5.9 Current modal split

A comprehensive travel survey was carried out in the greater Reykjavík area, during October-December of 2011. The results of the survey are compared to those of a similar survey carried out in 2002. Respondents were asked to document their travel behavior during one day as well as answering questions regarding their overall travel behavior and providing other relevant background information such as age, income, where they live etc. The overall results reveal that 3.8% of people cycle, compared to 0.3% in 2002, 61% drive which is an increase from the 58.2% in 2002, 17% are passengers, 14.9% of the people walk and 4% use public transportation. When respondents were asked what of the following three statements describes them/their child and cycling, 12.4% said they cycle all year round, 48.6% cycle during part of the year, and 39% never cycle. (Capacent Gallup, 2011)

When analyzing what types of people cycle the results show that more men (5%) than women (2%) cycle, young people (under the age of 17) cycle the most as well as students holding jobs being more likely to cycle than people who only do one of the two or neither. Those who live near the central Reykjavík area (along with those who live in the neighboring municipality, Garðabær) cycle more than those who live farther away from the central area. The results are similar amongst all occupations, with a slightly higher amount of persons from low income households cycling than other income groups. Persons without a car at their disposal are more prone to cycling than those who have access to a car. (Capacent Gallup, 2011)

When looking at the results from the two neighborhoods primarily focused on in this thesis, they show that 4.9% of the people living in Hlíðar cycle compared to 2.3% of people living in Breiðholt. A higher percentage, 50%, of people living in Breiðholt state that they never cycle compared to the average result of 39%. In Hlíðar only 34.6% of respondents never cycle, which is lower than the average result. This might result from the fact that Hlíðar is more centrally located within the city. In Hlíðar the cyclists are also more likely to have higher incomes, this might partly be caused by the fact that people who acquire higher incomes are more likely to live in Hlíðar. (Capacent Gallup, 2011)

It is also worth mentioning that 97% of the overall respondents have a driver's license, and 92% of them have a car at their disposal, as well as 44% having two cars in their home.

Another interesting fact is that 54% never use public transportation along with 25% more who only use public transportation once a month or less. (Capacent Gallup, 2011)

1.5.10 SWOT analysis

In order to assess the current situation in Reykjavík as well as each area specifically, and its possibilities when it comes to increasing the bicycle's modal split, a SWOT (Strengths-Weaknesses-Opportunities-Threats) analysis is carried out by the thesis author. The analysis is summarized in Table 1-5 which is followed by further elaboration on each matter.

Reykjavík

<p>STRENGTHS Usually mild weather, except for the last two years where the winters (December – February) have been very cold and there was heavy snow in the winter of 2011-2012 Focus within the municipality on increasing the bicycle's modal split Municipal focus on improving cycling facilities Cycle to work challenge in May</p>	<p>WEAKNESSES The city of Reykjavík reaches over 277 m² (Landmælingar Íslands, 2010) Poor connections between cycle paths The city is designed for car traffic The economic crisis makes it difficult to get funding for new projects Consideration towards cyclist is not common in the current traffic culture Only a small group of people cycle every day Dark during the winter – short days Cycle paths are not cleared of snow as quickly as car lanes</p>
<p>OPPORTUNITIES Application to the ELENA fund has been submitted, with a promise that the whole grant will be used to improve cycling facilities as well as public transportation Many politicians are inclined to increasing cycling among the city's inhabitants Increasing oil prices More environmental awareness More and more companies are implementing transport policies/transportation contracts</p>	<p>THREATS Continued economic recession which involves decreased funding to all government related projects Laws that obligate helmet use for all cyclists</p>

Table 1-5 SWOT analysis

Strengths

Usually mild weather – The mean average heat in Reykjavík was 5,9°C in the year of 2010 and the mean average precipitation was 592 mm (Hagstofa Íslands/Statistics Iceland, 2011) According to a Canadian study (Winters, Friesen, Koehoorn, & Teschke, 2007) climatic characteristics of a city, such as precipitation and freezing temperatures, affect levels of cycling, with fewer people cycling in cities with more days of precipitation or freezing temperatures. (Winters, Friesen, Koehoorn, & Teschke, 2007)

Focus within the municipality on increasing the bicycle's modal split and focus on improving cycling facilities– Since the release of the city's cycle plan in 2010 cyclist and cycle paths are getting much more attention. A large part of municipal funding will go towards improvements and construction of new cycling paths (according to an interview presented later in the thesis, with Pálmi Freyr Randversson working for the city of Reykjavík).

The Cycle to work challenge takes place every year in May. It started in the year of 2003 when it was a one week challenge but now it lasts for three weeks. The challenge strives to promote exercise and team spirit within workplaces and introduce cycling as a healthy, environmental and economical means of transportation. Every year the number of participants in the challenge grows, with more workplaces participating and more total kilometers cycled every year, with 694 workplaces participating last year. Many use this as an opportunity to get started and then continue to cycle to work during the summer months. (Hjólað í vinnuna)

Opportunities

Application for a grant from the ELENA– An application has been submitted to ELENA, which is a joint technical assistance facility established by the European Commission and the European Investment Bank to facilitate the mobilization of funds for investments in sustainable energy at local level. ELENA offers specific support for the implementation of investment programs and projects within EU cities that tackle energy and climate change challenges. The City of Reykjavík's municipality plans on using this funding to empower cycling and public transportation (according to an interview presented later in the thesis, with Dagur B. Eggertsson, working for the city of Reykjavík)

Many politicians are inclined to increasing cycling among the city's inhabitants – Politicians seem to have started to notice the benefits more cycling has on the city and its inhabitants, and therefore they are more positive towards measures that increase cycling (according to an interview presented later in the thesis, with Gísli Marteinn Baldursson, working for the city of Reykjavík)

Increasing oil prices – People are increasingly looking towards transportation that does not require fossil fuels since the prices of these have skyrocketed over the last few years. In Iceland oil prices have increased by 70% since 2008. Since cycling does not require any external fuel (only the energy provided by the cyclist) this is an appealing option for people wanting to cut back their traveling expenses. (mbl.is, 2008)

More environmental awareness – People are becoming more aware of the fact that what we do now can endanger future generations living conditions, especially factors which affect

the environment, such as pollution from traffic. This makes the bicycle an even more attractive travel mode. (Winters, Friesen, Koehoorn, & Teschke, 2007)

More and more companies are implementing transportation grants/contracts –The Reykjavík community offices give their employees access to company cars (often electric or powered by renewable fuel) and bicycles to use on work related errands during their workday, as well as improving bicycle parking and in some cases putting up locker rooms and/or shower facilities for people to change out of wet or sweaty cycling clothes. (Reykjavíkurborg b) Many companies in the Reykjavík area have followed. People tend to be more willing to do something if they benefit from it directly, so when offered a transportation grant/contract, for reducing the use of their private cars, they might be more willing to do so than without the motivation of direct personal gain. (RÚV, 2012)

Weaknesses

The city of Reykjavík reaches over 277 m² (Landmælingar Íslands, 2010) – With the city being this vast cycling is not an option for all of its residents, since those who live in the neighborhoods near the city limits have to travel long distances to reach the city centre.

Poor connections between cycle paths – Some cycle paths are well designed and properly constructed but the connection between them is not always present, the city's current cycle network is not continuous. (According to interviews with cyclists, presented later in the thesis)

The city is currently designed for car traffic – The city seems to have been, until recently, designed with focus on car traffic, therefore the cycle network has not been a priority

The economic crisis makes it difficult to get funding for new projects.

Consideration towards cyclist is not common in the current traffic culture – Cyclist are often considered by drivers to be in the way. This has though been changing over the last few years with an increased number of cyclist cycling on a daily basis, as well as more focus being put on the bicycle as a travel mode, and people therefore realizing it is a real option (According to interviews with cyclists, presented later in the thesis)

Only a small group of people cycle every day – This fact makes cycling abnormal so drivers do not anticipate cyclists (Capacent Gallup, 2011)

Dark during the winter – The shortest day of the year only has 4 hours and 9 minutes of sunlight, this makes the winter months rather dark, which in turn make it harder to cycle where there is not enough lighting. (Sæmundsson, 2008)

Cycle paths are not cleared of snow as quickly as car lanes - Cyclist who use their bicycle as a main travel mode all year round need to be able to rely on the cycle network being passable every day. This past winter (2011-2012) has been of heavy snow and walking and cycle lanes were not always cleared of snow. According to the city's snow removal policy main walking and cycling paths are to be cleared of snow before 7 and 8 o'clock, as main traffic routes. However this has not been the case recently due to limited funding for snow removal. (Verkís, 2010)

Threats

Continued economic recession which involves decreased funding to all government related projects – Improvements to the cycle network rely solely on government funding. It has often been a fact that funding towards improvements of the cycle network has not been a top priority, although this is about to change. (According to an interview with a city official)

Laws that obligate helmet use for all cyclists – According to some cycle planner laws that obligate helmet use tend to make cycling less appealing. (Woudenberg, 2011)

2 Literature study – What makes a good city for cyclists

The purpose of this literature study is to introduce results from research from other countries/cities in order to establish a knowledge basis before embarking on my own research, as well as to compare those to the results of my research of the current condition/circumstances in the city of Reykjavík.

2.1 Attitudes toward cycling in general

This might be the issue that is the hardest to change in order to get people to cycle, at the same time also one of the issues that is the most important to change. According to Stangeby (1997, p. II) “Travel behavior surveys all over the world indicate that access to transportation is the most important factor influencing mode choice” (Stangeby, 1997, p. II) Most people like both walking and cycling, people mention cycling being fun, giving good exercise and being convenient as well as by cycling you get fresh air in your lungs, along with it being easy and cheap and moreover, environmentally friendly. Many people also feel independent and flexible when cycling. The majority of respondents being surveyed in the following mentioned surveys agree that a decrease in the number of people driving cars results in improved preconditions for cycling. (Stangeby, 1997)

When a certain standard of the cycle network/infrastructure is fulfilled the psychological factors become more important when considering why some people cycle while others do not. The three general factors that affect cycling behavior are: individual factors, social factors and physical environment factors. (Eriksson, 2009)

Bicycle use is dependent of many key personal factors, such as age, gender, income and general activity patterns. In some countries such as the USA, cycling is mainly for leisure purposes, meaning that people mainly cycle for the sake of cycling rather than for the sake of getting from point A to point B. In other countries, cycling is just a travel mode to be compared to other available modes. (Rietveld & Daniel, 2004)

In a British survey researchers studied what people felt about different transport modes, basing their evaluation on their current transport mode to and from work. In it they considered both emotional aspects, such as stress, control, freedom, relaxation and tension, as well as instrumental aspects such as comfort, cost, flexibility, predictability, environmental and health aspects. In the survey the bicycle was regarded as positive in regards to cost, environment, health, predictability and stress in comparison to other travel modes, as well as it being perceived as more positive in relation to freedom and tension than for example walking. However, these are not the most valued factors according to the participants of the survey. The least important factors, in regard to trips to and from work, were considered being the environment and health benefits, along with relaxation and tension. Nevertheless, when considering recreational trips the bicycle was also perceived as

positive, especially when compared to public transportation and the private car. (Eriksson, 2009)

In another British survey they discovered that the most common reason for an unpleasant cycling experience turned out to be risk/danger and discomfort, especially due to other road users rather than traffic or bad maintenance of the road. Drivers and those using public transportation in comparison felt that delays were the most important causes for unpleasant experiences, but all travel modes felt that the scenery/nature was among the most pleasant features of the trip. (Eriksson, 2009)

Many studies examine what motivates people to cycle. Amongst the most common reasons is the cyclists' pursuit for better health and the fact that it is a pleasant activity according to a study from the USA and Canada. Other reasons include that it is good for the environment, that it is a quick travel mode as well as it being inexpensive and flexible. The most common obstacles for cycling are bad weather (cold or rain), lack of infrastructure, long distances, hilly paths, it being unsafe (due to traffic or darkness), insufficient road cycle network and high curb stones among other more personal reasons such as lack of facilities at the workplace, lack of time or tiredness. British and American studies show different results when determining the most significant negative factor, with some concluding that bad weather is the primary obstacle while others conclude that this is not the main obstacle, rather it being too much traffic along with lack of cycle paths and safe cycle parking. (Eriksson, 2009) (Stangeby, 1997) The environmental benefits of cycling certainly apply in Reykjavík. In the city of Reykjavík airborne particulate matter (PM10) exceeded the acceptable 24-hour maximum value of $50 \mu\text{g}/\text{m}^3$ twenty times in the year of 2009 (the acceptable number of days where minimum requirements are exceeded in 2012 are 7 days). A research of the origin of the particulate matter proved that 60% of this pollution during wintertime is caused by traffic (especially due to studded tires, since they tear up the asphalt). (Reykjavíkurborg e) More cyclists would reduce traffic, which in turn would improve air quality within the city.

More studies have furthermore shown that physical circumstances do play a large part in whether or not people cycle, such as the climate, weather conditions, geography, topography, bicycle infrastructure and the public transport system to name a few. A Canadian study reveals that rain and cold weather decrease bicycle use, along with vast height differences, low density land use, poor bicycle facilities and more. In other studies researchers have noticed that the physical factors in general are not that important but rather how people perceive the physical factors' condition. (Eriksson, 2009) (Winters et al, 2007) A Swedish study shows that temperature, precipitation and road condition are the most important factors to those who only cycle during the summer, while exercise is the most important factor to those who cycle in the winter. (Bergström & Magnusson, 2003) A

Norwegian study furthermore showed that the fact that cycle routes were not cleared of snow and slippery surface played a larger part than the weather or low temperatures in preventing people from cycling. (Bergström & Magnusson, 2003)

Factors that contribute to the generalized cost of cycling are according to (Rietveld & Daniel, 2004): *Travel time*, which depends on the adequacy of the cycling infrastructure, *Physical needs* such as the quality of the infrastructure, along with weather conditions and topography, *Traffic safety* which concerns the risk of being injured, *Risk of bicycle theft* which may result in one being reluctant to use a bicycle at all, *Monetary cost of bicycle use* and *Personal security* which involves the ease of going out at any time of the day and in any part of a city without having to worry about one's safety. Results of their study of municipal policies in relation to cycling in the Netherlands underline a few of these factors. First, that physical effort, such as slopes and frequent stops, plays a large role in the generalized cost of cycling. Second, that travel time is an important determinant of travel demand. Third, that accident risks are shown to play a role in travel demand (which according to them is an under-researched subject). Finally, that cultural tradition appears to play a role as well. (Rietveld & Daniel, 2004)

The inconvenience of cycling mentioned throughout these studies contradicts with the convenience mentioned at the start of this chapter as a positive aspect of cycling. However this can depend on in which context the respondent is referring to, whether the trip being for recreational purposes which the positive aspects often refer to or as a transport mode which negative aspects/hindrances most commonly are linked to. (Stangeby, 1997)

In some studies the difference between recreational cyclists and those who use the bicycle as transportation is researched, with a British study revealing that the recreational cyclists tend to be older, to travel longer distances to work as well as having the access and the requirements to use a private car (a driver's license). Those who use the bicycle as transportation were more inclined to have a positive attitude to cycling, live close to the city or connecting streets and considering it is easier to cycle than using the car. (Eriksson, 2009) A Canadian study concluded that older adults and women are less likely to cycle for utilitarian purposes than young adults and men, which contrasts with European studies where men and women are equally likely to cycle. (Winters et al, 2007)

When comparing cyclists to non cyclists a British study found that those who do not cycle perceived themselves as not being in a good enough shape to cycle, that they were too lazy to cycle and that there were too many hindrances to cycling. The cyclists felt that the positive aspects of cycling were it being pleasant and a good way to get in shape. Moreover, according to a Swedish study of different types of cyclists, those who cycle during the winter do not have equal access to a private car as the other groups which

consisted of those who cycle during the summer in addition to those who do not cycle at all. The first group also included a larger amount of younger cyclists than the latter two groups. The results of the Swedish study also showed that the three groups have different views of what is important when choosing travel modes. The group of people who cycle during the winter/all year round stating exercise, cost and the environment as important factors as opposed to the group of people who only cycle during the summer stating the temperature, rain and road conditions as the most important factors and those who never cycle mentioning travel time, type of errand and cost as the most important factors along with exercise as the least important factor. The results from this particular study show that those who cycle have a more positive attitude to cycling compared to those who never cycle. (Eriksson, 2009) Additionally the results revealed that improved winter maintenance service levels, especially snow clearing, on cycle routes might possibly increase the number of bicycle trips by 18% (which represent a 6% decrease in car trips). (Bergström & Magnusson, 2003)

In various surveys results show that those who usually drive their car and never cycle to work are the hardest to influence, they have the most resistance to a change in travel modes. Those who are most likely to alter their travel modes are those who already own a bicycle along with students, this perhaps due to their limited finances/financial means. Drivers also tend to mention infrastructural barriers to cycling more often than cyclists. (Stangeby, 1997)

From compiling this chapter it seems that the preconditions in the city of Reykjavík are not very well suited for utilitarian cycling. The city is scattered over a large area which results in cyclist having to cover long distances when cycling between parts of the city, causing prolonged travel times.

