Sustainable Urban Future of Reykjavik

The Case of Artunshofdi

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Cover: Artunshofdi cape, Reykjavik, Island, photo, Nýr miðbær og Sundabraut (2007)

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It is now gerally accepted that city life and regard for people in city space must have a key role in the planning of cities and built-up areas. Not only has this sector been mismanaged for years, it is also by now realized how caring for people in the city is an impotant key for achieving more lively, safe, sustainable and healthy cities, all goals of crucial importance in the 21´st century

Jan Gehl, 2010, preface by author

PREFACE

As a student coming from Iceland, a student that has lived in Denmark for 6 years, the urge to tackle an Icelandic project has pushed me into this study. Though all theories are highly international the empirical section is in need of a person that can interrelate itself to the localities and the mindset of the inhabitants of the city. It is my passions to analyze the urban area and saga of Reykjavík, with the aim to cast some light on the underlying driving forces of its urban development.

In 1997 I graduated as a construction painter. I finished my Bachelor of Engineering in 2010 in Denmark and first in my MSc program at DTU I followed my growing interest in urban planning and urban development. The importance of the practice is vast and ever growing as the international society gets more complex and advanced.

The way cities are planned and developed has changed dramatically throughout the world development history. The planning practice has as well gone through several different eras. These eras the history has revealed to the modern planning practice and by looking back planners of today can get vital information of what can and should be utilized in modern practice and what should be avoided. Additionally, as the modern society is getting more open and transparent, practitioners can get crucial information by looking at the different approaches and methods used by the highly diverse societies of the world.

It is now generally accepted that inhabitants play important roles in the urban development of their own habitats. What differentiates good modern planner from others is their willingness to use local knowledge in combination with their international understanding and acquaintance. Modern urban planners are often in a role of conciliator as influential forces of the societies are strong. Planners thus provide the glue that holds the pillars of the society together and make the living among those durable for the general public.

It is my humble hope that the following study can help the society of Reykjavik to understand its existence and the vital role that the urban planning practice has. This study has broadened my mind for the urban planning practice of Reykjavik and is my modest contribution to Reykjavik urban development at the start of the 21st century.

Three people in particular have made the writing of this document possible and helped make the process more pleasant. Firstly it was my supervisor Morten Elle, then my girlfriend Ragna Kristín Gunnarsdóttir and last but not the least my daughter Brynja Karen Hjaltested. My two girls have given me endless moral support and urged me to keep on going and “tricked” me into much needed daily and weekly breaks. My supervisor has been highly generous of his time and through our meetings he contributed greatly to my intellectual development. He taught me to appreciate the urban development practice and also making the writing process an enjoyable experience. .

I am especially grateful to Hrólfur Jónsson, director of public work at The City of Reykjavik as he has, with his cheerful manner, helped me from the first e-mail I sent him, both through conversations and in his general interest in the project. Additionally I am extremely grateful to Trausti Valsson, urban planner and professor of planning at the University of Iceland and Haraldur Sigurðsson, planner and head of the urban planning department at The City of Reykjavik as they contributed to the project with their insights and unconditional help.

My interviewees, Halldór Eyjólfsson and Gunnar H. Gunnarsson also have my gratitude along with Katrín Halldórsdóttir as her e-mails cheered me up and supported the working process. I also could

not leave out Baldur Halldórsson as our conversations, that could get quite windy, facilitated the process. In addition Atli Örn Hafsteinsson gets thanks for all his support during our academic years in Denmark.

Lastly I would like to thank my friends and family in Iceland for their understanding, patience and tolerance for my low profile these last six months and lack of returning phone calls. For my parents and siblings this document marks the end of my 6 years exile and the start of my return home.

SOCIETAL CHANGES

The first “buildings” in Iceland were “turf houses”. Turf houses were mostly made of turf with a framework of rock or wood. The last turf house in Reykjavik was demolished when it’s resident passed away in 1980. My grandmother on my mother side was raised in a house where the floors were made of humus. This is an example of the huge and abrupt changes that have occurred in Reykjavik. It´s not long since Reykjavik was an unhabited field. Here is my history of the societal changes and urban development that pushed me into this study.

About fifty years ago my father was a young boy who lived with his parents in the outskirt of the municipality. There my grandparents raised their six children in an environment that was quite different from what it is today. From the windows of the house (a house where four families lived) you could see uncultivated open fields. A few houses down the street there was a little farm and dairy shop where his dairy products were bought (my father´s sisters were also able to purchase cow urine there, as it was supposed to be good for a young girls hair at that time, but that is another story). They did not have much money so during the summertime some of the children (my father included, at the age of 12) were sent (scattered) to the countryside to spend the summers there. Some summers the whole family took to the family´s “summerhouse”, a little minimalistic shed of approximate 30 square meters, also located in the countryside but only a one hour drive away from their apartment in the city. There, it was cheaper to live and there, the family could get much of they needed by living off the land. My grandfather worked in a fertilizer (established in 1954) factory that was located in the countryside, approx 40 minutes driving length from the apartment in the city. When my father grew up and started a family of his own he was lucky enough that my grandfather had worked himself up the social hierarchy of Reykjavik’s society just enough so that my father could be sent to the director of the bank and get a loan for the first apartment because of the family name. To get a loan at that time one had to order a meeting with the bank director and that was hard to get if no previous relationship existed. When at the office one had to describe how the money would be spent in details and almost plead or beg for a loan. My parents belonged to the working class, both got an education and as such we lived a good life, there was money to buy all the necessities of life but nothing more. It was a good life for me and my older brother. We lived in an ever growing neighborhood, with much open space and closeness to the nature where many of our family members also lived and were also close to both our grandparents. Both my grandparent’s house and the school were within walking distance. There was one car in the household and it was used by the parent that needed it the most at any given time. Often my mother took the public transport, bus, to work. My mother, like her mother, my grandmother, worked in a bank and when my father got a job at the fertilizer factory he often took the bus, provided by the factory, as then about 20 years later, thanks to improved transportation facilities, the fertilizer plant was in 20 minutes driving distance away. At this time it was not bad to have a family member to help you to get a job and thus both of my parents worked where their parents were working. It has always been a custom for Icelanders to work and work hard. For me and my brother and our little sister it has always been a custom to work hard during the summers. First it was to get a little extra money to spend and then to pay for education, travelling or transportation (though in most cases with good support from our parents). It is a custom that children start to take summer jobs founded by the municipality at the age of 14. I remember when my brother got his first summer job. Then it was possible to get a little more money doing the same job but just

founded by the Church. He got this job because my grandfather knew someone that could help him along. Later on my brother also got a summer job at the fertilizer factory and then at least 10 family members were working there. This was about 15 years ago. Our neighborhood was changing, all farming, both domestic and vegetation had ceased and the neighborhood was getting engulfed by the sprawl of the city. When the fertilizer plant was closed around the year 2000 I lived with my parents and my younger sister at the same place that my grandfather and my father did before (my parents bought the apartment when my grandparents moved to a smaller place). Today my parents still live there and when I visit them and look out of the very same window that my grandfather did 50 years before I cannot see the same vision that he did. Now the main highway, Miklabraut road, with all its cars flashes for my eyes and there the uncultivated open fields my father as young kid used to play in has been substituted by 4 story buildings. In 2000 when the fertilizer factory stopped its production it took about 10 minutes to drive to the factory as now it was no longer in the countryside but well inside the city boarders. Last year my family was forced to tear down the old summerhouse my grandfather had built as it now was in the way of modern houses that wanted to get access to the lake that earlier had provided food for my family during rough times. It now takes about 15 minutes to drive from my parent's house to the place where the little shed stood a trip that used to take an hour. My parents built their own summerhouse in the countryside where my father had spent many of his previous summers. This was about 20 years ago, and at that time the average driving length was about 3 hours, now it is one hour and fifteen minutes away. I hope the city will never reach that cabin.

This story is only told to show how vast the urban sprawl of the city has been in only a few years. It is also an indicator of how underlying forces in the society can affect the citizens as this story is not unique. My family has not gotten the short end of the stick, we have had great life that has only improved during the years. This is to shed a light on the morale that often can characterize small town living, which Reykjavik actually is, although it prides itself of being a modern capital.

ABSTRACT

This is a study of the growth and urban development of the northernmost capital of the world, Reykjavik. The research focuses both on the theoretical background of Reykjavik's development as well as the actual physical growth of the city. A prognosis for the city´s future development is held out as well as an analysis of one of the main growth opportunities. A case study will thus be conducted for a relatively large area called Artunshofdi cape. This area shall be re-designed and re-built in the near future and its central location inside the city makes the success of the project vital.

As a young city Reykjavik has gone through majority process where its major actors, the general public, authorities, politicians and investors have had a hard time getting along. In the economic boom following World War II the society has facilitated the usage of the private car to the extent that an effective public transportation is not to be found and the visions of compact city living with its benefits are all but forgotten.

With new emphasis in its urban development practice and sustainability, the city authorities are responding to the global call out for the urban areas to shoulder their share in improving the global living. This study reveals that Reykjavik has made good progress in "mapping" its effect and marked a clear goal for the future. What is now needed is to improve the relations between the already mentioned actors so that the wheels of the society can start to spin again. In the wake of crisis times many possibilities emerge and the re-birth of Artunhofdi cape is one of them.

By tracing both the theoretical- and empirical saga of Reykjavik municipality and through analyzing the Artunshofdi cape area the author contributes to the "sustainable urban future of Reykjavik" by unfolding its transportation pattern of automobile dependency and the underlying forces behind the urban development of the city.

The main findings are that the Artunshofdi cape can be used as a showcase to show the urban actors that much is to be gained by taking sustainable measurements. Sustainability will though not be gained in Reykjavik municipality like the way things are heading now. A new land-use strategy is needed and not only for Reykjavik municipality but a collective one for the whole Great Capital Area that Reykjavik is part of so that sustainability can ever be gained. Only by facilitating merger of the eight municipalities in the Great Capital Area a sensible collective land-use strategy can be made. Reykjavik and the Great Capital Area is in a need of stopping sprawl, intensify the built area, design new public transportation system (bus, metro, tram, train) and tidying up in the authorities body. The area is thus in a need of a guiding hand and that hand should be a governmental one. The Icelandic State should intervene and lead or demand merger of the eight municipalities as only when that has been done a new land-use strategy can be made and outworn visions will be re-shaped and then the true quest for less automobile dependency and more sustainability can begin in Reykjavik.

RESUMÉ

Denne rapport omhandler et studie af vækst og byudvikling i den nordligste hovedstad i verden, Reykjavik. Forskningen fokuserer både på den teoretiske baggrund for udviklingen i Reykjavik såvel som den aktuelle fysiske vækst i byen. En prognose for byens fremtidige udvikling er udført samt en analyse af en af de vigtigste vækstmuligheder. Et casestudie vil således blive gennemført for et relativt stort område, nemlig Artunshofdi klippe. Dette område skal være re-designet og ombygget i den nærmeste fremtid og dens centrale placering inde i byen gør projektets succes vital.

Som en ung by, har Reykjavik været igennem udvikling forløb, hvor dens hovedaktører, offentligheden, myndigheder, politikere og investorer har haft svært ved at komme overens. I det økonomiske boom efter Anden Verdenskrig, har samfundet fremmet brugen af privat bil i det omfang, at effektiv offentlig transport ikke er at finde, og visionerne om den kompakte by med dens tilhørende fordele er for længst glemte.

Med ny vægt i sin byudviklingspraksis og bæredygtighed, reagerer byens myndigheder på den globale opfordring til byområderne til at påtage sig deres del i at forbedre de globale omgivelser og samfund. Dette studie viser, at Reykjavik har gjort gode fremskridt i kortlægningen af dens virkning og viste et klart mål for fremtiden. Der er nu behov for at forbedre forholdet mellem de allerede nævnte aktører, således at hjulene i samfundet kan begynde at spinde igen. Mange muligheder opstår i kølvandet på krisen, og genfødsel af Artunhofdi klippe er en af dem.

Ved at spore både teoretisk- og empirisk baggrund af Reykjavik Kommune og ved at analysere Artunshofdi klippe området, bidrager forfatteren til ”den bæredygtige fremtid i Reykjavik” ved at udfolde byens transportmønster mht. afhængigheden af bilen og de underliggende kræfter bag udviklingen af byen.