The city's climate is wet, with measured precipitation on almost two thirds of the days of the year. Snow covered ground is also an issue and of course the lack of sufficient cycling infrastructure as well. However, temperatures mostly fall above zero.

The city's resident's easy accesses to the private car do not benefit cycling, with nearly all households having access to a private car. As noted at the beginning of the chapter, people's willingness to alter their travel modes tends to rely on their access to other alternatives. However, 61% of the respondents in the travel survey, mentioned in the previous chapter, do cycle, which indicates that they own or have access to a bicycle, which they might possibly be willing to utilize more often.

With relatively low parking fees and large amounts of free parking within the city the generalized cost of driving a car is not that high compared to the bicycle, especially when

comparing travel time and comfort. Car drivers have access to free parking almost everywhere in the city, at their workplaces as well as their homes.

However, the city's forthcoming revised master plan, focusing on a denser city, will certainly be of help in increasing cycling within the city, especially if combined with other measures such as investing in more cycling infrastructure.

2.2 Infrastructure

In order to increase bicycle use measures to improve the bicycling infrastructure are of importance, according to survey results illustrated in the previous chapter. Infrastructural measures directed at getting more people to cycle are for instance improved bicycle networks, construction of more bicycle roads/paths and safer crossings for cyclists. (Stangeby, 1997)

This is in accordance with results from studies where respondents were able to mention what measures were likely to increase their bicycle use, where better bicycle infrastructure and bicycle facilities along with increased safety were most commonly mentioned, followed by less traffic and financial incentives. (Eriksson, 2009)

The most important infrastructural measures mentioned in surveys are more cycling lanes and smoother surface for cyclists. (Stangeby, 1997)

The cycle network is a part of the overall traffic network and should therefore be involved in general traffic planning, meaning that the planning of the cycle network should exist in the overall major plans of a city, they cannot be added afterwards. (Svensson, 2008)

New cycle routes increase a cyclist's safety and accessibility but do not induce a substantial change in modal choice. However, new cycle paths and renovations on existing cycle paths can sometimes result in decreased accident rates among cyclists. (Svensson, 2008)

When focusing on the different types of cycle routes, new walking- and cycle paths generate increased cycle traffic, however researchers claim that it is more a matter of new cycle traffic rather than a change in modal choice. These paths do not affect accident statistics. New cycle tracks have been proven to reduce cycling accidents, and cycle lanes contribute to fewer pedestrian accidents but do not prove to generate an increase of cyclist. (Svensson, 2008)

Currently, particular bicycle infrastructure within the city of Reykjavík is, as stated in chapter 1.5.3, is very limited. Cycling as transportation currently mainly exists on recreational paths (intended for both walking and cycling), on sidewalks and on the street alongside motorized traffic.

More information on the quality of bicycle infrastructure can be found in chapter 3, covering the observational analysis.

2.3 Policies

Government policies aimed at increasing cycling are especially important in a city like Reykjavik, since the climate and topography of the city, as well as the urban sprawl is not in our hands to be changed. According to (Pucher & Buehler, Making Cycling Irresistible:

Lessons from The Netherlands, Denmark and Germany, 2008), government policies are equally important as history, culture, topography and climate. In countries with high cycling volumes, such as The Netherlands, Denmark and Germany, some local city authorities have focused on making their cities people-friendly rather than car friendly. This is done by governing the expansion of the private car and its almost proprietary right to city space, which has been the mainstream in many other countries. A city full of cyclists is a livable and sustainable city. (Pucher & Buehler, Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany, 2008)

A general result found in transportation research is often a combination of push and pull policies. This is also the fact in (Rietveld & Daniel, 2004) research, resulting in two ways to encourage bicycle use, the first to improve the attractiveness of the travel mode by reducing its generalized costs and the second to make competing modes more expensive. (Rietveld & Daniel, 2004)

One factor most cities with successful bicycle planning have in common is that the cycling network allows cyclists to cover almost every trip on separate bicycle paths and lanes or on lightly travelled, traffic-calmed residential streets. Many of these cities allow cyclist short cuts through cul-de-sacs (dead end streets for cars) and right hand turns at intersections that make it even easier (and safer) to cycle. The fact that these cities have separate cycling facilities is though probably the most important factor in Dutch, Danish and German policies to make cycling a safe and attractive option. In these countries many cities have large car free zones within the city centre. In combination with traffic calming of residential streets this makes it inconvenient for cars to travel through the city centre to get to the other side of the city, forcing cars to use other routes around the city center, therefore decreasing congestion, pollution and safety issues within these city centers. (Pucher & Buehler, Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany, 2008)

The „Home Zone“ or „woonerf“ is a Dutch form of traffic calming, in which cars are required to travel at walking speed on some residential streets, and cyclists, pedestrians and playing children have the same rights as cars to use the streets. (Pucher & Buehler, Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany, 2008)

The main focus of Amsterdam's transport policy are non-motorized modes of transport, even though the city's main transport policy goal is to increase accessibility by all modes. With a bicycle policy plan "Choosing for cyclist: 2007-2010" the city focused on addressing cyclists main concerns, which were bicycle theft, shortage of safe bicycle parking facilities, traffic safety and relatively long waiting times at signalized intersections, and taking measures to resolve these with great subsidy from both city funds and other

levels of governmental funding. (Pucher & Buehler, *At the Frontiers of Cycling: Policy Innovations in the Netherlands, Denmark, and Germany*, 2007)

Another Dutch city, Groningen is the most bicycle oriented city in the Netherlands with the highest bicycle share of local trips, around 40%, of all Dutch cities. Its flat terrain facilitates cycling as well as the city's large proportion of students, but perhaps the most important factor in the growth of cycling as a means of daily transport is the city's compact land use and its car restrictive measures, which is a result of the city's strict sustainable land use and transport policies which limit low density development. In the year 2005, 78% of its residents and 90% of its jobs were located within a 3 km radius of the city center. The city's main transportation goal is to sustain cycling as a safe, convenient and practical means of local travel, making it a realistic and more sustainable alternative to the private car. This is to be upheld with the former mentioned land use and transportation policies as well as with high quality cycling infrastructure. (Pucher & Buehler, *At the Frontiers of Cycling: Policy Innovations in the Netherlands, Denmark, and Germany*, 2007)

Other political methods aimed at increased cycling are to make city centers free of cars, priorities for cyclists on crossings and various measures to reduce traffic, such as increased gasoline prices, fees for parking spaces etc. (Pucher & Buehler, *At the Frontiers of Cycling: Policy Innovations in the Netherlands, Denmark, and Germany*, 2007)

2.4 Measures to increase cycling

The Netherlands, Germany and Denmark have the largest numbers of cyclists, both when considering the bicycle modal split, and kilometers traveled. The Netherlands have the highest percentage of trips made by bicycle, 27% in 2005, in Denmark 18% of trips were made by bicycle in 2002 and in Germany 10% of trips were made by bicycle in 2001. Therefore it makes sense to look at these countries methods to increase and sustain a high level of cycling, even among almost all age groups, when figuring out a way to increase cycling in other countries. (Pucher & Buehler, Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany, 2008)

The city of Odense, Denmark, with 194 000 inhabitants, has 500 km of bike paths and lanes. It reaches over an area of 304 km². (Kommunefakta, 2008-2010) It was designated as Denmark's official National Bicycling City in 1999 and has the highest bicycle modal share of all Danish cities, cycling accounts for about a quarter of all trips. Over a 3 year period, from 1999 to 2002 there was a 20% increase in total bike trips, a result of a number of federally supported pro-bike programs. With 25 permanent counting stations frequent monitoring of cycling travel demand is available, which facilitates bicycle planning. (Pucher & Buehler, At the Frontiers of Cycling: Policy Innovations in the Netherlands, Denmark, and Germany, 2007)

In Odense they have also set up a so called "Green wave" for cyclists that are bright green lights on small bollards along highly traveled cycle paths which pulsate in a wave-like forward motion to guide cyclists to the next green traffic signal at 20 km/h, allowing the cyclist to get green traffic signals at all intersection given that they keep pace with the green wave. (Pucher & Buehler, Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany, 2008)

Safe and convenient cycling facilities may be one of the most important factors to promote cycling, but other factors are also important. Programs to encourage people to cycle (and cycle more often) also play a large role. In the three countries mentioned above, many cities have programs aimed at stimulating interest and enthusiasm for cycling. These range from minor campaigns focused on special target groups such as the „Cycling Ducky“ in Odense, which distributes candy, balloons and other gifts to children learning to cycle, to more substantial projects such as bicycling competitions among workplaces, bicycling festivals and car-free days that promote the health- and environmental advantages to cycling. Other projects such as better access to bicycles with for instance City Bikes parked throughout the city, as in Copenhagen, easy and inexpensive bike rentals at train stations and throughout the city and company bikes available for employees to use to run errands during the workday, all encourage people to cycle more, along with good access to bike trip planning, with bicycling websites and comprehensive bicycle maps for cities. The participation of the

public in bicycle planning is also an important factor, such as regular surveys of cyclists to assess their satisfaction with cycling facilities and programs and bike councils that provide a platform for opinion exchange among all concerned, cyclists and bicycle planners alike. (Pucher & Buehler, Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany, 2008)

In Copenhagen they carry out a survey of cyclists every other year, where the cyclists themselves evaluate the actual performance of the cycle network in the city and are allowed to offer suggestions for the improvement of it. This allows bicycle planners to evaluate and track progress over time. The survey also includes information on cycling levels, trip purpose and cyclists characteristics which can be used to complement other travel surveys and countings of cyclists. (Pucher & Buehler, At the Frontiers of Cycling: Policy Innovations in the Netherlands, Denmark, and Germany, 2007)

In these three countries there is also extensive training incorporated in the school curriculum, where most children complete a course in safe and effective cycling techniques by the fourth grade, with both lessons within the classroom as well as “on the road”. (Pucher & Buehler, Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany, 2008)

In Detmond, Germany, those who cycle increased from 5% to 14% by various campaigns in one year. In comparison, 6 years of infrastructural measures only resulted in 2% increase of those who cycle. Campaigns containing incentives, such as for instance a new bicycle, often produce a substantial change in travel modes, but the long term effects are often relatively small. (Svensson, 2008) This shows that more effort should be put into campaigning in order to increase the number of cyclist.

The WALCYNG project was a research project with many participating European countries with focus on substituting shorter car trips by WALking and CycliNG, and to make these trips safer.

“The purpose of WALCYNG is to identify conditions and measures that may be used to encourage the replacement of short car trips with pedestrian and bicycle traffic. ... The goal is to show how short car trips could be replaced by walking and cycling with the help of marketing instruments.” (Stangeby, 1997)

The project assumes that in order to reduce the use of the private car, cycling must be promoted. It involves attitude surveys, covering everything from how the respondents actually do travel to their opinions on how they might be inclined to choose other modes of transportation. The project applies a marketing model, which is formalized into the following four parts, featuring information-, product and distribution-, incentive and

pricing- and communication policy. The project produced an evaluation scheme called the Walcyng Quality Scheme (WQS), to be used to obtain and evaluate information about preconditions for walcyng in a particular area. (Hydén et al, 1999)

In the city of Reykjavík the cycle to work challenge in May plays a large role in getting people to start cycling. There is an increase in participants every year and many cyclists continue to cycle throughout the summer months. (Hjólað í vinnuna)

Some companies are becoming more aware of the importance of giving back to the community they exist in. One of their methods is to encourage their employees to use more sustainable transportation and therefore have their own transportation policy and even a transportation grant, which subsidizes employees for choosing not to use a private car on their way to and from work. The city of Reykjavík's community offices provide access to company cars (often electric or powered by renewable fuel) and bicycles to use on work related errands. They also supply bicycle parking at their premises as well as shower facilities. Other companies in the Reykjavík area have followed suit. (Landssamtök hjólréiðamanna - The national cyclist association, 2011)

3 Observational analysis

To assess the current infrastructure on the two studied routes much needs to be taken into account. An attractive cycling environment, according to a survey in Göteborg, can be described with directness/swiftness, safety, contiguity/coherence and comfort. (Nilsson, 2003) This corresponds with other literature such as the GCM Handbok (Sveriges Kommuner och Landsting, Trafikverket, 2010) where the cyclist's need for accessibility, ease of use, safety, security and an attractive environment are mentioned as significant factors in the design of cycle routes as well as in CROW (2007) where the five main requirements mentioned when designing for bicycle traffic are accessibility, directness, safety, comfort and attractiveness (Svensson et al., 2011)

In order to establish a well built cycle network many key factors need to be in place. The cyclist's own experience with the route he chooses is important, and determines his decision to choose that route again. According to Nilsson (2003) cyclists feel that signs on a well connected cycle network increase their mobility, along with a smooth surface and routes where cyclists do not experience delays at intersections. Physical characteristics on cycle paths such as cavities, placement of poles and turning radius are also a determinant on the cycle path's quality. Steep hills can affect the attractiveness of a cycle route as well as paths that are considered unsafe. Cycle paths/cycle ways are considered safest, cycle lanes come second but cycle routes where cyclist have to get involved in car traffic are considered to be least safe, even if this is not always the case when looking at accident risk statistics. The environment surrounding the cycle path is also a factor when deciding on which path to choose, with green areas and historical buildings contributing to an attractive cycle path and traffic noise and pollution affecting it negatively along with areas with poor lighting and too much shrubbery which make the cyclist unsafe and scared of crime (although this happens mainly during the night). (Nilsson, 2003)

Safety is a primary factor when designing intersections since half of all severe injuries happen there. According to Svensson et al. (2011) there are ways of enhanced safety at intersections that include increased visibility, the use of roundabouts and the lowering of speed to that of cycling (20-30 km/h). In Sweden and Stockholm there have been set up different types of paving and color in order to bring attention to what traffic laws apply and add to the separation between travel modes. (Svensson et al., 2011)

According to VGU there are three main criteria for a good cycle/pedestrian crossing:

Good traffic safety – Pedestrians and cyclist should be able to cross the street without risking death or severe injury due to a collision

Good accessibility – The yield time should be short and the crossing should be easy and comfortable to use. Risky behavior should be suppressed and the path should be good

Good clarity/simplicity – Pedestrians and drivers should be able to quickly notice where a crossing is located and what rules apply there. (Vägverket, 2004)

A pedestrian cycle crossing (without signals) is most safely located in direct association with the road or at most one meter from the road. This ensures a good co-operation between cyclists and drivers since they are visible to one another. If this is not possible the second best solution is to locate the crossing 6 meters away from the parallel curb. (Vägverket, 2004)

In order to achieve a secure traffic environment, it is important that cyclists slow down when they get close to possibly hazardous areas. Low speed allows the cyclist/driver to be more aware of what is happening around him and therefore being able to react to prevent accidents, as well as reducing the risk of severe injuries. The speed is relevant both in cases for drivers and cyclists when looking at security aspects. (Nilsson, 2003)

Accident statistics from the year 2010 show that no cyclist died in an accident in Iceland that year nor has any cyclist died in an accident since the year 1996. Nevertheless 21 cyclists were severely injured and 61 cyclists suffered minor/slight injuries in traffic related accidents. Of the cyclists who were severely injured 15 were hit by a car while five cyclist's injuries were caused by a fall. These statistics solely include accidents that are reported to the police hence not all single cyclist collisions are included. The majority of cyclists who were injured were 36 children at the age of 7-14, but 28 cyclists injured were at the age of 25-64. (Gunnarsson et al., 2011)

According to more thorough statistics, collected from the Road Traffic Directorate, accidents where cyclists were hit by cars were divided as follows; three cyclists were hit when cycling on a sidewalk, two cyclists were hit when crossing crosswalks, one cyclist was hit when cycling on a parking lot and nine cyclist were hit when cycling on the street, with five of those being hit when they were crossing the street (however in three of the cases the cyclist was to blame). (Umferðarstofa/The Road Traffic Directorate, 2012)

Icelandic traffic laws (Article 39, paragraph 1 of the Traffic Act no. 50/1987) include a section that concern cyclists. They state among other things that:

*“...A cyclist should keep to the right on the furthestmost right lane of the street.
A cyclist, approaching an intersection intending to go straight or turn left, can*

continue to keep to the right on the road. If he plans on turning left he should continue through the intersection and only turn, when he can without inconvenience and without disturbance to traffic.