De vigtigste konklusioner er, at Artunshofdi klippe området kan bruges som et showcase til at vise de forskellige aktører, hvor vigtigt det er at tage bæredygtige målinger. Bæredygtighed vil dog ikke blive opnået i Reykjavik Kommune, som det ser ud til på nuværende tidspunkt. En ny arealanvendelsesstrategi er nødvendig og ikke kun for Reykjavik Kommune, men en kollektiv strategi for hele hovedstadsområdet, som Reykjavik er en del af, således at bæredygtigheden nogensinde kan opnås. Kun ved at lette sammenlægningen af de otte kommuner i det store hovedstadsområde, kan en fornuftig samlet arealanvendelsesstrategi opnås. I Reykjavik og hovedstadsområdet er der behov for at stoppe udbredelse, intensivere bebyggede områder, etablere nye offentlige transportsystemer (bus, metro, sporvogn, tog) og rydde op i myndighedernes krop. Området har således et behov for et ledende hånd, og denne skal være statslig. Den islandske stat bør gribe ind og lede eller kræve sammenlægning af de otte kommuner, hvor kun når dette er gjort, kan en ny arealanvendelsesstrategi opnås og udslidte visioner vil blive omformuleret. Derefter kan sande søgen efter mindre afhængighed af bil og mere bæredygtighed begynde i Reykjavik.

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INTRODUCTION

Modern societies are growing and over half of the world's population - which is about seven billion - now lives in urban areas. This large and growing number of global inhabitants and its increasing portion living in urban areas calls for the application of the concept of sustainability because urban living today, is largely dependent on outside resources and energy. Urban areas need to become more self-reliant. Planning of urban areas until now has put little focus on resource use and pollution minimization and the use of recycling cycles to help with this task. In this context, it can be stated that rural living in most cases has been sustainable in history. Some cities like e.g. Reykjavik were self-sufficient in most respects until about 1900. A study of modern cities will explain l in how unsustainable ways most urban areas of the world are evolving.

Because of its subjectivity it is hard to define sustainable development or, in general, the concept sustainability. Many attempts have been made though:

> *"Sustainable development is development that meets the needs of the present without compromising the ability of future generation to meet their own needs."* (Our Common Future, 1987)
>
> *"Sustainable development is development that improves the long-term health of human and ecological systems."* (Wheeler, 2004)
>
> *"The idea of sustainable development is characterized in part by the aim of not putting more stress on the environment than it can take, be it water, air or vegetation. Even the social and economic environments are planned with this idea in mind."* (Valsson, 2003)

The principles of sustainability are open for everyone to interpret, but the most common interpretation is that sustainability is gained by confluence of three to four constituent elements, i.e. the elements of environment, society, economy and, to some extent, also culture. Only when all the mentioned elements are combined and in balance, the true purpose of sustainability is gained. As such, the principles of sustainability are as appropriate in the various urban areas of Iceland as in the dense urban areas of Asia and America.

With the Industrial Revolution, starting in the 18th century and lasting until the 19th century, the modern cities started to take their shape. This revolution started in the United Kingdom and slowly spread across Europe and America. Parallel to this evolution of the modern cities many problems and questions emerged, concerning e.g. health and human rights.

Based on these problems, many reform theories also emerged and these led to the rise of the field of modern urban planning. It was not until 1921 though that the first Icelandic planning law was approved by the Icelandic Parliament. This was followed up on in 1927 with the publication of the first Icelandic Master Plan, i.e. a Master Plan for the capital, Reykjavik. The shift from rural living to urbanization took about 100 years in Iceland and at the end of the twentieth century 90% of the Icelandic population where living in towns and cities. (Valsson, 2003)

It is obvious that this change in living pattern in Iceland has occurred in a rather short period of time. Unfortunately the planning practice has not been able to keep up to this vast development of the Icelandic community. At the start of the 21th century the academic study in planning, architecture and landscape architecture still hardly exists in the educational system. As it is in the nature of Iceland as a fast growing nation, the planning practice out in the field has developed at a high-speed over a short period of time.

Now an understanding of the need to put more emphasis on city planning at an academic level is growing. Along with this the acceptance of the vitality of the principles of sustainability is growing in this country that has historical roots that run deep in close conjunction with Iceland's natural environment.

These current actualities and interests have lead to the subject of this MS-study and triggered the curiosity of the writer. The purpose is to get more familiar with today's planning principles of Reykjavik, as well as the general principle of sustainability. This thesis is therefore conducted to give the writer and hopefully the reader as well more fundamental learning of the theories and principles that are used in the arena of city planning. It is the hope and sincere intention of the writer to further his own education and that this knowledge will follow him in his profession later on and hopefully be of further assistance to the urban development of Reykjavik.

Project formulation

The main theme of the study will be to come to grips with the concept of sustainability. There will be an observation j at how area usage, urban structure, transportation, culture and administration can affect a city outcome in a world that calls out for more sustainability. Reykjavík is a city with great possibilities concerning its urban development. The city and its government are already on the path of learning how sustainability can be applied in a city where climate and old thinking, sets its marks on the way things are done. The vast growth of the city as well as its geographical circumstances has raised some new and serious questions concerning the urban development of the municipality, questions that not many cities are confronting today. The main question that this study is intended to answer is this:

How can a new land-use strategy in Reykjavik re-shape outworn visions and create new transportation possibilities that lead to less automobile dependency and more sustainability of the society?

Along the way more questions will emerge and attempts will be made to answer them at their arrival. These are questions like: Where is the true City Centre? Should it be moved? Where is the heart of the city beating? And is it possible to relocate a/the City Centre?

The origin of these questions is from the almost entirely horizontal, low-rise low-density urban development of the Reykjavik area, along a narrow axis of some 20 kilometers. The Capital Area has stretched its boundaries further and further each year in the quest of finding new lands for its inhabitants. The inhabitant's ever-growing interest to move to the suburbs until the Crash of 2008 to a single apartment house, preferable with a green garden on all sides and a panoramic mountain view has shaped this development. Everyone's dream used to be to live on that hill top where you have the freedom of choosing the degree of social relations between you and your neighbors.

In one way or another, the mindset of Icelanders has been corrupted through the years – in the view of the author of this thesis - by a wrong vision on life. All too many share the thought that you are not living your life to its full potentials by living in an apartment house with one car per household, it signals your financial status and that has implanted this wrong way of thinking in the mindset of most Icelanders. After the Crash in 2008 this has started to change dramatically. Now very few ask for lots in the suburbs, and at the same time the demand for flats in Old Reykjavik is growing.

This horizontal urban development of Reykjavik has increased the car dependency and it is not uncommon that there are three cars in a household, and in most cases not fewer than two. At only 17 years of age (this will be changed to 18) you are allowed to drive a car in Iceland. It symbolizes

a great shift in juvenile freedom to have a driver's license and it marks an end of an era of dependency on bad public transportation system for many.

Bicycling is not considered an option in Reykjavik or Iceland as a whole and bicycles are almost only used for recreational purposes (There has, though, been increased awareness in these matters the last 10 years). For many, the weather inhibits cycling, for some the lack of bicycle paths and for others the geographical shape of the land. Because of this, a culture for bicycling hardly exists in Reykjavik or it has not gotten the ability to develop in right manner.

It can be stated that the horizontal development has made the structure and the infrastructure of the many districts of Reykjavik highly Americanized. It can be seen e.g. In the shopping patterns of the inhabitants and the vast area that is used for parking spaces in the city. Shops and grocery stores are in most cases clustered in rather large units at one place, surrounded with a large parking space. For inhabitants, parking of cars is in most cases few meters from the front doors of their houses, schools or workplaces. This pattern undermines the social part of shopping and going about in the city and allows people to develop a pattern that is highly car dependent, unsocial and unsustainable.

There are not many signs of European influences in the newer neighborhoods of Reykjavik. A planning style where the shops and services are small, close to your home, where the local environment encourages you to walk or take the bike is not to been seen. Jan Gehls theories of "life between buildings" does not get to flourish in Reykjavik now a days and thus the rich culture of Icelanders as an open and warm nation is neglected and not given the right acknowledgement in the planning practice.

Iceland and the Capital Area are rich in nature, open land and cheap power sources and that's the way it has always been and Icelanders are used to having it. The last almost whole century of urban planning practice has not shown these sources the right respect and most certainly has not made the nation more sustainable in thinking. The trends in urban development has been to expand the city area instead of looking inward and support, rebuild, rethink and nourish the infrastructure, brown fields and green areas that are the glue that hold the city together . In short: The Icelandic nation has grown from its origin as a very sustainable nation to a nation that is highly unsustainable in many ways.

Artunshofdi cape is one of Reykjavik's large areas that are going to be re-planned and re-developed in the near future. The development of this area is though, dependent and under a great influence of the holistic urban development of Reykjavik. This project will thus study what characteristics and features the Artunshofdi cape has, or could have in the future, if the area is to serve as a part of a new sustainable city. Answers will also been given to questions like, what role could this area play in Reykjavik's quest for more sustainability or if this area could be a key area to opening up the minds of Reykjavik's inhabitants to the concept of sustainability or a more greener way of living.

It is also the aim of the writer to research what changes are needed so that this district, Artunshofdi cape, can be considered sustainable. To achieve this, both physical and social changes in the area itself are needed, as well as in the whole urban planning of Reykjavik, and the Capital Area. Reykjavik is in a need of a shift in the mindset of its inhabitants as well as of the Government.

The Artunshofdi area will thus be used in this study as a core area to discuss the urban development of Reykjavik as concerns a more sustainable future. Reykjavik, its democracy and saga will be studied in the quest of drawing some lessons from it. The goal is to earn the writer some fundamental learning inside the field of urban development and planning practice and alongside try

to answer questions like: How can Reykjavik develop in more sustainable manner? What learning can be drawn from Reykjavik urban planning practice in the last century? And how can the mindsets of the people of Reykjavík be turned into a more positive one concerning the principles of sustainability?

Reading guidance

The first section, the theoretical part of the thesis is to list up and define the fundamental theoretical knowledge behind the main subject, sustainability and sustainable planning. This section serves as a learning process for the writer where the main aim is to make a theoretical background for the study to support the discussion and conclusion.

The second section, the empirical section, will focus primarily on the geographical location of the study. Iceland and its capital, Reykjavik, will be analyzed as well as the Artunshofdi area with the purpose of shedding some lights on its past urban planning practices and its urban development. To get a comparison to the current situation in Reykjavík some foreign examples, i.e. case studies will be looked at. The main purpose of the case studies is to look at what have been the traditions and trends concerning sustainability in other cities around the world in the hope of drawing some lessons from these.

In the discussion section the first two sections will be discussed and the learning that can be taken from them. It will try to give guidance for the future urban development of the Artunshofdi area, so that the area can be rebuilt in a sustainable manner that will fit the hopefully more sustainable urban planning practice of Reykjavík City.

A study of sustainability and urban planning practice is becoming a continual process in all urban areas, a process that has to be kept at the forefront at all times. The conclusion of this study will therefore be more on my own work during the project work and a conclusive one for the subject. In its final section the thesis will thus include a perspective paragraph where speculation about following research fields are discussed and a summary on the things that were decided to be ruled out of the study.

2 THEORETICAL SECTION

> *"Depending on your perspective, planning theory is either the marginalized preoccupation of a few professors or the engine that drives renewal of planning practice through reflection and the generation of new ideas. Truth probably lies somewhere in between. Some planning theories neither stimulate action nor describe it effectively. Much of what planners do today reflects their understanding of practice and their aspirations as molded by the planning theories they have read or heard about, or by the ideas of others which, in turn, were molded by theories"* [Stiftel, 2000, p.4]

The first steps for urban planning as a practice was made thousands of years ago. However, urban planning as a concept like we know it for today has only existed for about 200 years. (Hodge & Robinson, 2002) The profession of planning is said to emerge out of series of crises and peoples responses to them. One of the main crises in the urban history is the Industrial Revolution (1750-1850) as it brought upon cities and the workers social and health degradations in the form of overcrowding, contamination and inhuman and almost unlivable conditions. (Legates and Stout, 2000) According to Hall (2002) and Hodge & Robinson (2002) the conventional starting point of urban planning as a practice is commonly said to have its origin in the late industrial revolution, i.e. it was first during the second half of the 19th century (first in Europe and then in north America) that the need for the concept emerged. The industrialization created great inequalities in living conditions that had to be met and challenged. At that time cities were getting more and more polluted and became centers of social ills Langdon (1994) and thus those who could afford it moved out of the cities, creating the first suburbs and taking the first steps of urban sprawl that has challenged the urban planning practice ever since though mainly in the late 20th century and now at the beginning of the 21st. The urban planning practice evolved throughout the 20th century with, in many cases, the development of the car as a spear. This lead to huge variation of urban forms that in many cases disregarded the impact upon the environment and, in the end, left the scenario of the 21st century a dark one. (Dennis and Urry, 2009) Now there is emerging a new culture or a scenario that takes the humans back to the cities that they once ran out of or left reluctantly. A common platform for communicating in global matters is emerging in form of sustainability. Through this platform, a return to the real urban living is getting realistic, an urban living that is very much vital for the human as a living being and social species.