Cycling on sidewalks and walking paths is allowed, if it does not cause any risk or inconvenience to pedestrians. Cyclists cycling on sidewalks should yield/give way for pedestrians...” (Lagasafn, 2012)

When observing these traffic laws which are currently in place cyclist do not have their own space to cycle on, they are allowed to cycle on the streets but only on the drivers conditions and they are allowed to cycle on the sidewalks but only as secondary travelers since they are not supposed to be in the way for pedestrians.

The TRAST guide (Sveriges Kommuner och Landsting et al., 2007) divides the cycle network into two parts, the main cycle network and the local cycle network. The main cycle network is intended to serve those who are cycling longer distances and should mainly consist of separate cycle paths. The local cycle network serves those who cycle shorter distances within parts of the city, and should include both cycle paths and smaller streets that cyclists share with car drivers and create a consistent network. (Sveriges Kommuner och Landsting et al., 2007)

The TRAST guide states that the main cycle network should be at least as direct as the car network/streets and that detours of more than 25% should not occur. It should be easy to navigate to important destinations within the network and it should allow cyclists to maintain their preferred speed and allow for cyclist to have a choice about their preferred route. The main cycle network should have its own lighting. Intersections with car traffic should prioritize cyclists and should be formed to minimize the hindrance of car traffic to cycle traffic. The main cycle network should accommodate peak hour traffic without difficulty, allow a travelling speed of 30 km/h and have good comfort. Steep hills and sharp turns should be avoided and the pavement should be smooth and without obstacles (such as bumps etc.). Cycle parking should be available within walking distance of important locations and should allow the bicycle's frame to be locked onto something solid, be protected from the elements with a roof, as well as being well lit and esthetic. (Sveriges Kommuner och Landsting et al., 2007)

The local cycle network does not need to be as detailed as the main cycle network according to the TRAST guide, it should be connected to the main cycle network but consist of more scenic routes. It should mainly consist of separate cycle paths but can be combined with local streets. Lighting can be sufficed with the existing street lighting and the travelling speed should be 15-20 km/h. There should be alternatives to steep hills and the pavement should preferably be smooth. Bicycle parking, onto which you should be able

to lock the bicycle's frame, should be available at important locations such as schools, shops and bus stations. (Sveriges Kommuner och Landsting et al., 2007)

A direct cycle network is intended not to deviate more from the direct route than necessary. A cycle network's continuity is intended as a coherent and unbroken path with a high standard. Good way finding qualities describe a cycle network that is easy to understand and has coherent signage and different landmarks to make it easier for the user to orientate himself. A flexible cycle network offers alternative routes for various errands. A cycle networks reliability depends on whether or not you can count on it always working, with no hindrances, such as the trip's time of day or weather conditions. This requires winter service such as the clearing of snow, good lighting and secure cycle parking. (Sveriges Kommuner och Landsting et al., 2007)

In order for the bicycle to be a realistic alternative to the private car it needs to uphold a certain time share compared to the car. This travel time ratio weighs the time it takes to drive from a certain destination to another destination (including the time it takes to walk to and from parking) against the time it takes to cycle between the two destinations (at a speed of 15-20 km/h depending on the number of intersections, the incline of the path and who's cycling). This travel time ratio needs to be around 1,5 and never higher than 2,0, as seen in Table 3-1 where travel time ratio is categorized into three colors with green being the best and red the worst. The acceptable travel time ratio for a main cycle network is lower than the acceptable ratio for a local cycle network. (Sveriges Kommuner och Landsting et al. 2007)

Type of network	Travel time ratio bicycle/car		
	> 2,0	1,5 - 2,0	< 1,5
Main cycle network	red	Yellow	green
Local cycle network	yellow	Green	green

Table 3-1 The cycle network's quality in accordance with the bicycles compatibility towards the car (Sveriges Kommuner och Landsting et al., 2007, p. 210 (translated by author))

To evaluate the directness of a path the length of a cycle route can be compared to the aerial distance of the same start and finish destination, which gives a specific route directness ratio which should preferably be under 1,25 as seen in Table 3-2. This is however highly dependent on the length of the route being evaluated, the shorter the distance the more impact a detour will have. (Sveriges Kommuner och Landsting et al., 2007)

Type of network	Route directness ratio		
	> 1,5	1,25 - 1,5	< 1,25
Main cycle network	red	yellow	green
Local cycle network	red	yellow	green

Table 3-2 The cycle network's quality in accordance with route directness (Sveriges Kommuner och Landsting et al., 2007, p. 210 (translated by author))

The way finding quality of a cycle network is hard to measure but an effective method is to evaluate quality of the signage, as shown in Table 3-3. (Sveriges Kommuner och Landsting et al., 2007)

Type of network	No consistent signage	Signpost at important junctions	Coherent, clear and consistent signage
Main cycle network	red	yellow	green
Local cycle network	yellow	green	green

Table 3-3 The cycle networks quality in accordance with way finding (Sveriges Kommuner och Landsting et al., 2007, p. 210 (translated by author))

To evaluate the cycle networks performance during wintertime, winter maintenance and the clearing of snow needs to be observed and categorized as seen in Table 3-4 below. (Sveriges Kommuner och Landsting et al., 2007)

Type of network	Clearing of snow and precautions to prevent slipperiness start immediately after they have been carried out in the adjacent street network	Clearing of snow and precautions to prevent slipperiness start at the same time as in the adjacent street network	Clearing of snow and precautions to prevent slipperiness start before they are carried out in the adjacent street network
Main cycle network	red	yellow	green
Local cycle network	red	green	green

Table 3-4 The cycle networks quality in accordance with its operation during wintertime (Sveriges Kommuner och Landsting et al., 2007, p. 210 (translated by author))

One main route from each neighborhood is studied specifically. Firstly the cycle path from Neðra-Breiðholt through Elliðarárdalur towards Grensásvegur, Skeifan (approx. 3.75 km) with a starting point at Mjóddin and a destination at Mannvit's headquarters on Grensásvegur 1. Secondly the cycle path that is located on each side of Miklabraut, from Hlíðar towards Grensásvegur, Skeifan (approx. 2.10 km) with a starting point in Hlíðar and the same destination at Mannvit's headquarters.

A checklist was compiled out of the factors accumulated in the literature study, along with recurring factors mentioned during the interviews with the cyclists that seemed important, and used to compare the two routes in a more detailed manner and get a better and more impartial view on the existing cycle infrastructure.

Checklist for observational analysis:

Cycle paths/Walking paths/Recreational paths:

Pavement type (gravel, concrete, tiles), is the path smooth and without damages?
Separation from pedestrians: Separated - type of separation/Not separated?
Design of intersections with motorized traffic (type, assessment of safety, assessment of level of service)?

How direct is the path in terms of distance: Route directness ratio
How direct is the path regarding travel time: Travel time ratio
Signs to indicate destination of path?
Lighting at night, good sight (bushes and other obstacles)?
Width?
Shelter from weather elements?

Cycle lanes:

How are they separated from motorized traffic (e.g. are they at the same level as the street or at a higher level)?
How are intersections constructed (e.g. box for waiting cyclists, intertwined with car traffic) safety and level of service, traffic lights – are cyclists prioritized? Are there special lights for cyclists?
Are they wide enough for a faster moving cyclist to pass a slower moving cyclist?
Condition of pavement (are they stationed in the gutter, are they smooth)?

Other:

Is there cycle parking near destinations within the neighborhood and at destinations?

3.1 Route 1 –Breiðholt to Skeifan

This route carries on all the way from Núpabakki, Breiðholt to Grensásvegur, Skeifan, see Figure 3-1 where the route is marked in red. The route can be divided into four parts, described in detail later in this chapter. The route was analyzed mid-day in March 2012, there was hardly any bicycle traffic and few pedestrians. The weather was mild without much wind but there was rain during parts of the day. All photographs in this chapter are taken by the author.

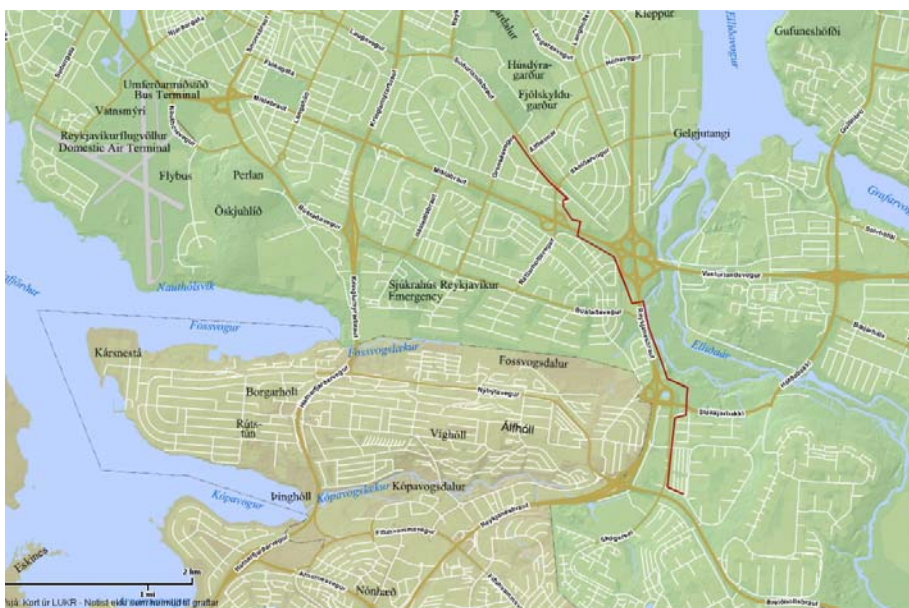


Figure 3-1 Overview of the route (Borgarvefsjá - Reykjavíkurborg)

The route was chosen by the author, as the most direct route allowing the cyclist to travel on special walking/cycling infrastructure. The whole route is 4.20 kilometers long, with a total ascent of 50 meters and a total descent of 92 meters. It took 16:52 minutes to cycle the route on an average speed of 14.9 km/h. The aerial distance of the route is 3.79 kilometers (according to Google Earth) which gives a route directness ratio of 1.11 which is below the preferred maximum of 1.25. The trip by car takes 9:22 minutes which results in a travel time ratio of 1.80 which is a bit higher than the preferred 1.5. There is no signage on the route to indicate the routes destination, apart from a couple of cycle signs to demonstrate that this is a cycle route, and a map of the cycle network in Reykjavík.

The first part of the route is a sidewalk that conforms to typical sidewalks in Reykjavík, a paved wide path at the side of the road with a green section used to separate it from motorized traffic, intended for both pedestrians and cyclists, with no separation between cyclists and pedestrians. It has a smooth surface which facilitates cycling, and crosses side streets without any special crosswalks. Curbs are however curved to facilitate cycling (see Figure 3-2)



Figure 3-2 Ósabakki, Breiðholt

The path is served by street lighting when located along the main street which makes it more secure when it is dark out, but when it is not next to a street there is special lighting. The path is direct, except for when it crosses a main street, there you have to take a sharp turn (see Figure 3-3) before crossing the street over an elevated crosswalk controlled by traffic lights. In order to avoid accidents where cyclist miss this sharp turn and cycle out onto the street barricade fences have been installed at the end of the path. This can however also be a positive thing, since this forces cyclists to slow down when closing in on the intersection, and therefore become more observant on oncoming traffic. The crosswalk is set with red paving stone, (see Figure 3-4) to visually separate travel modes and increase awareness.



Figure 3-3 Intersection Álfabakki/Stekkjarkakki



Figure 3-4 Intersection Álfabakki/Stekkjarkakki

Before arriving at the second part of the route the cyclist needs to cross a street with no special pedestrian/cyclist crossing (see Figure 3-5). With no crossing cyclists and pedestrians alike become more vulnerable and subject to collisions, since drivers might have a hard time noticing them, without the warning of exposed passersby. Even though this is a lightly trafficked street only serving as a connection between two exits from a neighborhood, this does not conform to the VGU (Vägverket, 2004) criteria for a good cycle/pedestrian crossing, it does not uphold a good standard for any of the three aspects; traffic safety, accessibility nor clarity/simplicity.



Figure 3-5 Grænistekkur

The second part of the route is a scenic walking/cycling path that runs through the open area in Elliðarárdalur, which is a beautiful open area within the city limits. The valley takes its name from the Elliðaá river that runs through it and is a popular recreational area for runners, cyclists and outdoor enthusiasts.

The route is laid with a wide pavement with overhead lighting and no separation between pedestrians and cyclist (however the two travel modes are separated in other parts of the Elliðarárdalur area). Before entering the Elliðarárdalur area there is an underpass under a major road, the underpass is wide and has good lighting and should therefore make cyclist

feel more secure during day and night. This part of the route however is not near residential areas and might therefore be considered unsafe during nighttime.

When entering this second part of the route an elevation of 30 meters must be descended/ascended. There is a choice of two alternative paths to overcome this incline, one more flat than the other, which allows each cyclist to choose which one they prefer. On one part of the path there is a slight pitted section, otherwise the path is rather smooth. There is however a lot of gravel on the path, most likely due to the fact that streets and paths had at the time yet to be cleaned after winter, which can be hazardous for cyclists. There are signs that indicate separation between cyclists and pedestrians, even though there are no markings on the ground on this part of the Elliðarárdalur area. At one point of the path there is a map of the surrounding walking/cycling paths along with cycle parking consisting of poles to lock the cycle frame onto.

When continuing onto the third part of the route there is an underpass under a major road, the underpass is narrow but has sufficient lighting. To access the underpass a sharp turn needs to be made at both sides. On one part of the path, there is a slight pitted section which might cause cyclist accidents. There is some shrubbery and trees on parts of this part of the route but at the time of the analysis there were no leaves on the trees. However, some of the trees are large and close to the path and do probably obstruct line of sight. This part of the route runs along two highly trafficked major roads, Reykjanesbraut and Miklabraut. This causes both noise and particulate matter pollution to cyclists which contributes to an unattractive cycling environment (as discussed in the beginning of this chapter). There is a walking/cycling bridge crossing Miklabraut with lightly elevated slopes leading up to it. The ground on the bridge is smooth, entrances are wide and the railing is low as not to hinder line of sight for cyclists.

The fourth part of the route runs along Skeifan, passing one main road with an underpass and another smaller street at traffic signals. The underpass is rather narrow but well lit and has a reasonable incline to enter and exit it. It is in line with the cycle path and does not require a detour. Immediately after passing the underpass a street needs to be crossed at an elevated pedestrian crossing which might cause delays to cyclist during peak hour traffic, see

Figure 3-6



Figure 3-6 Elevated crossing in Skeifan

After the crossing the path continues on along the Skeifan area and crosses another street at traffic lights. On that intersection motorized traffic is prioritized, with cyclists/pedestrians having to wait for two different traffic lights, the first one to cross the street, the other one to cross the exit for traffic turning right off Suðurlandsbraut into the Skeifan area, see Figure 3-7. After this the path continues on to the destination without disruption, separated from the major road, Suðurlandsbraut, with a “green” traffic buffer, see Figure 3-8.



Figure 3-7 Intersection at Fákafen/Suðurlandsbraut



Figure 3-8 Cycle route along Suðurlandsbraut

Overall this route conforms relatively well to the TRAST guide's cycle network guidelines discussed previously in this chapter 3. The route is rather direct without major detours, it mostly allows cyclist to maintain their preferred speed (with a couple of exceptions in relation to underpasses) and, at some parts, to choose their preferred route. There are minimal disruptions due to motorized traffic since nearly all intersections with major roads have special cyclist/pedestrian crossings. The main cycle network part has its own lighting and the pavement is mostly smooth. The local cycle network also meets the TRAST guidelines, it is connected to the main cycle network, the pavement is smooth and it provides sufficient lighting. However, the whole route's main downside is that it does not consist of separate cycle paths.

3.2 Route 2 –Hlíðar to Skeifan

This route carries on all the way from Reykjahlíð, Hlíðar to Grensásvegur, Skeifan, see Figure 3-9 where the route is marked in red. The route can be divided into three parts described thoroughly later in this chapter. The route was analyzed mid-day in March 2012, there was hardly any bicycle traffic and few pedestrians. The weather was mild without much wind but there was rain during parts of the day.

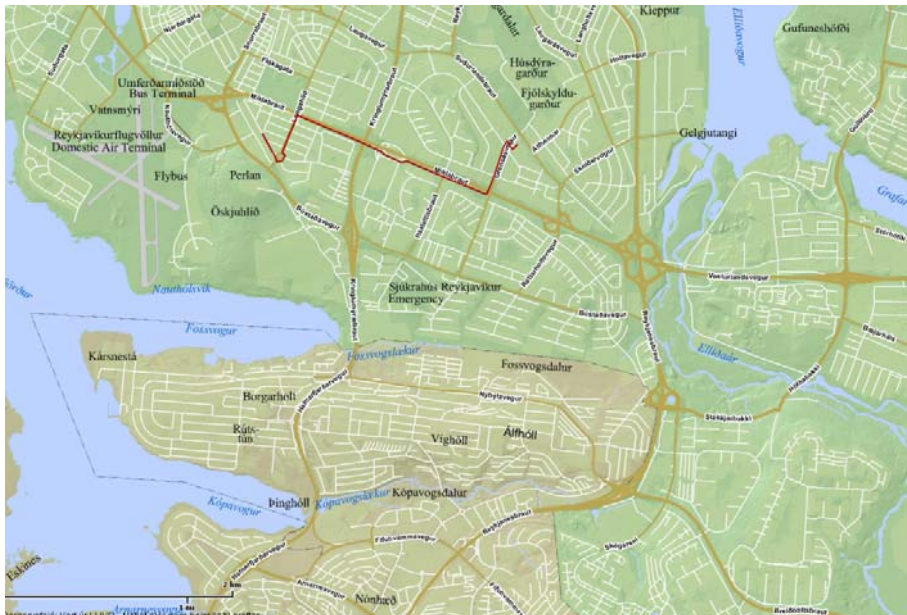


Figure 3-9 Route overview (Borgarvefsjá - Reykjavíkurborg)

The route was chosen by the author, as the most direct route allowing the cyclist to travel on special walking/cycling infrastructure. The whole route is 3.23 kilometers long, with a total ascent of 50 meters and a total descent of 45 meters. It took 18:49 minutes to cycle the route on an average speed of 10.3 km/h. The aerial distance of the route is 2.20 kilometers (according to Google Earth) which gives a route directness ratio of 1.47 which is above the preferred maximum of 1.25. The trip by car takes 9:03 minutes which gives a travel time ratio of 2.08 which is over the maximum 2.0 preferred.

The route can be divided into three sections, the first section is within the Hlíðar neighborhood where cyclists are intended to cycle on the street as well as on separate cycle paths/lanes. The second section runs along the main road Miklabraut, and the third section of the route runs along Grensásvegur, which is a highly trafficked street with store fronts and parking lots.

At the first section of the route, within Hlíðar, cyclist are intended to cycle on the residential streets with a 30 km/h speed limit. On the street there are cycle sharrows (that

require some upkeep since they are rather worn off), to indicate to drivers that they are supposed to share the road with cyclists, see Figure 3-10. At a roundabout the same applies (see Figure 3-11) markings on the street throughout and cyclists and drivers are supposed to share the road.



Figure 3-10 Cycle sharrow



Figure 3-11 Cycle sharrow at the entrance of a roundabout

At Langahlíð, there is a separate cycle lane, at street level with an approximately one meter wide, elevated traffic island for further separation, as seen in Figure 3-12. The cycle lane is crossed by residential side streets four times and each time the cycle lane approaches an intersection an indentation leads the cycle traffic back alongside car traffic (see Figure 3-13), and then the cycle lane (separated from car traffic with a traffic island) continues. The cycle lane is also crossed by drives to residential parking a few times which poses a risk of cyclist being hit by cars backing up from these driveways. With this set-up cyclists need to be alert all the time when cycling on these cycle lanes, even though they are supposed to be specially designed for cyclists.



Figure 3-12 Separate cycle lane at Langahlíð



Figure 3-13 Indented cycle lane at intersection

When the cycle lane approaches the intersection with the major road Miklabraut it is led up on the sidewalk and then back down to street level where it is separated from car traffic with a painted, broken line where it then ends at the traffic lights, see Figure 3-14. This makes orientation for cyclist hard since there is not much coherence in the network. The road surface on this first part of the route is smooth pavement, however during the analysis it was partly covered with gravel since sweeping had not been performed after the winter season.



Figure 3-14 Cycle lane approaching intersection

From the intersection you continue on to the second part of the route, along Miklabraut, on a sidewalk laid with paving stone. The surface is mostly smooth with an exception of a few holes. The sidewalk is wide and is located alongside an apartment building. Cars were parked on the sidewalk and were difficult to get past, see Figure 3-15. There are a couple of residential parking drives there as well that cross the cycle/walking path. Cyclists could also cycle on the street but would then have to cross sidewalk curbs. On second thought another street parallel to this one would probably have been better to cycle on. There the cyclist could cycle on the street and avoid the paving stone laid sidewalk.



Figure 3-15 Cars parked on the sidewalk

To cross an intersection at Stakkahlíð, there is an elevated, colored pedestrian crossing, which increases separation between travel modes. After the intersection the walking/cycling path is about 10 meters from the heavily trafficked major road Miklabraut, separated from it with grass and surrounded by foliage on the other side. The surface is laid with uneven paving stone, causing a bumpy ride for cyclists (see Figure 3-16). The path is however straight and after a while the paving stones are substituted with smooth pavement.



Figure 3-16 Uneven surface

The first large intersection is where Miklabraut meets Kringlumýrarbraut, see Figure 3-17. Counting at the intersection, performed in October 2011 between 7:00 and 19:00, shows that cyclist constitute for 0.82% of traffic at this intersection. During counting, 123 cyclists were counted compared to 35.645 cars. (Helgadóttir & Reykjavíkurborg, 2012)

Cyclist and pedestrians have to cross a total of ten lanes to get across; two right turning exit lanes and three respectively five lanes in each direction which makes this intersection a huge barrier. The first right turning lane has no traffic signal, the next three lanes have a traffic signal where the cyclist/pedestrian has to push and wait for a green light, then they can carry on to a traffic island (see Figure 3-18), where they have to press again to cross the next five lanes, and then there is the second right turning lane which does not have a traffic light. There are painted broken lines that indicate the area where the pedestrian/cyclist is supposed to travel. This type of intersection is not very cyclist friendly with its long yield times, due to the fact that the cyclist has to wait at two separate traffic lights to be able to cross the street. It is however rather safe, if traffic regulations are followed and it provides good clarity for drivers and cyclist alike. However, more visible crossings might be of help at this intersection in order to make drivers more aware of the fact that cyclists/pedestrians do cross the street.



Figure 3-17 Intersection at Miklabraut/Kringlumýrarbraut



Figure 3-18 Intersection at Miklabraut/Kringlumýrarbraut

After this intersection the cycle route continues on a cycle path set with pavement that is rather worn. Shortly after the intersection the cyclist has to cross an exit lane, and then ride on a narrow path right next to Miklabraut, separated by a crash fence on one side and a fence on the other side, over an underpass for motorized traffic. After that the path turns to the right, past a gas station crossing a street on the way, with no particular crossing, and an entrance and exit ramp to the gas station. Almost immediately after this the cycle path crosses another street, with an elevated pedestrian crossing, and then turns left again to continue along Miklabraut. Up until the next intersection the surface consists of smooth pavement with cycle sharrows on the surface. There is no special lighting on this cycle path. There are trees along the path to increase separation between the cycle path and Miklabraut. At the next intersection, similar to the one described previously, where Miklabraut meets Háaleitisbraut the cyclist/pedestrian has to cross seven lanes; two right turning exit lanes without traffic lights and five lanes with one joint traffic light, without a button to press for those waiting to cross, and waiting time of more than 40 seconds. As stated above this crossing is safe, with its pedestrian crossing light but does not facilitate cycling well, since cyclist need to stop and move slowly through the crossing due to railings, even though they encounter a green crossing light.

From there the path continues on as before, until the next intersection where Miklabraut meets Grensásvegur. There the cyclist has to cross eleven lanes to get across Miklabraut, first a right turning lane with no traffic signal, the next five lanes have a traffic signal where the cyclist/pedestrian has to push and wait for a green light, then they can carry on to a traffic island, where they have to press again to cross the next four lanes, and then there is the second right turning lane which does not have a traffic light. As the previous two intersections, the crossing at this intersection does not facilitate cycling and creates barriers for cyclists, but it is rather safe since it requires cyclists to slow down before entering the intersection.

After crossing the intersection the route runs on a sidewalk along Grensásvegur, crossing an intersection with traffic signals for cyclists/pedestrians. The sidewalk is rather worn down as can be seen in Figure 1-1Figure 3-19).



Figure 3-19 Worn pavement at Grensásvegur

Then the route continues on a sidewalk located outside store entrances along Grensásvegur which leads to the cyclist having to navigate by pedestrians and cars moving out from alleyways (see Figure 3-20). The paved sidewalk is of poor condition on this part of the path. To get to Grensásvegur 1, two more heavily trafficked intersection have to be crossed, both traffic signalized (see Figure 3-21).



Figure 3-20 Sidewalk along storefronts



Figure 3-21 Intersection at Grensásvegur

Overall this route does not provide an attractive cycling environment, apart from it being direct and without detours. The environment is rather unattractive with the cycle path running along the major traffic road Miklabraut, generating pollution and traffic noise which affects the attractiveness of the path negatively, according to Nilsson (2003). The surface is smooth only on parts of the route which also contributes to making the cycle path less attractive according to literature at the beginning of this chapter 3. The part of the ride along Grensásvegur, that takes place on the storefront sidewalk, also contributes to an unattractive and uncomfortable cycling environment. The cyclist could technically ride on the street, but due to the fact that this is a heavily trafficked street, with two lanes in each direction this is not a very feasible alternative. The main disadvantage is however the delays and nuisance experienced at the large intersections on this particular route. One might however argue that this was not the best choice of route for this journey, since by cycling another (longer) route, part of the trip takes place on the cycle path along Suðurlandsbraut and through Laugardalur (if preferred).

3.3 Conclusions of the observational analysis

As stated in the beginning of chapter 3 from (Nilsson, 2003) and more an attractive cycling environment consists of a couple of attributes, it is direct, safe, coherent, comfortable, accessible, easy to use and mostly without delays. The first route boasts of a few of those attributes, especially an attractive environment (at least on part of the route) and mostly without delays. The second route, however, crosses large intersections that cause delays as well as having aspects that decrease mobility, such as a rough surface. Adding to that the route is in close proximity to a road with heavy traffic, resulting in noise and particulate matter pollution and therefore this is obviously a cycle route of low standard.

The two routes however do their part in portraying the overall situation of the cycling infrastructure in Reykjavík, even though there are cycle paths in parts of the city that provide an even better cycling environment, there are also worse situations for cyclist that are not portrayed here.

The conclusion of this analysis is that there are measures that can be done to increase cyclists accessibility within the city, and the fulfillment of the city cycle plan will certainly improve the preconditions for cycling within the city.

4 Interviews

Here the results of the interviews are presented, firstly the interviews with the cycle network users, the cyclists, and secondly the interviews with city planners and officials.

4.1 Interviews with cyclists/users of the cycle network

In order to establish a greater understanding of cycling in Reykjavík from the user's perspective a number of in depth interviews were conducted by the author. The respondents were chosen by various methods, with a couple being acquaintances of the author while others were total strangers. In order to get in contact with respondents, a message was sent to the chairman of the National Cyclist Association (LHM) who then pointed out people who met the criteria of being cyclists within the two neighborhoods. Those persons were then contacted and interviews set up with those who were willing to participate. An effort was made to establish a wide range of respondents of various age groups and social demographics, who all have in common the fact that they cycle to work, either occasionally or every day and live within the two neighborhoods being studied, Hlíðar and Breiðholt.

The interviews were carried out in January-March 2012. The respondents' background information is illustrated in Table 4-1:

Person no.:	Residence:	Workplace location:	Gender:	Age:	Occupation/Education:	Car status:
1	Breiðholt-Seljahverfi	Skeifan	Male	31	Engineer	Owns a car
2	Hlíðar	Skeifan	Female	50	Draftsman	Owns a car
3	Breiðholt-Bakkar	Skeifan	Male	31	Engineer	Owns a car
4	Hlíðar	Skeifan	Female	34	Secretary	Owns a car
5	Breiðholt-Fellahverfi	Ármúli, near Skeifan	Male	45	Biologist	Owns a car
6	Hlíðar	Hlíðar*	Male	36	Engineer	Owns a car
7	Breiðholt - Berg	Hlíðar	Female	55	Staff manager	Has access to a car
8	Breiðholt - Hólar	Hafnarfjörður	Male	40	Systems analyst	Owns a car
9	Hlíðar	Suðurlandsbraut, near Skeifan	Female	33	Has a Masters degree	Owns a car

Table 4-1 Respondents background information

*The respondent currently works from home but prior to that he worked at Grensásvegur, Skeifan

The interviews took place at either the respondent's residence or workplace, whichever they chose, and lasted for around thirty minutes up to an hour. The questions were quantitative (open), where the interviewer asked questions to which the respondents answered. This method was chosen in order to obtain more detailed responses than by for instance sending out a questionnaire with multiple answer questions.

The interview objectives are to let the interviewees:

- Inform about their current transportation habits
- Point out the pros and cons to using cycling as their main transportation
- Give their opinion on planned improvements to the bicycle network
- Make suggestions on how to improve the bicycle network in their neighborhood

The following interview guide was created to maintain continuity throughout the interviews.

- Social background – age, education, residence
- How does the respondent travel in the city?
- How does the respondent feel about cycling in Reykjavík/their particular neighbourhood?
- Is the respondent familiar with the Reykjavík city cycle plan – Hjólaborgin Reykjavík and if so, what is the respondents view on it?
- Why does the respondent cycle, and what does he feel are the benefits and detriments to cycling?
- What changes to the cycle network would the respondent like to see within their neighbourhood and on their cycle route to work?
- Where does the respondent feel is the best place within the city to cycle – and the worst?
- Would the person use cycle lanes adjacent (and not separated other than with a painted line) to car traffic? (One of the city's plan is to paint cycle lanes on existing streets in order to be able to fulfill their goals of more cycle paths every year)

4.1.1 Reasons for cycling and perceived benefits and detriments of cycling

When asked about the benefits of cycling the most common answers were that it is good exercise and that it saves money, both on oil/gasoline and on owning and managing a second car. These were followed by the fact that it is good for the environment and that it is a good way to unwind after a stressful day. Other benefits mentioned are the freedom you feel when cycling and it being convenient and contributing to overall wellbeing. The respondents' motivations for cycling were typically a combination of these factors, with the majority of respondents mentioning financial incentive. One respondent mentioned the Cycle to work challenge as an initial motivation to start cycling, another respondent mentioned that when she was young her mother did not own a car, which supported her choice to cycle, as well as financial motives. This corresponds with other literature (chapter 2 in the thesis), where people mention cycling being cheap and environmentally friendly as well as making cyclist feel independent and flexible. (Stangeby, 1997)

The detriments to cycling were harder to establish, with some respondents mentioning no detriments at all, while others mentioned the fact that it takes longer to run errands, as well as the fact that you sweat when cycling, especially when cycling longer distances, which forces you to change clothes, which in turn makes changing/shower facilities at your destination a necessity. Then again, most of the respondents do have access to changing facilities at work. Some respondents mentioned that the weather is often bad. However, even though those who only cycle during the summer and when the weather is good did not often mention the weather as a hindrance, it obviously is since they do not cycle when the weather is bad. When talking about the effect weather has on cyclists, one respondent, who only cycles when the weather is good and during the summer, said:

“It depends on who you ask, if you ask someone who cycles all year round, he will just dress accordingly to protect himself from the elements, while people like me take advantage of getting a ride or catching the bus when it is raining for example... ..I am not that much of a cyclist that I do not pay attention to the weather, even though some are and I support them” (Person no. 1, 2012)

Another respondent, who cycles all year round, said

*“You go out whatever the weather conditions and the weather is always fine”
(Person no.5, 2012)*

Yet another respondent, who cycles all year round, said

“I do not think of it as a disadvantage to cycling to arrive at your home soaking wet” (Person no.7, 2012)

This same person mentioned that the need for special clothing (to protect from the weather) might be a hindrance to some.

It seems that those who cycle all year round, and therefore experience all type of weather conditions, are not affected by the weather, which contradicts with other studies, which list the most significant negative factor as bad weather and lack of cycle paths. This might be caused by the fact that the respondents in this study were all cyclists, while respondents in other studies use all types of travel modes, since cyclists tend to have a more positive attitude towards cycling compared to those who use other travel modes. (Eriksson, 2009)

Only one respondent mentioned the cycle network not working well in some areas of the city. However, when asked especially about the cycle network most respondents had complaints as seen in chapter 4.1.2.