In a global context Reykjavik's debut in urban development came late and the first development steps were slow and cautious. Reykjavik was at first under the wing of Denmark and as such its early development steps were highly influenced by the development practice that prevailed in north Europe. Under the occupation of the American army during World War II Reykjavik seems to have been influenced by the urban development practice of America. A mixture of European and American urban development practice thus prevailed the years after World War II. Car usage and ownership in Reykjavik boomed after the war and it has lead to the American planning practice becoming the prime model in the late 20th century. The planning practices have then supported this pervasive car orientation of the society by constantly facilitating the car and its status as the "prime" mode of transport. About 25 years ago, new concept emerged that challenged this promotion and admiration of the car and its associated system. With this concept, sustainability, as a weapon the existing planning practice in Reykjavik is getting its redemption and is finally seeking back to its European roots (see Empirical section).

These changes in the theoretical background of the planning practice of Reykjavik's urban development will be the backbone of this section. The theoretical section will thus not be a

traditional one, but instead be one that can be used when the following, empirical section will be analyzed and discussed.

There will thus be looked at different movements, visions and concepts that has emerged in the theoretical background of urban planning practice on both side of the Atlantic Ocean (Europe and America) since the Industrial Revolution. These visions emerging from the post industrialization are considered as being central to the issue of this paper i.e. the way Reykjavik has developed.

> *"At the turn of the twentieth century there were no standards concerning what a city planner was or what he or she should do. By World War II, planning had become a recognized profession"* (Legates and Stout, 2000, p.304)

2.1 Post industrial visions, movements and utopias

Shelters and clusters of dwellings were the first "urban" settlements. These were highly constrained by natural features e.g. wetlands, forests, rivers, hills, cliffs and valleys. These first settlements were mainly simple tribal communities that were then followed by villages that were linked to each other by pathways. These early villages were initially based around agricultural production and domestication of animals and grew to be located at intersections of transportation routes (e.g. along major rivers) or market places where trade could be made. At this time the foundation for cities as complex social, economic, religious and political systems were emerging and the first cities are said to have existed in Mesopotamian, Egypt. In these early cities writing began, pottery and metallurgy. Since then, through the build up of Athens and Rome, during the long period of medieval urbanization of Europe, the build up of London and Paris, cities spread across the globe and grew into cradles of civilization. Up to the Industrial Revolution mankind surged forward with its rapid population growth and that period started a shift between rural and urban living. (Legates and Stout, 2007). During the Industrial Revolution people flocked to the cities as the shift or transition from manual labor and agricultural based economy towards machine based manufacturing occurred. This early period represented a profound transition in the history of technology, economy, religion, and social life and the emergence of the urban civilization as we know it for today. (Legates and Stout, 2007) It is there this papers study begins, in the wake of the Industrial Revolution where people were *"forced to sacrifice the best qualities of their human nature"* (Engels, 1845, p.52). It begins where people were being forced out of these hell holes that the industrial cities turned out to be, it is there where the rise of the utopia writings starts, where men of visions started to try healing the ills and change the errors that the Industrial Revolution did to the urban environment.

The following historical visions, movements and concepts are all a part of a complex background of the modern urban planning and their originators are considered as the legends of urban development scholars and practitioners. (Legates and Stout, 2007) They mark thus the foundation for the modern comprehension of sustainability and only by studying their work the modern urban theories can fully been understood. A study of few originators will be conducted as they are considered to be essential; each in their own way, for this paper's study and the way Reykjavik has developed. These historical events though according to Hall (2002, p.5) *"stubbornly refuse to follow a neat chronological sequence and do not submit to any schematic ordering either"*. To do an analysis or to pick out few visions to analyze at both side of the Atlantic Ocean at the same time one has to *"criss-cross in a thoroughly disorderly and confusing way"*. Despite that, a timeline will try to be created, though it sometimes can seem quite vague.

2.1.1 Fredrick Law Olmsted's Urban parks movement

One of the first pioneers to face the pollution problem that the industrial cities gave to its inhabitants appeared in America and was called Fredrik Law Olmsted (1822-1930). During his lifetime, Olmsted was a writer that later became a landscape architect that had the social, political and cultural concerns as a driving force. Olmsted Urban parks movement was about giving the cities "lounges" that should improve the poor health of the inhabitants and giving the inhabitants a place to maintain a temperate, good-natured, and healthy state of mind. (Olmsted, 1870)

> *"It has shown, for example, that under ordinary circumstances, in the interior parts of large and closely built towns, a given quantity of air contains considerably less of the elements which we require to receive through the lungs than the air of the country or even of the outer and more open parts of a town, and that instead of them it carries into the lungs highly corrupt and irritating matters, the action of which tends strongly to vitiate all our sources of vigor … and if we had no relief from it [the crowded streets] at all during our waking hours, we should all be conscious of suffering from it"* (Olmsted, 1870, p.308-309)

Figure 2-1: New York Central park designed by Frederic Law Olmsted (Columbia University)

Although Olmsted's prime monument is his design of New York, Central Park (1863) not all of his ideas were of such magnificent sort. Many of his ideas were like those of Danish urban developer Jan Gehl of giving the streets back to the general public and making the life between the buildings more welcoming in form of more greenery and less traditional urban forms. Small, green parks and squares where the inhabitants can freely play, relax and express themselves in the company of others should according to Olmsted (1870) be not more than a few minutes' walk from each home and as such the parks should be an integrated part (preferably connected with parkways) of the urban development and not stand independently as people should use them both for recreational purposes as well as run-throughs from e.g. work and homes.

Olmsted's visions gave thus the foundation for many visions yet to come. They were astonishingly foresighted as Olmsted *"anticipated many of the principal concerns of urban planning, both infrastructural and social, down to the present day"* (Legates and Stout, 2007, p.307).

2.1.2 The Garden City movement of Ebenezer Howard

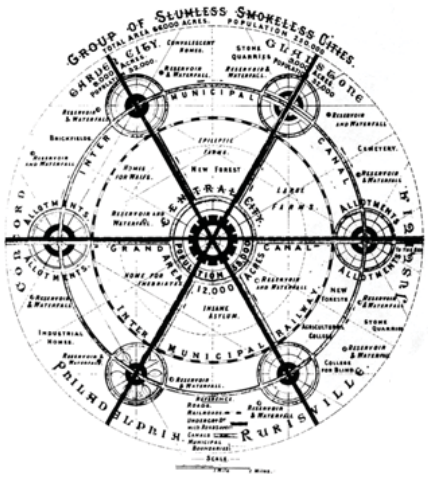


Figure 2-2: Ebenezer Howards diagram for a Garden City (LeGates and Stout, 2007)