It was interesting that the respondents did not mention the risk of cycling when talking about the detriments of cycling, even though some of them cycle on the streets among motorized traffic, since according to another study (mentioned in chapter 2.1) the risk of cycling, especially due to other road users, was the most common reason for an unpleasant cycling experience. The reason for this not being mentioned here is most probably the fact that there are not many road users, who use the cycle network. The risk factor caused by traffic is however mentioned in chapter 4.1.5, when discussing cycle lanes at street level.

4.1.2 Improvements to the cycle network

The respondents were asked what improvements to the cycle network they felt were most important.

The most common answer was to add more cycle paths that are separated from pedestrians, since currently most cycle paths are so-called, all throughout the interviews, recreational paths, where cyclists and pedestrians share wide paved sidewalks that are not at all separated. Along some routes however, these recreational paths are separated with a 2+1 system in favor of pedestrians. Some respondents mention that these two travel modes do not fit well together due to their differing traveling speed, with pedestrians walking at an average pace of 5 km/h while cyclist cycle at a pace of 20 km/h, with some cyclists even reaching a pace of up to 30 km/h. This corresponds with other research on the subject, where more cycling lanes are considered the most important infrastructural measure. (Stangeby, 1997)

One respondent mentioned that public transportation and cycling should be more intertwined, such as with safe bicycle parking at main bus stops. Currently cyclists are allowed to take their bicycles on the bus if there is room in the back. Most bus stops do not

have any bicycle parking at all, while main bus stations offer low quality bicycle parking, with rails you can put your bicycle into and lock it onto.

Another respondent, who cycles all year round, felt that the cycle network should be more direct and more convenient for cyclists, he felt that when designing cycle paths designers do not always have the cyclist in mind, such as underpasses you access with a sharp and often blind turn in the cycle path. If the city cycle plan's goals of direct routes for cyclist are achieved this might no longer be a complaint. (Reykjavíkurborg, 2010) He also mentioned that in his opinion,

“The whole transportation system seems to be designed by someone who has read about bicycles but owns a car... ... you notice that when you drive a particular route it's great, you maintain speed and the turns are comfortable and then there is a straight part again. However when you [cycle the same route] there is a sharp angled turn and then a straight part and then another sharp angled turn, blind hill or blind turn [on the cycle path]. It feels like [the bicycle] is not on the same pedestal and does not have the same respect as the private car.” (Person no.8, 2012)

Another respondent, who cycles during the summer months, also touched on this and said that cycle paths should be put where people actually want to cycle, and not just alongside the main road network.

A couple of respondents also mention that crosswalks are often located defectively, at least for cyclists, since they mislead drivers into thinking that cyclists cycling on sidewalks are making a turn when they are in fact merely making necessary actions in order to cross the street. These are the crosswalks located on side streets, frequently a few meters from the intersection with the main street. With new instructions for designing cycle paths in the city of Reykjavík (mentioned in chapter 1.5.3) this problem can be solved. (EFLA, 2011)

Some of the respondents also talked about the importance of cycle sharrows on the street to alert drivers that cyclist also use the streets. One respondent also mentioned the need for signs to remind drivers to “share the road”, since he feels a lot of drivers do not pay attention to cyclists on the streets.

The route along Miklabraut was also mentioned a couple of times as needing some improvements, especially the intersection with Kringlumýrarbraut. It also crosses many exits for cars which lead to many curbs, and it also has a lot of twist and turns, as seen in chapter 3.2 of the observational analysis.

The issue of snow not being cleared from the cycle paths, as well as snow that is being cleared from the streets being pushed up to sides, landing on sidewalks, was a recurring

subject since this was a current issue due to heavy snow all over the city when the interviews were carried out. Due to decreased funding to snow clearing some sidewalks were not cleared of snow for days. Some respondents felt that this was not acceptable and needed to be amended.

One person mentioned the current lack of bicycle parking, and substandard parking facilities at many places that need to be amended, such as rails that can cause damage to parked bicycles when they fall or collapse due to wind.

Those who lived or worked in Hlíðar also mentioned that the cycle path in Langahlíð is poorly designed and does not fulfill the requirements of a safe cycle path (see chapter 3.2 of the observational chapter, where this cycle path is analyzed). Its design needs to be modified to make it safer for cyclist to cycle on. One respondent said that she does not allow her children to cycle on this path; she insists they cycle on the sidewalk instead.

One respondent, who cycles all year round, said that if he wasn't the experienced cyclist he is, he would probably be chattering on about more cycle paths but he feels that cyclists belong on the streets, among motorized traffic.

This seems to be a recurring issue throughout the interviews, the most experienced cyclists who cycle all year round feel safe on the streets and that they belong there, but the cyclists who only cycle during the summer or occasionally feel unsafe on the streets alongside traffic and want separate cycling facilities.

4.1.3 Where do the respondents like/prefer to cycle?

When asked where they prefer to cycle most of the respondents mentioned the cycle paths that run along the shore. They start at the outskirts of Reykjavík and Mosfellsbær and continue around Reykjavík, alongside Sæbraut, along downtown, Ægissíða and then continue on through Nauthólsvík, Fossvogur and Elliðarárdalur (technically not the shore but the same type of cycle path/recreational path). These cycle paths are paved and have a one way cycling path, separating cyclists and pedestrians. The Laugardalur area, which contains a recreational, not separated, paved path was also mentioned. One person also mentioned Suðurgata where a cycle lane has been constructed, quite efficiently.

4.1.4 Where do the respondents dislike/not prefer to cycle?

When respondents were asked where they did not like to cycle a couple of them mentioned the Elliðarárdalur area being too crowded for cycling when the weather is good, since it gets too crowded with pedestrians. This would not be a problem with two-way cycle lanes, separated from the walking path. One person mentioned the city centre, due to it being too narrow and crowded for cyclists. A couple of respondents mentioned sidewalks in general, especially when they have a tiled foundation, since the tiles can be hazardous for cyclists,

in situations where the tiles are unevenly laid or when the bicycle tires are so narrow they get stuck at the tiles seams, as well as sidewalks having curbs you have to cycle over, which is very unpleasant. A couple of respondents also mentioned the cycle path along Miklabraut not being a particularly good route to cycle along, especially due to traffic pollution and intersections that do not facilitate cycling (this cycle path is thoroughly described in chapter 3.2).

4.1.5 Would respondents use cycle lanes in the streets?

The respondents view on cycle lanes at street level varied. The majority responded that they would use cycle lanes at street level since that would be a much more comfortable way to cycle, since the streets are direct and well maintained. Some of the respondents, especially the more experienced cyclists who cycle all year round, currently cycle on the street alongside car traffic and feel much safer there than at designated cycle paths. Some of them state the reason being that drivers are more aware of cyclists when they are on the streets than when they cycle on separate cycle paths. A couple of respondents mentioned that most accidents that involve cyclists and cars happen when a car is turning and runs into the cyclist and according to him, apparently accidents where cyclists are hit from behind are not common.

Other respondents, who all happen to be cyclists, who do not cycle on a daily basis, would not use cycle lanes at street level since they felt this would be unsafe, stating that:

*“I would not dare, the cars are too crazy, I am too afraid of those crazy drivers.”
(Person no.2, 2012)*

“Icelanders do not know how to drive among cyclists...so I wouldn't use it until after a 20 years experience” (Person no. 1, 2012)

4.2 Interviews with persons from the city

Three interviews were carried out with persons involved in city and traffic planning, and decision making within the city planning sector. They were chosen by the author on account of their participation within city and traffic planning.

One is a project manager at the division of the Environment at the city of Reykjavík, the other two are involved in the city's councils.

The interviews lasted for almost an hour per interviewee. Two of them took place at the respondents' workplace and one at a café. The questions were quantitative (open), where the interviewer asked questions to which the respondents answered.

An interview guide was constructed for each of the interviews, but with a similar basis, in order to establish a wide understanding on the respondents work within cycle planning in the city as well as the respondents view on how that work is progressing. The reason for the various interview guides was to get the most information out of the interviews, since all of the respondents work for the city on overlapping projects but from various angles. Otherwise the interviews would have developed very similar results.

The interview guide for Pálmi, project manager at the division of the Environment at the city of Reykjavík was as follows:

- Background information
- What does the person feel about the bicycle's current status as a travel mode?
- How is the city cycle plan progressing?
- What is on the agenda to be done to increase the bicycle's modal split?
- What factors are important to consider?
- What is the respondents travel mode? If the respondents cycles, then why and what does the person consider are the benefits and detriments of cycling?

4.2.1 Results from an interview with a city planner

Pálmi Freyr Randversson, project manager at the division for the Environment at the city of Reykjavík was the city planner chosen for the interview since he was a visible spokesman for the transportation sector at the city's division of Environment. Pálmi was in charge of the planning and production of the city's cycle plan and now takes part in planning cycle paths within the city along with various other projects within the city centre aimed at encouraging a more vivid city life, such as prohibiting motorized traffic for longer periods of time on parts of the main shopping street, Laugavegur, which is otherwise open for motorized traffic.

He reveals that the city's current focus within transport related issues is entirely on cycling. Almost all investments towards transportation and city planning go towards cycling, or about 90%. About 500 million Icelandic kronas (around €3 million) are going towards investments within cycle related projects. In addition to this the municipality has submitted an application for a loan from the ELENA technical assistance facility which will be used partly for improvements and the development of the cycle network. In comparison only 50 million kronas (around €300 thousand) are going towards car related measures. A large number of cycle paths have already been designed, they only need to go through a more detailed planning process and can subsequently start construction. Multiple projects are planned for this year and a lot has been completed over the last couple of years. A cycle path in Fossvogur and Ægissíða has already been doubled to accommodate two-way traffic in addition to being completely separated from the walking/pedestrian path, which is the first time this is done in Reykjavík apart from a small piece of cycle path in Langahlíð and a short cycle lane on Laugavegur. This improvement and addition to the cycle network is a step in the right direction for the city of Reykjavík according to the previously presented literature.

In his opinion people are starting to value cycling as a true alternative to other travel modes, which might be correct, at least according to travel surveys, where more people cycle in 2011 than in 2002. (Capacent Gallup, 2011) He also feels, even though it is a delicate issue within city planning, that we need to corner the private car some more, such as the removal of parking spaces to make room for cycle lanes in places/streets like Borgartún, similar to the push and pull policies mentioned in chapter 2.3. He says that the estimated cost of constructing the pledged 10 km of cycle paths each year is about 1 billion (around €6 million) per year, with all possible executions taken into account, such as construction of new cycle paths, restoration of existing cycle paths and changes at intersections to facilitate cycling. Planned procedures, hopefully to be carried out in the summer of 2012 are the construction of a new cycling bridge over Elliðarársar to shorten the distance for those cycling from Grafarvogur and Höfði, along with improvements to the cycle path along Suðurlandsbraut to Laugardalur, which is the busiest cycle route in Reykjavík. These constructions are confirmed to take place in this summer, 2012. Also scheduled are improvements to the intersections along Miklabraut, at Grensásvegur and Háaleitisbraut in order to facilitate cycling. He also mentions that they want to incorporate the typical elevated Danish cycle lanes more within the city centre. Both of these actions would be huge improvements to the cycle network since these intersections (along with the one at Kringlumýrarbraut) are huge obstacles for cyclists, as noted in chapter 3.2.

When asked about the progress of the city's cycle plan concerning measures to encourage people to cycle he says not much has been done in that area, except city employees encouraged to lead with a good example such as cycle around town on company bicycles,

as well as the city partly funding and taking part in the Cycle to work challenge. The city has a transport policy and a transportation grant, as well as a transportation contract underway that will reward those who choose other methods of transportation than the private car. The city also supervises a transportation week where they address transport related issues with conferences and lectures, aimed at professionals within the transportation sector as well as the public. The city should indeed point focus on this since, according to chapter 2.4, these might generate even larger increases in cycling levels within the city than infrastructural measures. (Svensson, Gång- och cykeltrafik, 2008)

He thinks it is important for the city life to have cyclists on the streets, it makes the city more charming as well as improving public health and being good for the environment, in which literature from chapter 2 agrees. (Pucher & Buehler, Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany, 2008)

The interview guide for the two city officials was as follows:

- Background information
- What does the person feel about the bicycles current status as a travel mode?
- How is the city cycle plan progressing?
- What is the bicycle status within the revised master plan for the city?
- What are the city's next steps in increasing the bicycles modal split? Are there any actions currently ongoing?
- What are the most important factors to focus on when trying to increase cycling?
- What is your travel mode? If bicycle then why does the person cycle, and what does the person feel are the benefits and detriments of cycling?

4.2.2 Results from interviews with city officials

The first city official interviewed was Gísli Marteinn Baldursson who is a city councilman in the city of Reykjavík, elected to serve on the city planning council and the city's environment and transportation council. He has been quite prominent in promoting cycling within the city, and has a Masters degree in an interdisciplinary study called The City. He constructed the city cycle plan along with Pálmi Freyr Randversson and others.

The second city official interviewed was Dagur B. Eggertsson who is chairman of the city council in Reykjavík and chairman of the city's environment and transportation council.

Gísli said that what we need to cure the city of Reykjavík from is the domination of the private car. However this does not mean that no one should drive a car, but rather that a higher percentage should cycle, walk and use public transportation.

Dagur also mentioned that this is “not an either or type of matter, you do not solely walk, cycle drive or use public transportation, you use different [modes of transportation] depending on what you are doing... ..and as soon as you realize this, the smoothest system is what really matters”. He mentioned a new way of thinking within the transportation sector, cycling included. He feels the way of thinking about cycling as transportation has transformed fundamentally over a short period of time, starting in 1994 with the construction of a few hundred kilometers of recreational walking/cycling paths all over the city. Then the creation of a special city cycle plan was presented with the possibility of separate cycle paths intended as major cycle routes and to increase cyclist safety. This was followed through with the approval and publishing of the city cycle plan in 2010.

According to Gísli the city cycle plan was intended partly for propaganda purposes, to show people that cycling is fun and good for you, as well as giving officials and city planners a thorough report to work by. The ideology behind the city cycle plan was in part to make the cycle network in the central city denser. However this does not mean creating cycle paths/lanes everywhere but rather coming up with a solution on how cyclists are supposed to travel around even though on some streets cyclist are intended to cycle on the streets alongside other traffic. However, separate cycling facilities seem to be a very important factor in cities with prosperous cycling environments, but with the small share of cyclists in Reykjavík it is hard to rationalize separate cycling facilities all over the city. (Pucher & Buehler, Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany, 2008)

There is also a widespread support among city officials towards the aim of increased cycling within the city, and those who do not agree do not dare to speak their mind. The formerly delicate issue of implementing possible measures to reduce car traffic is not as delicate anymore.

This widespread support for increased cycling within the city could be utilized to incorporate the previously mentioned push and pull policies in order to increase the bicycle modal split.

According to both city officials little was done fulfill the city cycle plan in 2011 but in 2012 quite a lot is on the agenda, the largest single construction being the cycling bridge over Elliðarársar, to cut down the distance for people cycling from largest neighbourhood in Reykjavík, Grafarvogur, along with vast improvements to the cycle path alongside Suðurlandsbraut, which has proved to be an important and much used cycle route. In the cycle to work challenge cyclists were asked to document their routes and submit comments about its current state and on that path there were large volumes of cycle traffic and along with large amounts of complaints about its state.

The application to the European Investment bank's ELENA fund, previously mentioned in Pálmi Freyr Randversson interview, would speed up construction of cycle paths according to Dagur, since 3 billion kronas (€18 million) of the loan would be put towards cycle related measures which would speed up the city cycle plan substantially.

Gísli feels that a cycle route along Borgartún, connecting the cycle route along Suðurlandsbraut to the central city, would create a great bicycle highway to connect the Eastern parts of the city to the central city.

When asked about the bicycles position Gísli says that cycling has increased a great deal according to the recently published travel survey (mentioned in chapter 1.5.9) even though he does not think politicians are entirely to thank since cycle facilities in the city have not improved a great deal. This is more a question of the attitude of being in shape, increasing oil prices, and the fact that when people start to cycle (as in the cycle to work challenge) they discover what a great travel mode the bicycle is.

Gísli also mentions how free parking at destinations influence people's mode choice. In the US it is stated that 99% of all trips end with free parking, and this is probably the case here in Reykjavík as well. (Shoup, 2005) The city owns most of the land used for parking facilities and the city needs to pay for maintenance, as well as the land itself being valuable. The car is a subsidized travel mode and an Icelandic mathematician has even calculated that the fuel wages do not cover the construction and maintenance of the road network. Attitudes towards parking fees have however changed a great deal according to a survey the Reykjavík parking service carries out once or twice a year (it inquires people about whether parking fees are acceptable within the city centre). About six years ago the results were 50/50 but now the percentage of those in favor of parking fees is up to 70-80%. He also says that when designing new central neighborhoods there are only 0,5 parking spaces per apartment, that means that some apartments have one parking space while others do not have any, since it is much easier to live without a car when living in the central area of the city. The same goes for student housing near the two largest universities where parking is kept at a minimum. Since these two groups are, according to the travel survey, more likely to cycle than others, doing this might push them even further towards using the bicycle to travel. (Capacent Gallup, 2011)

On the subject of constructing cycle lanes by painting lines on the streets Gísli says that this could pose a problem if cyclists do not use them. In Edinburgh (where he lived for a short period of time) he noticed that at some point the cycle network was restored, mainly by painting lines on the existing streets to form cycle lanes. Then there was not as much of an increase of cyclists as the planners had anticipated and drivers started parking their cars on the cycle lane and subsequently this was considered acceptable since no cyclists used the

cycle lanes anyway. According to one of the cyclists interviewed in chapter 4.1 this is a problem in the Hlíðar area as well, since she has on numerous occasions encountered parked cars on the cycle lane in Langahlíð.

When Dagur was asked about this subject he said the painting of lines at street level to form cycle lanes had been completed on trial at various locations as a “meanwhile” project.

When asked about intended measures to increase the bicycles modal split Dagur mentions improvements to the cycle network, even though it is not enough to build something if no-one uses it. He also mentions smaller actions such as the cycle to work challenge. He also mentions recent studies about the importance of getting women to cycle, since studies show that if the woman of a household cycles she is more likely to influence the children and the man to cycle rather than if the man of a household cycles he is more likely to be doing so on his own without influencing other members of the household.

Other actions such as closing streets from car traffic also contribute to a better environment for pedestrians and cyclists alike. This correlates with literature from chapter 2.4, where political methods to increase cycling are addressed. (Pucher & Buehler, *At the Frontiers of Cycling: Policy Innovations in the Netherlands, Denmark, and Germany*, 2007)

Gísli again mentions a denser city in order to increase cycling, even though that is a long term goal, but at least to stop spreading the city, immediately. Another important factor is the construction of cycle routes, which should be separated from car traffic and pedestrians, they should solely be for cyclists. He would prefer to have cycle lanes everywhere but realizes that is not a realistic goal, so he says that at least everywhere cyclists should be considered. A third factor is to remove hindrances that allow people opposed to cycling to make excuses, like installing cycle parking at various locations. According to interviews with cyclists in chapter 4.1.2 this was exactly a complaint of some of the respondents. He also mentions that some say the ideology in cycling should be “if you build it then they will come” but he says he supports measures that do not always have to be expensive.

According to Dagur the extreme cyclist, who cycles long distances from home to work, wearing specialized cycle clothing and who require shower facilities at their destinations, have dominated the policy formation, since they have throughout the years been the most visible cyclist group on the streets and one can argue that by satisfying their wishes you are satisfying the wishes of cyclists in general. The main focus now however is to get the public to cycle, to make cycling a more of a casual thing. Gísli agrees with this, he shares the ideology of the website Copenhagenize (which covers cycling in Copenhagen along with cycling all around the world), cycling should be easy and convenient, you should not have to wear special clothing or be obligated to use a helmet when you cycle.

Gísli also mentions that when the path along *Ægissíða* was doubled (made a two way separated cycle path) some cyclists complained and said they would rather have a cycle route along the major road network, which he responded to by asking them if they would be happier if they were cycling next to a highway there (since originally this was supposed to be a highway).

Dagur talks about how they are considering the best option to connect the different travel modes and with that the relocation of the public transportation center from Hlemmur to BSÍ, in order to open up our own Denmark, a flatland in the central city (Vatnsmýri and Kvosin) where over 40 thousand workplaces are located with a great deal of people passing through. The vision is to use smaller electric shuttles to serve the University and central city area efficiently along with buses as well as cycle shelters (cycle parking) and cycle rentals both at the destination and in the connecting areas within the neighborhoods. He believes this would be a breakthrough in the use of bicycles and public transportation within the city. These changes are currently in the works. Gísli says that the idea with the possible new neighborhood in Vatnsmýri is that “the cycle network is built alongside other construction”. Furthermore, at the new hospital area, cycle paths are designed right from the start. Everywhere in the area close to the city centre cyclists are taken into account in new constructions.

Gísli says that cycle paths will probably not be marked specially in the revised master plan for the city currently being created (as mentioned in chapter 1.5.6). There will however be aims directed at increasing the share of environmentally sound transportation within the city and in turn the reduction of car traffic. They do not use any particular cities as examples even though they have taken tours of cities such as Malmö, Helsinki, Berlin and Barcelona and have been introduced to how their master plans were accomplished. He feels the most important part of the master plan (which is valid until 2030) is how we envision the city to be like in 2030. Do we want a city for cars or are we going to react and reduce traffic, and by what measures. The most important factor in his opinion is a denser city, in which the revised literature such as Pucher & Buehler (2007) agrees.

Dagur lives in the city centre, close to the city hall so he usually walks to work.

Gísli mainly cycles but sometimes he uses the bus or car. He describes himself as a leisure cyclist who does not wear special clothing when cycling, he cycles wearing a suit and tie. He feels that cycling is by far the most fun way to travel, as well as you being able to spend your money on other things than the car. He feels that cycling gives you a “sense of place” and that you want to be around people and feel as part of a society. The city centre’s main shopping street Laugavegur is the best street suited for this, and therefore he wants to put a cycle lane along all of Laugavegur. However it is much harder to construct a cycle lane on

Laugavegur where you have parking spaces and underground plumbing, than for instance the cycle bridge at the open space at Elliðarárósar. He also maintains a blogs for propaganda purposes.

After these interviews it seems as if though the city of Reykjavík's administration is on the right track to improving the city cycle network and thereby increasing the bicycle's modal split. With a combination of actions, such as construction, propaganda and push-and-pull policies they might even succeed.

5 Discussion and analysis

At the beginning of this thesis a few research questions were put forward. This chapter is an attempt to answer these questions, using the research presented in this thesis.

What is the current status of the existing bicycle infrastructure on the routes connecting the two neighborhoods Breiðholt and Hlíðar to Skeifan?

The current status of the existing bicycle infrastructure is poor when compared to other cities with high levels of cyclists, but acceptable if compared to other parts of the city of Reykjavík, since, in some parts of the city, there does not seem to have been any attention paid to bicycle traffic. The standard of the current infrastructure on the route from Hlíðar to Skeifan is not acceptable, since there are hazardous areas located on the route, such as obstacles on the sidewalk and an uneven surface. The standard of the infrastructure on the route from Breiðholt to Skeifan is better, with a more coherent path and smoother surface.

What do cyclists feel about cycling within the two neighborhoods and to and from work and from their own experience, what do they feel works well and what does not?

The results from the cyclist interviews confirm the results from the observational analysis. The route from Hlíðar to Skeifan, especially the Miklabraut part, was commonly mentioned as a cycle path of low standard, mostly due to traffic pollution and a number of intersections that are not cycle friendly. The route along Langahlíð was also mentioned by those who live in the Hlíðar neighborhood, in relation to being poorly designed and therefore unsafe. This correlates well with the observational analysis' results. This was also true for the route from Breiðholt to Skeifan, the Elliðarárdalur was mentioned as a nice place to cycle (even though some feel it is too crowded with pedestrians) and other parts of the route were hardly mentioned, neither in a negative nor positive sense.

According to the cyclists' interviews, what works well and what does not, depends on which type of cyclist is asked. If you ask those who currently do cycle on the streets, they do not feel there is a need for better bicycle infrastructure since that would require them to move from the streets onto special cycle paths or lanes, which some of them do not want to do as they feel this would constrain them. But if you ask a recreational cyclist you often get the answer that additions to the cycle infrastructure, such as special cycle lanes are indeed necessary. However most of the cyclists felt there was a need for better preconditions for cyclists, even though they did not agree on what that should include.

What do cyclists feel is important when planning the cycle network in the two neighborhoods and in Reykjavík?

The most consistent issue throughout the interviews was that the cyclists wanted more attention being paid to cyclists and the cycle network, and that the cycle network should be designed by someone who actually knows something about cycling.

What do planners and politicians think about cycling in Reykjavík, and what are their views on how to increase cycling?

The planners and politicians all agreed that a city with cyclists on the streets is a good city, but their opinions on how to get people to cycle varied. Their views were not necessarily to add to or improve the cycling infrastructure but more in line with changing people's habits, and views on transportation. However, there seems to be an ongoing debate on whether to obey the wishes of the sport cyclists, who constitute for the majority of those who currently cycle all year round in Reykjavík and mostly want to cycle on the streets, or to look to cities with high shares of all types of cyclists for inspiration and prioritize a safer and more direct cycle network built up of separate cycle paths.

Are there any official plans for improvements or additions to the existing bicycle network infrastructure on the two routes?

Currently there are no official plans for improvement of these two routes. However, a large portion of expenditures towards transportation planning are going towards the improvement of another route that, according to surveys carried out during the cycle to work challenge, is a commonly used route among cyclists.

6 Conclusion

The Reykjavík city cycle plan from 2010 presented a vision of a city, a bicycle friendly city where cyclists move around using a dense network of specially constructed cycle paths and lanes and receive more consideration within city planning. Instructions for the design of these cycle paths were presented in 2011 to further enhance the quality of this new cycle network.

The city of Reykjavík presented an environmental policy in 2005 aimed towards establishing a sustainable community in Reykjavík. The policy is in terms with both the Local Agenda 21 ideology and the Aalborg commitments which are worldwide sustainability agreements. The city also presented a transportation policy in 2006 which aims are to reduce transportation's negative effects on the society and focus on its positive aspects such as health benefits of walking and cycling. A climate policy has also been presented, with its main goal to reduce emission of greenhouse gases from transportation by increasing the number of those who walk and cycle. The revised master plan for the city furthermore promotes a denser land use and prioritizes people instead of construction volumes or carrying capacity.

Despite all this the bicycle's modal split within the city in 2011 was only 3.8 %. This is high when compared to the bicycle's low 0.3 % modal split in the year 2002, but low when compared to other Scandinavian cities such as Copenhagen and Lund. In the two neighborhoods these numbers vary, with 4.9 % of people in Hlíðar cycling compared to 2.3 % of people who live in Breiðholt, which supports declarations about people who live closer to the city centre being more willing to cycle than others.

The city's cycle network mostly consist of sidewalks and recreational paths that cyclists have to share with pedestrians, which can cause disturbance to both the cyclist as well as the pedestrian and raise accident risk on the path. Of the two routes analyzed the route from Breiðholt to Skeifan upholds a much higher standard than the one from Hlíðar to Skeifan, since intersections on the latter route are several and not very well suited for bicycle traffic as well as it being located in an unattractive environment near a major road. Both of these routes however lack separated cycle paths/lanes.

However, everyday cyclists in Reykjavík seem to be content with riding on the streets, alongside motorized traffic, but they do have complaints about the cycle network in general. Summer cyclists are generally scared of cycling in traffic and most of the cyclists feel that car traffic is not very considerate towards cyclists in general, even though most agree this has changed for the better over the last few years. The results from the cyclist interviews are in agreement with results from other research, where cyclists mention the benefits of cycling being the exercise, financial and environmental benefits. The detriments

were harder to establish with some mentioning the inconvenience of sweating when you cycle while others mentioned the weather. Most of the respondents agreed that there was a substantial need for more separate cycle paths and some of them coveted a more direct cycle network. One cyclist even addressed the importance of a better connection between cycling and public transportation.

The city officials all agree that there has been an awakening among the city's administration about the need to increase the bicycle's modal split, along with widespread support for promoting this particular travel mode. However, this has not encouraged them to notably invest in cycle related measures, until this year of 2012. Substantial constructions are however scheduled this summer that cut down distances for those cycling from the outskirts of the city and improve the most popular cycle route by separating the cycle paths from the pedestrian walkway and making intersections more cycle friendly. Future intended measures include more connections between different travel modes, so that people travelling longer distances can combine for instance cycling with public transportation.

All things considered it seems as if the city of Reykjavík is moving towards being a more bicycle friendly city, even though these steps are small to start with. The city might benefit from integrating more propaganda related measures in order to motivate people to cycle, since these have proven to work well in other countries, especially if combined with tangible rewards for those who choose to cycle.

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7.4 Interviews

Reykjavík

Person no. 1 – January 5, 2012

Person no. 2 – January 5, 2012

Person no. 3 – January 12, 2012

Person no. 4 – January 12, 2012

Person no. 5 – January 26, 2012

Person no. 6 – January 26, 2012

Person no. 7 – February 2, 2012

Person no. 8 – February 2, 2012

Person no. 9 – March 1, 2012

Pálmi Freyr Randversson – January 19, 2012

Gísli Marteinn Baldursson – March 14, 2012

Dagur B. Eggertsson – March 26, 2012

Appendices

Appendix A Summary from interviews

The two neighborhoods in question are Breiðholt and Hlíðar and the destination area is Skeifan and surroundings. The route from Breiðholt to Skeifan is through Elliðarárdalur (a path that runs along a river) and the route from Hlíðar to Skeifan runs along Miklabraut, a major route.

Person no. 1

- A 31 year old male engineer, lives in Seljahverfi, Breiðholt and works in Skeifan
- Owns a car. Takes advantage of the company's transportation grant. He cycles to work during the spring and summer, and rotates between using public transportation (bus) and getting a lift with his girlfriend
- Lives close to a main cycle path, cycles a rather convenient path all the way to work, through Elliðarárdalur, with tunnels under the main traffic roads. Does not have to get much involved in motorized traffic
- Also cycles for pleasure such as trips downtown and then rides the bus home, and cycles shorter trips but uses the car for longer trips
- Is not familiar with the Reykjavík cycle city plan
- Would like to see more of special cycle paths instead of the unmarked pavements that are supposed to serve both cyclists and pedestrians. Some of them are divided with a narrow path for cyclists and a double path for pedestrians. Does not see a need for two way paths since the traffic flow is not that high, except during the cycle to work week/month. Feels there is a need to widen sidewalks before they can be divided into cycle and walking paths
- Feels that many of his coworkers are happy with, and use, the transportation grant, which means the employees get paid not to park their cars on the company parking lot, e.g. use other means of transportation, such as bus, bicycle or getting a lift
- The benefit of cycling is being outdoors, saving money and receiving money (the grant), improved mental and physical health. Would not cycle if there was not a shower facility in the workplace
- Arguments against cycling are that you are not able (or at least it takes longer) to do private errands as easily. The company has a car for company use such as meetings outside the office.
- Would not use cycle lanes that are painted on existing car lanes because Icelanders do not know how to drive among cyclists. Maybe after 20 years of experience. Also he does not think many streets could do with losing 1, 5 meters for cyclist due to them being crowded as is.

Person no. 2

- A 50 year old female draftsman, lives in Hlíðar and works in Skeifan

- Owns a car. Takes advantage of the company's transportation grant. Usually walks to work but cycles (around 3 kilometers), during the summer.
- Prefers to cycle a longer than necessary, more pleasant route to work, through the open area Laugardalur, instead of the shortest route along Miklabraut.
- Also cycles for pleasure and short trips, uses cycle paths along the coastline and likes it
- Is not familiar with the Reykjavík city cycle plan
- Does not like to cycle in the city center (Miðborgin), feels it is too narrow and not designed for cyclists
- Benefits of cycling are the pleasure and the freedom
- Arguments against cycling are when the streets are slippery
- Would not dare to use cycle lanes that are painted on existing car lanes, the cars (drivers) are too crazy and dangerous.

Person no. 3

- A 31 year old male engineer, who lives in Bakkar, Breiðholt and works in the Skeifan area
- Owns a car, but has cycled to work almost on a daily basis since this summer. Before that he used public transportation
- Uses a motorized bicycle which has an attached battery driven motor (which costs around 100-150 thousand) and can travel on a speed of up to 45 km/h. Each charge lasts for about 30-40 kilometers.
- Really likes this, since this means you do not have to shower after cycling and he uses it in all weather conditions with the right equipment, such as a helmet and ski goggles when the weather is really bad
- Cycles on sidewalks and main walking/cycling paths, almost never on the street, unless on quiet streets with speeds limits of 30 km/h. The snow is usually removed from these paths.
- Feels there are not a lot of specially designed cycle paths, which is never good especially on sidewalks where there is no separation between pedestrian and cyclists. When there is separation the cycle path is very narrow
- Also cycles for pleasure, he and his wife cycle together, and with their two children in tow in a cycle carrier, as well as shorter trips to the store and such
- Knows the city cycle plan, and has used it in his work, thinks it is an ambitious project, but without sufficient funding to follow through. Is part of a team who works for the city of Reykjavík to apply for a grant called Elena, which will be used to empower public transportation and improve facilities for cyclists. Says the city officials are waiting for this to start to improve cycling facilities within the city.