Ebenezer Howard (1850-1928) was a stenographer that came up with the theories of The Garden City movement and wrote a book on that matter in 1898. This book that is now known as the Garden Cities of To-morrow is now considered to be one of the most revolutionary work of the urban development practice. Like Olmsted (see paragraph 2.1.1), Howard was one of the first pioneers to face the pollution problem of the industrial cities and protest against urban overcrowding but that he did on the other side of the Atlantic Ocean, in England. Howard was not professionally trained in the field of city planning, nor did he hold the title of a planner. He, like Jane Jacobs later (see Jane Jacobs visions paragraph 0) was thus a manifestation that one didn't have to be a planner to be able to plan inside the urban environment and that everyone can have a voice. (LeGates and Stout, 2007)

The Garden City movement is a theory that tackles the question, how to restore the people to the land? At that time there was a international consensus (at least in the Western World) that overcrowding were the cities main problem and that this problem would only get worse parallel to the rising pollution problem that would in the end lead to another migration, now out of the cities. The idea behind the theory was therefore not to initiate a sprawl of the cities but more as a way to tackle an imminent problem. At that time there were only to be found two ways of living i.e. town life or a country life. The idea was that there could exist a third way of living, it is what Howard (1898) called for Town-Country life.

> *"There are in reality not only, as is so constantly assumed, two alternatives - town life and country life – but a third alternative, in which all the advantages of the most energetic an active town life, with all the beauty and delight of the country, maybe secured in perfect combination"* (Howard, 1898, p.316)

These two main choices of living, Howard (1898) metaphors as magnets. The social life and high wages etc. of the Town Life was one as it drew many people to the towns. The beauty, cleanliness and freshness of the country life etc. were the other as also drew many. Both "magnets" had pros and cons that resulted in great conflicts but Howard (1898) wanted to make an alternative "magnet" that united the advantage of the existing two. Howard (1898, p.317) said that, the *"human society and the beauty of nature are meant to be enjoyed together"* and that he started to realize that through the making of the third "magnet", Town-Country. This was seen as a first step towards new hope, new life and a new civilization for the inhabitants of the existing cities. At first this new "magnet" would balance this conflict between the existing two but at the end it would alter the whole system so that town and country life could in the end be united as one. Howards (1898) objective was thus to develop municipalities, Garden Cities, (see Figure 2-2) in the outskirts of

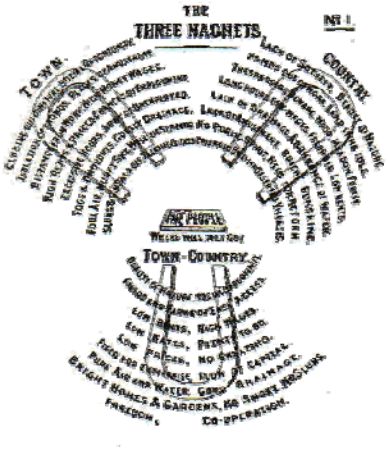


Figure 2-3: The three magnest of Ebenezer Howard (LeGates and Stout, 2007)

existing cities (though his ideal or original idea was to build a new city at an "unspoiled" place) where better:

> *"Opportunities of social intercourse may be enjoyed than are enjoyed in any crowded city, while yet the beauties of nature may encompass and enfold each dweller therein; how higher wages are compatible with reduced rents and rates; how abundant opportunities for employment and bright prospects of advancement may be secured for all; how capital may be attracted and wealth crated; how the most admirable sanitary conditions may be ensured; how beautiful homes and gardens may be seen on every hand; how the bounds of freedom may be widened, and yet all the best results of concert and co-operation gathered in by a happy people.* (Howard, 1898, p.316)

These municipalities should be about 6.000 acres (~2428 hectare) in size and should each contain (preferably) a circular city located in its center. These municipalities centers should have a size of approximate 1.000 acres (~405 hectare) leaving roughly 5.000 acres (~2023 hectare) for agricultural purposes. Each municipality should house about 32.000 inhabitants and the aim was to reduce the inhabitants need for travel and increase the quality of life by creating highly self sufficient and sustainable municipalities. (Howard, 1898)

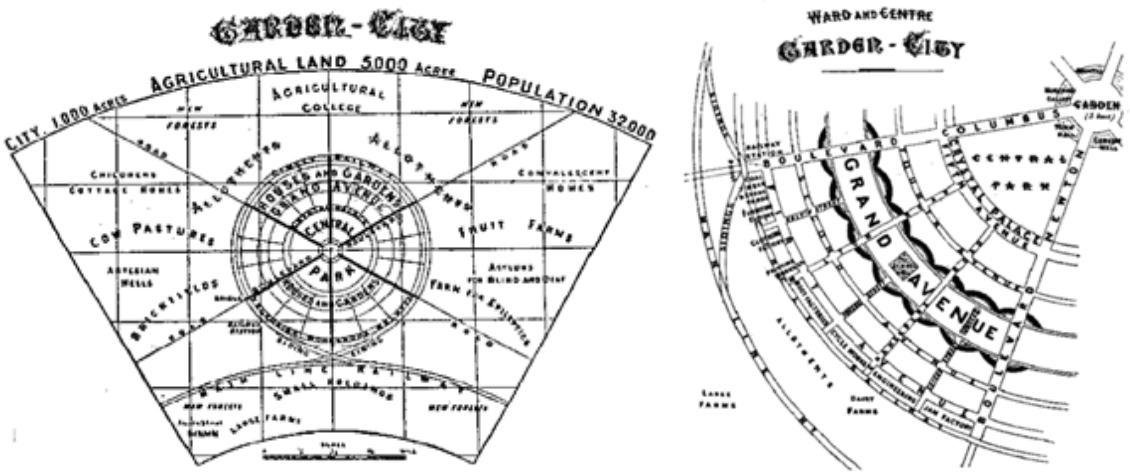


Figure 2-4: Ebenezer Howards Garden City municipality (T.L.) and ward (T.R.) (LeGates and Stout, 2007)

The whole municipality was very much "zoning" (see paragraph 2.2.1) orientated as each part had its purpose but Howard did not want to put restraint on anything. Each municipality, city or house should have freedom of choosing and developing their own architecture or style. The general structure was that the municipalities cities were divided into smaller wards by six wide boulevards (each housing one-sixth of the population and areal). (Fishman, 1982) In their centrums was a large garden surrounded by public buildings (town hall, hospital etc.) that then again were surrounded by bigger green park (Central Park). This Central Park should then be surrounded by a wide glass arcade called the "Crystal Palace". This arcade was to house retail shops and such and provide an alternative to the greenery of the center and a shelter from the elements of nature. Outside of the Crystal Palace lay a belt of different housing possibilities for the inhabitants, consisting of low rise houses, with different architecture. This belt was divided in two by a belt called "Grand Avenue", a green belt that was accommodated with public schools, playgrounds and religious buildings. The last remaining belt was then occupied by factories, warehouses, dairies, timber yards, etc. This belt was to be operated in close relationship with the railway that circled around the whole city giving

an alternative transportation mean for the inhabitants as well as serve the agricultural upland for supplies and needs. (Howard, 1898)