- Would like to see more separated paths for cyclists, cyclists should be completely separate since the travel speed, around 20 km/h, is totally different from the one of pedestrians (5 km/h) and cars driving at 50 km/h. Preferably, cycle paths should be at a higher level than the car street and then the sidewalk for pedestrians at a higher level than the cycle path. The city has instructions on how the design of cycle paths should be carried out, and uses this on future designs. This involves that cycle paths should be in both directions of a street and the width should be double, to allow for cyclist to pass each other.
Also feels that public transportation and cycling should be more intertwined. Mentions that buses where he lived in Seattle had special railings on the front of the vehicle to put your bicycle on, without a problem. In the Reykjavík city buses you take you bicycle onboard the bus. Feels there is not much co-operation from the public transportation sector. Also speaks of the last mile phenomena, where you combine travelling with public transportation and then ride a bicycle the last mile. This requires bicycle parking near the main bus stops and transfer centers.
- Reasons for cycling are mainly financial. A car is expensive. And then when you get into cycling you feel a lot fresher and also get rid of the traffic which he hates. Also mentions social factors such as it does not increase traffic.
- One main downside of cycling is that you are working out and get sweaty, as well as the cycle network not working well in some areas of the city.
- Would use cycle lanes located at street level in low-speed suburban streets, but not really on larger streets with more speed. Also he thinks the markings would not last very long with the heavy snow that needs to be pushed away with heavy machines during the winter. But the idea is good and cheap, to raise awareness, among drivers, that there are cyclists out on the streets and that drivers can expect that everywhere in the city. Not a permanent solution.

Person no. 4

- A 34 year old female secretary who lives in Hlíðar and works in the Skeifan area
- Usually travels by car but cycles sometimes in the summer, receives the company's transportation grant sometimes during the summer
- She sometimes cycles short trips, and when she cycles to work she chooses the more scenic, safe and pleasant route, through Laugardalur, over the shortest one along Miklabraut. She does not cycle on the street
- Rather content with the existing cycle path network but would like to see more cycle paths, especially in the city center, where it is rather hard to cycle
- Is not familiar with the city cycle plan
- Motivated to cycle when the weather is good. Benefits of cycling are the exercise as well as not using the car, saving money on gasoline

- Does not mention any downsides
- Does not like to cycle near main roads
- Would be scared of riding on bicycle lanes on street level, because of the cars driving so fast
- Feels like she cycles more and more with each passing year, probably because of the gasoline prices skyrocketing, as well as enjoying the exercise and likes not to contribute to the emission of gases from the car

Person no. 5

- A middle aged male biologist who lives in Fellahverfi, Breiðholt and works in Ármúli (near the Skeifan area)
- Has cycled to work since 2001, mainly because his workplace has few parking spaces, and almost every day since 2003. Owns a car which his wife mainly uses. His cycling to work enables them to own only one car (instead of two which is common in Reykjavík). Sometimes he uses the bus when the weather is bad
- Cycles on lightly traveled low speed streets and the Elliðarárdalur area which has special cycle path, as well as alongside car traffic where needed
- He also cycles shorter trips like to the store, it is beneficial not having to search for parking, as well as not having to scrape snow off the car windows
- Is not familiar with the city's cycle plan, but does pay attention to improvements within the cycle network
- He feels that the cycle paths we have now (for instance in Elliðarárdalur) are better described as recreational paths than cycle paths, and are not well suited for bicycle traffic. Would like to see more cycle lanes on streets, next to car lanes, and feels that drivers would then pay more attention to cyclists
- Did not like the cycle path they put on Hverfisgata (in the city center), since it was located where street parking used to be and therefore was quite bumpy
- His motivation for cycling is that it is convenient, and enables him and his wife to share one car, as well as the exercise and benefits for the environment. Part of his life now, no matter how bad the weather is, it's always good
- According to him, cycling has no downsides
- When the weather is windy he likes to cycle in the Elliðarárdalur area, since it has coverage from the wind (trees and such). But if the weather is good that area can get crowded
- He feels that the sidewalks are the worst to cycle on, because they are unsafe for cyclists since drivers only notice oncoming traffic and do not pay attention to cyclists on sidewalks
- Would use special cycle lanes on street level

- Would like to add that he feels we should put up more signs, like for instance similar to those in the USA where they have “Share the road” signs to remind drivers that they are not the only ones using the roads. Feels that drivers think that since they have the largest vehicle, they own the road

Person no. 6

- A 36 year old male engineer who lives in Hlíðar. He recently started his own business but prior to that he worked on Grensásvegur, Skeifan
- Is a member in the national cyclist association and quite the cycle enthusiast, he uses his bicycle for travels as well as participating in cycle contests, and therefore feels the need to cycle powerfully
- His main travel mode is a bicycle and his own car, rarely takes the bus since the marginal cost is almost the same as driving his own car. Since his prior workplace was only 2, 5 km away it hardly mattered whether he cycled or drove; it took about the same time, so he usually cycled unless he had reasons not to (such as having to wear a suit on some days). Also uses his bicycle to shop and run other errands.
- Feels that the route he travelled to work alongside Miklabraut could use some improvements, especially on the intersection with Kringlumýrarbraut (which according to him is not built to make cycling a desired option, and are nowhere to be found elsewhere in Scandinavia). He calls the path alongside Miklabraut which is meant for bicycles and pedestrians a “recreational path”, which has blind spots and exits for cars, as well as a lot of twists and turns and curbs. An unattractive route, although the north side is better than the south side. He also feels the 2, 5 km he had to ride to work was too short for him, he considers cycling exercise, but this is mainly because he is a recreational rider as well. Where he used to go to school he had to ride about 8 km and could then use the gym accommodations to change clothes
- Thinks the Hlíðar area is well located concerning transportation, close to the city.
- In the Hlíðar area there are a lot of one way streets (where bicycles have no exception) which he finds bothersome, the national bicycle association has been trying to get authorities to change this and get an exception for bicycles, to allow them to go both ways on one-way streets, although this also causing risks since drivers only expect one way traffic when coming out of their driveways in these streets
- Feels that bicycles do not belong on sidewalks, due to a large difference in cycling speed and walking speed, as well as the sidewalks being annoying to cycle on (especially those where they have stone tiles) having to go up and down the curbs and following turns to cross crossings

- Thinks the cycle lane along Langahlíð is a mistake, since it's purpose of creating a safe route for cyclists is not fulfilled, with all the crossing streets along it
- Also says that crosswalks are poorly designed here in Reykjavík, since they create an illusion for the driver, when a cyclist is riding on the sidewalks, even though he is going straight, he has to turn right first to be able to cross the crosswalk, so the driver thinks he is turning right even though he is not
- Hopes that the report Reykjavíkurborg has had made on cycle path design instructions will be used on future projects
- Is not very familiar with the cycle city plan, but has seen it. Feels that the map Reykjavík has published is more of a description on how those in charge would like things to be rather than showing how they really are
- Contemplates that the Reykjavík area is not as windy as it was
- Thinks drivers are becoming more considerate towards cyclists on the streets.
- Likes the cycle marks on the streets, says it gives cyclists confidence to cycle on the streets, and when a cyclist has started to cycle on the street he continues to do so since it is far more convenient, and with that we get more cyclists on the streets and that gives us "safety in numbers". You are a lot safer where drivers can see you than up on the sidewalks where they don't notice you. Looking at statistics there are very few accidents where cyclists are hit from behind, most accidents happen in turns, where cars need to cross cycle paths or sidewalks. Drivers are trained to look for cars on the streets, so if you cycle there the drivers will notice you.
- Does not feel it is very important to add more cycle paths, unless they are really needed such as high speed/high traffic streets, such as alongside Miklabraut where the paths are not good, especially along the Hlíðar area. Also where there are steep hills there should be special cycle lanes since you cannot cycle as fast uphill
- Since he is such an experienced rider he feels safe cycling on the streets alongside cars and does not need special cycle lanes to feel safe. But understands the need for special bicycle facilities in order to increase cycling among inexperienced cyclists
- When talking about cycle lanes in street level he mentions that they have to be stationed correctly, not along gutters and too close to curbs or parking spaces. Many accidents happen when cycle lanes are adjacent to curbside parking, when drivers open their doors to get out. Not needed in low speed neighborhood streets
- His motivations for cycling are that it is good exercise, as well as it being economical especially with the oil prices rising every day. He also does not get stuck in traffic. You are also able to bend the traffic laws more when you cycle, like cycling on the street and then getting up on the sidewalk to make a turn at a red light.

- Also mentions that during the winter when there is lots of snow (like there has been here in Reykjavík) the snow plows start by plowing one lane and then everybody should be entitled to use that lane since it is the only road available, cars, cycles and pedestrians alike.
- Downsides to cycling is that the weather is often appalling, as well as poorly lit cyclists
- He thinks that cyclists belong on low speed streets (under 50 km/h) and not on sidewalks

Person no. 7

- A 55 year old female, staff manager, who lives in Breiðholt and works in Hlíðar
- Cycles almost every day of the year, around 16-20 km each day (to and from work), except when the cycle paths are impassable due to heavy snow (as recently). Otherwise she takes the bus but her household has access to a car. Has done this since 2007 when she bought a bicycle.
- Cycles mostly on the cycle paths and sidewalks in Elliðarárdalur and Fossvogur, but needs to cycle on the street to get to the cycle path in Fossvogsdalur. Takes a longer route home, since she likes to cleanse her mind from the hectic and stressful workday before coming home.
- Has read through the Reykjavík city cycle plan but would rather see things in action and not just read about it. Is not content with the way things have been especially during this winter with all the snow not being cleared from the cycle paths.
- Is excited about the new path to Mosfellsbær. Would like to see cycle paths being built at the same time as other road network in newly built neighborhoods, which would encourage young people who live in these neighborhoods to cycle.
- Feels that cycle paths should be separate from car traffic whilst the city is still quite new to the idea of people using bicycles as transportation. When the bicycle's status has been established then cyclists could move out onto the streets. Although, she feels drivers are more aware of cyclists in traffic (and are more considerate) now than before
- Her motivation to start cycling was the cycle to work challenge in 2007 and soon after she got rid of the car, she felt good cycling and continued
- The benefits of cycling is the freedom it gives you, you can quickly cycle from work to downtown Reykjavík and you don't need to worry about parking or traffic
- The downsides to cycling are not many, although she feels you do need to have access to a car, to travel around the country, and you also need to own clothing that protects you from the weather.

- Thinks the nicest place to cycle is a circle that goes through Suðurgata (which has a separate bicycle lane), Nauthólsvík and then through Fossvogur, as well as all cycle paths that run along the shore.
- A bad place to cycle is along the Miklabraut, which has many intersections, you always have to stop all the time and there is a lot of traffic and much pollution. She would like to see a bicycle lane there.
- Would without a doubt use separate bicycle lanes in street level, feels safe there

Person no. 8

- A 40 year old male systems analyst, who works in Hafnarfjörður and lives in Breiðholt. Started to cycle 15 years ago but started to cycle to work on a daily basis around 2002. Owns a car, which he uses occasionally, but mostly to travel
- Likes the fact that when you have a challenging and stressful job it's good to be able to unwind on your way home. Also thinks that by cycling to work he is saving money on gas, and time since otherwise he would have to exercise, so he feels that even though it takes him 30 minutes to cycle to work versus the 20 minutes it would take him to drive, he is saving an hour and a half he would otherwise use on exercise.
- It's not a vision for him to be the person who always cycles, everyday. Actually he dislikes the label cyclists get here in Iceland
- His current route to work is 12,4 km one way through the Elliðarárdalur and Fossvogur area.
- He has access to shower facilities and a changing area at work, but the company does not currently have a transportation grant/contract
- Likes the cycle paths in Elliðarárdalur, unless the weather is nice, then it gets too crowded. Although, he dislikes that there is a 2+1 system in favor of pedestrians. He thinks the cycle path in Fossvogur, where they have implemented a 2+1 system in favor of cyclists (with a two way path for cyclists) is very nice
- When he first started cycling he only used the cycle paths and sidewalks and got hit by a car three times. But now he cycles on the street and on cycle paths and feels that cyclists belong on the streets amongst car traffic, since it's better for drivers to be able to see the cyclist all the time (cites a lecture from a man, John Franklin from the UK). He is also in favor of having cycle marks on the street to remind drivers that there might be cyclists on the streets.
- Thinks that drivers have become more considerate towards cyclists, especially when riding with a cycle trailer
- Mentions that the Icelandic traffic laws were altered in '82 when cyclists were "allowed" to cycle on sidewalks and pedestrian crossings

- Would indeed use cycle lanes on car streets, although he says that in for instance Denmark, they are shifting from the idea of separated cycle lanes because this causes many accidents, because the drivers and the cyclists each have their own designated space and therefore do not look out for one another. But when there is enough room for separate bicycle lanes and there are not many intersections on the route it's a good idea to separate the two travel modes
- Is familiar with the city cycle plan, and has both likes and dislikes about it. Is very happy with the cycle bridge that connects Garðabær/Kópavogur and Arnarnes
- Would like to see the bicycle acknowledged as a travel mode among drivers, and that they show more consideration towards cyclists. He would also like to see more and straighter cycle paths that are separated from pedestrians, especially on major routes
- His motivation for cycling is the exercise, the disconnection he gets between home and work life, staying fit, saving money and looking after the environment, as well as it being a fun challenge to always cycle more and faster
- One of the downsides of cycling is that you get labeled as “the guy who cycles” (a negative phrase, but with a touch of admiration)
- He likes to cycle on cycle paths along the shore (Ægissíða, Seltjarnarnes, Mosfellsbær) where there is usually not much traffic, neither cyclists nor pedestrians, and nearly any intersections
- Dislikes all places where you have blind turns, especially around underpasses. He also mentions an intersection on Fálkabakki, Breiðholt
- He feels that a lot of decision making regarding the cycle network is being made by people who do not cycle (but have read about cycling), that the car and drivers have a higher priority than bicycles and cyclists
- Would like to add that he thinks the electric bicycle should be allowed and that cycle paths should be designed with that in mind (e.g. designed for a speed of up to 35 km/h)
- Says that you do have to make an effort when starting to cycle on a regular basis but when you start it only gets better and better with time

Person no. 9

- A 33 year old female who has a Masters Degree, working at UST - The Icelandic Environmental Institute, lives in Hlíðar, has a spouse and three children and owns a car (since November). Cycled to work every day (around 3 kilometers which takes her around 10-15 minutes) before purchasing a car but now mainly during the summer months.

- Her route to work runs along part of Miklabraut and then through a neighborhood and along lightly traveled roads, but she has to cycle on a parking lot the last few hundred meters
- Feels it is dangerous to cycle in her neighborhood (Hlíðar), especially on the bicycle path in Langahlíð which she feels is poorly constructed, with it being on the streets as well as some parts of it up on the sidewalks, she feels it creates a false sense of security. It is also lightly traveled so drivers do not take the time to check for cyclists since there are hardly ever any. There are also many cars parked up on the sidewalk within the neighborhood.
- She cycles both on the street and on cycle paths and sidewalks, and does not feel secure riding on the streets since she often falls down
- She cycles downtown, thinks it is easier than to drive downtown, both because it's quicker and you do not have to search for parking. She also cycles to the grocery stores and to pick her kids up from school.
- Especially likes the underpass on Snorrabraut, on her way downtown, as well as the underpass near the Valur sports center, which allows her children to go there by themselves without having to cross a major traffic street (Bústaðavegur). She also likes to cycle along the seaside to Grafarvogur and near Nauthólsvík
- Bad examples are the traffic lights where you have to press a button twice to get all the way across the intersection, then you have to wait at the center, which many people do not do, instead they cross the street on a red light
- Is familiar with the Reykjavík cycle city plan but has not studied it herself
- Feels there is a need for more bicycle parking all over the city. Would also like to see a longer cycle path all the way down the main shopping street, Laugavegur, since it currently stops after a few hundred meters. Would also prefer more cycle paths all over the city, and feels that cycle paths should be constructed/put where people actually want to cycle instead of planting them alongside the road network, that is they should be planned to facilitate cycling. Where needed, for example where there is not enough room for a separate cycle path they could put cycle lanes on the streets.
- When you cycle on the sidewalks, you always have to ride up and down curbstones
- Would use cycle lanes on the streets, especially when you have more and more cycle lanes, drivers become more aware of cyclists and more careful
- Feels that traffic lights should be changed so they are not on the opposite side of the intersections, to force cars to stay behind their designated lines, so that pedestrians and cyclists can cross the street where they are supposed to
- Grew up with a mom who did not have a driver's license so she is used to cycling everywhere. Advantages to cycling are that it is convenient, it is a much needed

break from traffic, as well as being good for the environment and being economical. Feels she became more uptight and stressed out after they got a car. Feels it is convenient when that she and her spouse can leave at different times for work so that one person drives and the other cycles. Cycling also contributes to her overall wellbeing as well as getting the exercise, even though it does not substitute other exercise, except when cycling longer distances.

- Disadvantages to cycling are that it is hard to be able to get places on time, especially when you need to run errands, such as grocery shopping, on the way. In the winter you can't cycle due to the cycle paths not being cleared of snow and snow from the streets being pushed up to the sidewalks. There is also not a grocery store in the neighborhood, only a small corner shop. Another disadvantage is that you sweat when cycling and therefore need to change clothes which is not always possible, even though her workplace offers shower facilities which many of her co-workers use
- Feels she gets a well needed break when she cycles

Pálmi Freyr Randversson

- Project manager at the division of the Environment at the city of Reykjavík who lives in Garðabær, and works in the city center
- Was in charge of the planning of the city's cycle plan and is now part of planning cycle paths as well as various projects within the central city that encourage a more vivid city life (e.g. allowing only pedestrians on parts of Laugavegur, the central city's main shopping street, which otherwise is open for car traffic).
- Mentions that preliminary results from a very thorough travel survey that was last carried out in 2002 show a large increase in cycling (around 3,5% cycle now, compared to 0,5% in 2002, which is a 700% increase in cyclists). Although it seems that there is a decrease among those who walk, so that walkers have probably become cyclists which is not totally preferable. In this survey people on the Reykjavík and neighbouring areas were asked to document their trips during one day. Thorough results will be published soon.
- All of the city's focus now is on cycling in all transport related issues. Almost all investments towards transportation and city planning go towards cycling (about 90%). About 500 million icelandic kronas are going towards cycle related measures (this not depending on whether or not the (already applied for) ELENA grant coming through or not), whilst 50 million icelandic kronas go towards the car. There is quite a turnaround in focus. They are designing a lot of cycle paths now that just have to go through detailed planning and will after that start construction. A lot will be done this year, as well as a lot having been done the last two years. In one place, in Fossvogur, the cycle path has been separated from the walking path which is the first time that has been done except the small piece of cycle path in Hlíðar and Laugavegur.
- He feels that more people are considering cycling as a true alternative.
- Although it being a delicate issue, he feels we need to corner the car a little more, somewhere parking spaces will need to be removed.
- The 10 km of cycle paths planned to be constructed each year cost around 1000 million icelandic kronas, this including every possible construction, whether it being a completely new path in an open environment or changes in intersections to accommodate the bicycle better. (He also talks more thoroughly about planned measures, e.g. where and how)
- One of the most travelled route is the route along Suðurlandsbraut and Laugardalur and this path is to become a two way path, hopefully this summer.
- The Ægissíðustígur is now a two way path separated from the pavement for pedestrians.

- In the city's cycle plan they talk a lot about propaganda to get people to cycle but they have not done much to fulfill this, mostly by leading a good example as well as partly funding and taking part in the Cycle to work week/month. He talks about Troels Anderssen from Odense, Denmark who had a speech at a conference in September, where he listed Odense's various methods to encourage people to cycle. The city of Reykjavík also hosts a transportation week where they address transport related issues, which the before mentioned conference was part of. The city employees also have green bicycles which they use to run errands around town. They do not offer a driving grant which many companies have to compensate employees for the use of their cars. They do have a transport policy and a transport contract underway which should reward those who choose other methods of transportation than the private car. He feels that a transportation grant should be more than just subsidizing bus fares, that it needs to be a real motivation.
- Drives to work during the winter, cycles as much as he can during the summer, and uses the bus when needed
- Cycles because of the exercise and feels good getting a break from busy life.
- Feels there are many disadvantages in cycling in the city, a lot needs to be fixed but there are also good places. Steep hills are a downside to cycling, car lanes are almost flat but cycle paths go up and down following the topography of the city, this should be the other way around.
- Feels that here in Reykjavík we give the car the advantage, they get a special lane to turn right at intersections but the cyclists have to watch out for cars and need to cross the right turn lane as well. In Odense, Denmark there is a special lane for the cyclists to turn right at intersections. There, the car has to wait.
- It is important for the city to have cyclists on the streets, it gives the city more character as well as improving public health and being good for the environment.

Gísli Marteinn Baldursson

- City councilman in the city of Reykjavík, and elected to serve on a few councils within the city such as city planning council and the city's environment and transportation council, which he feels has become one of the most dominating councils within the city's transportation sector. He started his career in television and in his work there he became more and more interested in city issues. In order to further his knowledge within the city sector he took a Masters degree in Edinburgh called The City, which is a interdisciplinary study about cities and city planning, city culture, transportation and other city related issues.
- "What defines Reykjavík, and we need to cure her/it from is the domination of the private car but that does not mean that no one can drive a car, but rather that a higher percentage cycles, walks and uses public transportation
- The attitude towards parking fees has changed over the last few years, according to a poll "Bílastæðasjóður" carries out once or twice a year, about whether people feel that parking fees are acceptable within the city centre. Maybe six years ago the results were 50/50 but now those who are in favor of parking fees are up to 70-80%. Those who live in the city centre request parking fees, in order to be able to have access to parking near their home.
- Not enough parking spaces is also a relative issue, the schools such as Menntaskólinn í Reykjavík and Kvennaskólinn (who are both stationed in the city centre) hardly ever complain but the schools who have enormous parking areas often complain about not enough parking
- It is his opinion that parking issues are the main factor when trying to alter people's mode choices, in the US it is stated that 99% of all trips end at free parking, and this is probably the case here in Reykjavík. The city owns most of the land used for parking facilities and the city needs to pay for maintenance as well as the land being worth a lot. An Icelandic mathematician, Pawel Bartozcek, has even calculated that the fuel wages and such do not suffice for the building and maintenance of the road network. With this in mind the car is a subsidized travel mode.
- When planning new neighborhoods, Gísli wants to include costs of increased traffic from these neighborhoods in decision making (Vatnsmýri/Úlfarsárdalur). People should also take this into account when deciding where to live, since a large part of people's earnings go toward owning and operating a car
- When designing new central neighborhoods, there are only 0,5 parking spaces per apartment, that means that some apartments have one parking space while others do not have a parking space, which would definitely result in fewer cars. It is much easier to not own a car if you live in the central area of the city, than when you live in the outskirts.

- He says the weather in Reykjavík is not as bad as people like to think, it's milder here than in many parts of the US. The winters here are in a way often milder here than in Copenhagen and Stockholm. The city's topography is also fine, there are not a lot of hills and there are paths along the shoreline that make it easy to cycle, since you maintain sea level. The path along Fossvogsdalur, Öskjuhlíð, Vatnsmýri and Ægissíða was supposed to be a highway in the seventies (sixties) which was never carried out, so that path is great and direct for cyclists.
- He often feels cyclists are too firm on the fact that their bicycle is their car and their feeling that too much effort is put on recreational paths for people who only use their bicycle on the weekend.
- When the path along Ægissíða was doubled (made into a two way path) some cyclists complained and said they would rather have a cycle route along the major road network, which he responded to by asking them if they would be happier if they were cycling next to a highway there (since originally this was supposed to be a highway)
- This is becoming more conventional in city planning, for example when new student housing was built in Fossvogur it was so close to this cycle path in Fossvogur, the planners decided to keep parking spaces at a minimum since if you live there you do not require a car. The same goes for student housing near Háskóli Íslands, where there are only 0,4 parking spaces per apartment.
- In general he feels that the bicycles position is good, it has increased a lot according to the travel survey but he does not feel politicians are entirely to thank for that since the facilities has not improved that much. This is more a question of attitude, the attitude of being in shape, increasing oil prices, and the fact that when people start to cycle (like in challenges such as Cycle to work) they discover what a great travel mode the bicycle is.
- He is of the same opinion as stated on the website Copenhagenize, not to obligate helmet use or use special clothes when cycling, cycling should be easy and convenient
- Here in Reykjavík, cyclists have almost been exempt from obliging to traffic laws since they are so few and there has been general goodwill towards them
- He wrote the city cycle plan along with others and feels /hopes that it has had and will have some effect. He wanted it to be both for propaganda purposes to show people that cycling is fun and good for you and that it makes sense to cycle. He also realized that the system needs such reports to work by.
- Currently a path along Suðurlandsbraut, where many cyclists cycle, especially those from Grafarvogur, is underway and will probably start construction this summer/fall, along with bridges over Elliðarárósa.

- The ideology behind the city cycle plan was on the one hand to make the cycle network in the central city, Vesturbær, Hlíðar and Miðbærinn, denser, which doesn't mean that we put up cycle paths/lanes everywhere but rather we "have thought about how cyclists are supposed to travel everywhere" even though it means that on some streets, with a speed limit of 30 km/h they are supposed to ride on the streets
- Some say that the ideology in cycling should be "If you build it then they will come" but he says he supports measures that don't always have to be expensive. He also wants cycle lanes constructed as in Copenhagen, where the cycle lanes are elevated from street level and then the sidewalk is elevated a little higher than the cycle path/lane.
- Hverfisgata is to be redesigned with cycle lanes at both sides
- Most of the city officials support the aim to increase cycling in the city and those who do not agree don't dare to say so. People have started to talk about measures to reduce car traffic which used to be a delicate issue. In the year of 2011 little was done to fulfill the cycle city plan but this year (2012) a lot is on the agenda.
- In Edinburgh he noticed that at some point a lot of new cycle paths were constructed, mainly cycle lanes, a painted white line on the existing street. Then there wasn't as much of an increase of cyclists as the planners had thought and drivers started parking their cars on the cycle lane and subsequently meter guards thought that it does not matter since there are no cyclists using the cycle lane.
- He is doing everything he can to get increased funding towards cycling.
- He feels that cycling gives you a "sense of place" and that you want to be around people and feel as part of a society and Laugavegur is the street best suited for this, and therefore he wants to put a cycle lane along all of Laugavegur, also so cyclists do not have to stop even though there is a traffic jam. However it's much harder to construct a cycle path/lane on Laugavegur where you have parking spaces and underground plumbing, than the cycle bridge in Elliðarársar.
- Another cycle route he feels is very important is the one connecting Laugardalur and the downtown area, along Borgartún which would be a cycle highway.
- In the revised master plan for the city cycle paths will probably not be marked specially. But there will be aims directed at increasing the share of ecological transportation within the city and the reduction of car traffic.
- He also feels that a cycle route should not bear a special name, it should be a part of the street. "A street is not only for cars"
- They do not use any particular cities as examples in the revised master plan, even though they have taken tours of cities such as Malmö, Helsinki, Berlin and

Barcelona and have gotten introductions on how their master plans were accomplished.

- He thinks the most important part in the master plan, which is valid until 2030, is how we want the city to be like then (in 2030). Do we want a city for cars or are we going to make act and reduce traffic, and with what measures. The most important factor is a denser city.
- The idea with the possible new neighborhood in Vatnsmýri is that “the cycle network is built alongside other construction” and at the new hospital, Landsspítali, area, there are cycle paths right from the start. Everywhere in the area close to the city centre cyclist are taken into account in new constructions.
- There is a huge difference between the two neighborhoods Hlíðar and Breiðholt, and he does not think it is because of a higher education and wealthier people in Hlíðar but rather the fact that people live in Hlíðar [closer to the city] and that if people who live in Breiðholt would move to Hlíðar they too would cycle.
- He started blogging as a propaganda measure. He also took part in making a poster that portrayed how 70 persons could fit into three different travel modes. The city cycle plan was never officially published due to limited funding. The city frequently send out press releases on the subject, even though he would like to see more of advertisements promoting cycling as a smart and economic way transportation mode.
- The city of Reykjavík encourages their own employees to lead a green lifestyle. The city of Reykjavík also gives funding to LHM as well as hosting a transportation week where one day is dedicated to cycling. He feels more should be done in this area, the city would save money if more trips were made by bicycle.
- He feels the most important factor to increase cycling is a denser city, which in turn is a long lasting mission, but at least to stop spreading the city, immediately. Another important factor is the construction of cycle routes, which should be separated from car traffic and pedestrians, they should be solely for cyclists. He would want cycle lanes everywhere but realizes that is not a reachable goal, so he says that at least everywhere cyclists should be thought of and decided where they are supposed to go. A third factor is to remove hindrances (that allow people opposed to cycling to make excuses) putting up cycle parking,
- He mainly cycles but sometimes uses the bus or a private car (which his household possesses). Lives in Vesturbær. He is the leisure cyclist, he does not wear special clothes to cycle, he cycles in a suit with a tie. He feels that cycling is by far the most fun way to travel, as well as you being able to spend your money on other things than the car if you cycle.

- He also feels that if we would apply parking fees on the parking lots at HÍ the travel modes of the city's residents would change a great deal

Dagur B. Eggertsson

- Chairman of the city council in Reykjavík (which is the city's executive board) which handles production plans and such. He is also chairman of the city's transportation council, which makes transportation plans for the whole country. In both these roles he has been considering ways to incorporate a new way of thinking within the transportation sector in general, cycling included.
- He feels that the way of thinking about cycling as transportation has transformed a lot over a short period of time. In Reykjavík, in 1994, they started to construct a couple of hundred kilometers of walking and cycling paths all over the city, mostly considered to be recreational paths that run along beautiful scenery. Then the thought of a special cycle plan was presented with a possibility of separate cycle paths intended as main path and cyclist safety (which has varied between complete separation from pedestrians and the shared space phenomena where all transport modes are supposed to be considerate towards each other), which was then followed through with the city cycle plan approved in 2010. The city cycle plan was supposed to be implemented as soon as possible with various "meanwhile" projects since the whole construction was estimated at around 10.000 millions Icelandic kronas. Cycle related projects currently get more funds than ever.
- "This is not an either or type of matter, you do not solely walk, cycle, drive or use public transportation, you use different [modes of transportation] depending on what you are doing... ..and as soon as you realize that the smoothest system is what really matters"
- Currently each neighborhood is considered as one whole.
- Currently they are considering the best option to connect the different travel modes and with that the relocation of the public transportation from Hlemmur to BSÍ, in order to open up our own Denmark, a flat ground in Vatnsmýri and Kvosinni (the central city) where over 40 thousand workplaces are located and a center of employment participation with a lot of people passing through. The vision is to use smaller electric shuttles to serve the University and central city area efficiently along with buses as well as cycle shelters (cycle parking) and cycle rentals both at the destination and in the connecting areas within the neighborhoods. He believes this would be a breakthrough in the use of bicycles and public transportation within the city. This change is in the works.
- It wasn't until a few years ago that the government was allowed to put funding towards building cycle paths, and they have to be along major roads (built and sustained by the government). This is the first time that funding towards the cycle network is included in the government's budget and in those cases that the cycle

path runs along government funded roads the government participates in its funding with 50%. This creates motivation to build up the cycle network faster.

- The Suðurlandsbraut path to be improved this summer proved to be an important path in the cycle to work challenge. People were asked to document their routes and make comments about its condition and on that path there were large amounts of cycle traffic and a large amount of complaints about its condition.
- An application to the European Investment banks ELENA fund has been submitted and 3.000 millions of that are to be put towards building cycle paths. This would speed up the constructions and enable more constructions to be completed.
- This year will be the first big year in constructions related to the city cycle plan.
- Current plans for Hlíðar and Breiðholt are not specifically finished.
- The first and foremost actions in order to increase the bicycle's modal split is to improve the cycle network, oil prices also contribute to increased cycling along with smaller acts such as the cycle to work challenge. Recently, the importance of getting women to cycle has been noticed. If the woman in the household cycles the man and the children are more likely to cycle but if the man in the household cycles, he usually does so by himself. The city's is looking for ideas to get women to cycle. Then there have been actions such as closing streets from car traffic, which enhances city life.
- He thinks the most important factor to focus on now is the women. Constructions are also important but it is not the same to build something and someone using it.
- Previously the people who cycle the most and often cycle long distances have dominated the policy but this requires a shower facility at work and things like that. But if you think of it as a cycle-bus-cycle system it is more casual, and he thinks the mainstream 80% of people are more inclined to this way of cycling and we need to get these 80% to cycle.
- He mostly walks, since he lives close to work.
- The city has been integrating transportation contracts instead of driving contracts which used to be common.
- He thinks the city cycle plan was a bit too drastic in promoting separation for cyclists, and that a cycle path was not a cycle path unless it was heated and you were not allowed to walk on it. He also thinks it was a bit contradictive in talking about complete separation and then the shared space idea.
- The large walk- and cycle path network is around 400 km.
- The idea and construction of painting lines on streets is a "meanwhile" project.