Howard's ideas though starting in England reached the continental Europe and then America and are now known to the rest of the world. Howard was one of the few, of that time "planners", able to see his planning ideas come into reality (e.g. Welwyn Garden City in England) though often in a little distorted version though. As said in the start, Howard's visions and ideas of the Garden Cities are highly respected inside the periphery of the urban development world. (Fishman, 1982) Theories like Traditional Neighborhood Development (TND), Transit Oriented Development (TOD) and New Urbanism (see paragraph 2.4.3) are highly inspired or influenced by Howards work and some might say that the Garden Cities make the foundation of modern urban development theories.

2.1.3 Le Corbusier Contemporary City (Radiant City)

Le Corbusier (1887-1965) (born as Charles-Édouard Jeanneret), like Ebenezer Howard, was self-educated as an urban planner. He was an educated architect that later became painter, city planner and philosopher that through his own studies and apprenticeships with men inside the field came up with a revolutionary plan for "A Contemporary City of Three Million People" in 1922. Le Corbusier in contrast to Ebenezer Howard never personally launched his idea, though he saw some of its principles carried out by others. Le Corbusier Contemporary City idea was not a futuristic vision, it was meant for the present time, but it can be reflected in many modern built-up projects. His idea caught the post World War I spirit of optimism and science and exemplified the energy and efficiency of the Machine Age. (LeGates and Stout, 2007) Le Corbusier was born in Switzerland, he travelled around Europe in his younger years but found his place in the end in France, Paris. There he tried to realize his ideas though mostly without success. Like his contemporary men, Olmsted and Ebenezer, Le Corbusier tried to resist what seemed to be the fate of the cities of the Industrial Revolution. His first version of the Contemporary City was highly class-based where economic positions played a role in housing opportunities. In his later version he expanded and reformulated his Contemporary City idea (now labeled as The Radiant City, as when it was published in 1935) were he abandons this early housing classification of economic status changing it instead to family size status. (Fishman, 1982)

Le Corbusier idea and theoretical background of the Contemporary City was not so far from Howards and Olmsted's ideas. His fundamental issue was to provide the polluted cities with lungs in form of open spaces, to increase density to diminish distances and to unite the advantages of town living and country living. His plan was to build Garden Cities in the suburbs but built in heights the central city, i.e. construct vertically, and by that save space needed for constructions. Le Corbusier was thus against low rise buildings that formed "corridor-streets". According to Le Corbusier streets should be built in multiple levels to satisfy the three types of traffic that were in his opinion suitable for modern cities, i.e. heavy goods traffic, lighter goods traffic and fast traffic. The traffic network should thus be a multiple leveled body, beneath-, at- and above the ground. This body would come together at the central station in the center of the city. This central station would thus combine all the transport opportunities of the city, i.e.: (Corbusier, 1929)

- At the roof, two storey's above ground there would be landing-platform for aero-taxis
- One storey above ground the raised tracks for fast motor traffic (from the suburbs etc.) would enter the station
- The ground floor would be a "normal" entrance with booking offices and ticket sales for public transport.

- One level beneath the ground would be tubes (traffic on skins) which serve the city and the main arteries
- Two levels beneath the ground would be suburban lines
- Three levels beneath the ground would be main lines for long distance transport

Le Corbusier plan was thus a holistic plan for a city built up of concrete and steel with three million inhabitants. In the central city (see Figure 2-5) the density should be high to obtain a shortening of distances. This central city should have twenty-four sky-scrapers designed purely for business and hotel purposes, housing 10.000 – 50.000 employees and 400.000 – 600.000 inhabitants. Around these sky-scrapers should be a great open space descending by stages. These descending spaces should be occupied by restaurants, cafes and luxury shops etc. Le Corbusier, like Ebenezer Howard before, apparently practiced the principle of "zoning" (see paragraph 2.2.1) for his Contemporary City. In the center the sky-scrapers were the main theme, then came a zone occupied by public buildings like museums, theaters and municipality and administrative offices along with set-back luxury residential dwellings. The "cellular" residential blocks embraced the whole city and a large park put a distinctive feature on the whole. A large percent of the city was to be reserved for green areas and parks and moreover a belt of greenery should separate the Garden Cities in the distance. The Garden Cities embracing the city should house 2.000.000 inhabitants and the residential houses of the central city should house additional 600.000 inhabitants making the city into a contemporary city of three million inhabitants. (Corbusier, 1929)

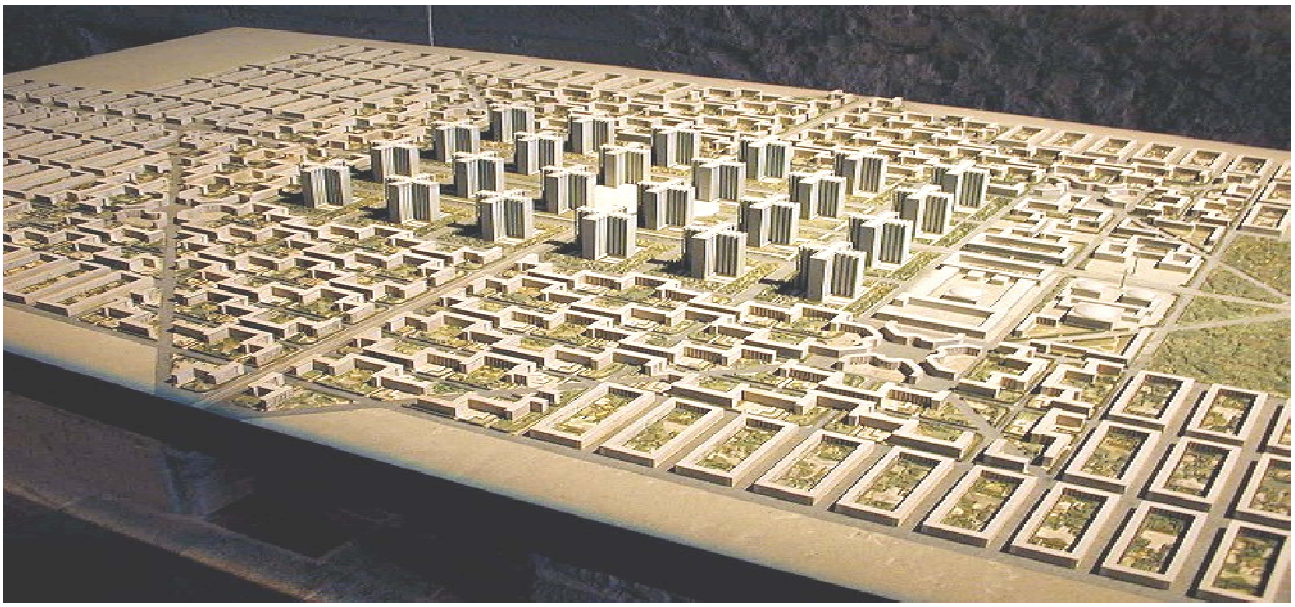


Figure 2-5: Le Corbusier Contemporary City of Three Million Peoples, the Central City model (Munteanu, 2012)

Le Corbusier vision of a pre-fabricated, zoned city with a rigid geometric pattern associated with advanced transportation network was maybe an unrealistic project to obtain. His way of using the concept of bringing nature into the city was also maybe a more philosophical idea than a practical one. As a philosopher, thinker, dreamer or theorist, Le Corbusier as many before him and many yet to come had to be provocative in his approach of the subject i.e. to get his ideas heard. His Contemporary City proposal caught great attention, publicism, outrage and debate, debate that is still going on today. Le Corbusier Contemporary City ideas have never been used as he proposed back in the early days but governments around the world have adopted many of the principles of his findings with controversial results (LeGates and Stout, 2000). According to LeGates and Stout

(2000 p.309), Le Corbusier will be remembered as a true prophet of modern urbanism and his style even said to have *"become the International Style of our time"*.

2.1.4 Frank Lloyd Wright Broadacre City

Frank Lloyd Wright (1867-1959) (born as Frank Lincoln Wright) was an American architect, interior designer, writer and educator that in 1935 introduced his model and ideas of a "Broadacre City". According to LeGates and Stout (2007, p.331) Wright was known for and a great spokesman for *"organic architecture" and a style of building that expressed "the nature of the materials"*. Wright was one of America's greatest architects and an artistic genius that tried to put the individual in the center by following the "American spirit" and democracy. He opposed the behavior or desire of so many for wealth and material possessions that had little interest in ethical behavior. He thus despised political systems where the people were the source of control, where corrupted people of the society could freely play or mold the urban development to their own advantage. Wright wanted thus to restore earlier Emersonian and Jeffersonian virtues of small units and faith in the general public. He believed that if the "common man" were given education and private space he would be able to elect wise and choose virtuous leaders that in the end would serve the general public and make a functioning whole for the urban development.

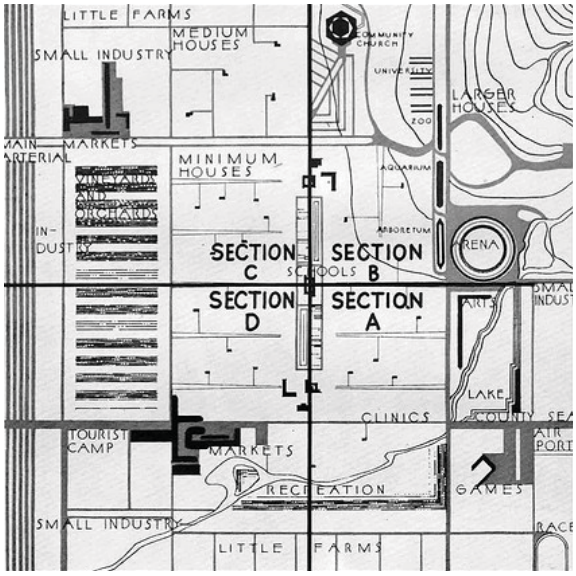


Figure 2-6: Frank Lloyd Wrights four square miles plan for Broadacre City, 1935 (LeGates and Stout, 2007, p.334)

This, Wright tried to realize in his vision of "Broadacre City". Wright believed that the existence and development of the automobile and telecommunication would mark the end of overcrowded, high density and polluted cities that he, like so many, hated. He meant that in the light of these "new" inventions large cities would wither and decay or as LeGates and Stout (2007) put it:

> *"Wright believed that two inventions – telephone and the automobile – made the old cities "no longer modern," and he fervently looked forward to the day when dense, crowded conglomerations like New York and Chicago would wither and decay. In their place, Americans would reinhabit the rural landscape (and re-acquire the rural virtues of individual freedom and self-reliance) with a " city" of independent homesteads in which people would be isolated enough from one another to ensure family stability but connected enough, through modern telecommunications and transportation, to achieve a real sense of community"* (LeGates and Stout, 2007, p.331)

Wright saw his idea of the Broadacre City as a new freedom for living in America, liberation from the burden of the industrial age. He wanted (when the modern cities were gone) to minimize the administrative system of each county down to only one minor government. He wanted to make all pathways and decision making easier by eliminating many of the intermediary persons, institutions and distributers. This he wanted to do by e.g. having raw material and such directly delivered to the consumer from the maker, burning coal at the mine and transport the energy instead the coal itself and have all public utilities, like administration, patrol, banking, fire and post, in the hands of the

state and county government. With this he wanted the general public to see the vitality of politics and how important it is to participate in political matters. (Wright, 1935)

Wright (1935, p.333) said that in the Broadacre city is *"nothing poor or mean"* and that there exists no distinction *"between much and little, more and less"*. By this he meant that his design could eliminate all class struggle and lead the society into ways of more self-sufficiency. He designed the city so that childless families were given a one acre lot and larger families got larger lots decided by the state. Minimalism could describe Wrights vision as everything was meant to be small and compact with organic architecture. By this Wright wanted to eliminate jealousy and conflicts. His idea was not to eliminate individual character though as each individual was allowed to design their own ground (in harmony with the whole as observed by the county architect) and each county would thus also get its own distinctive feature. As is the nature of organic architecture each county or ground was to be designed after the existing shapes, *"architecture is landscape and landscape takes on the character of architecture"* (Wright, 1935, p.333). Facilities like roads thus becomes a great architecture where trees are not planted in straight rows alongside the streets but more in clusters or parks were their usage as source of fruit, shade or rest is highlighted. (Wright, 1935)

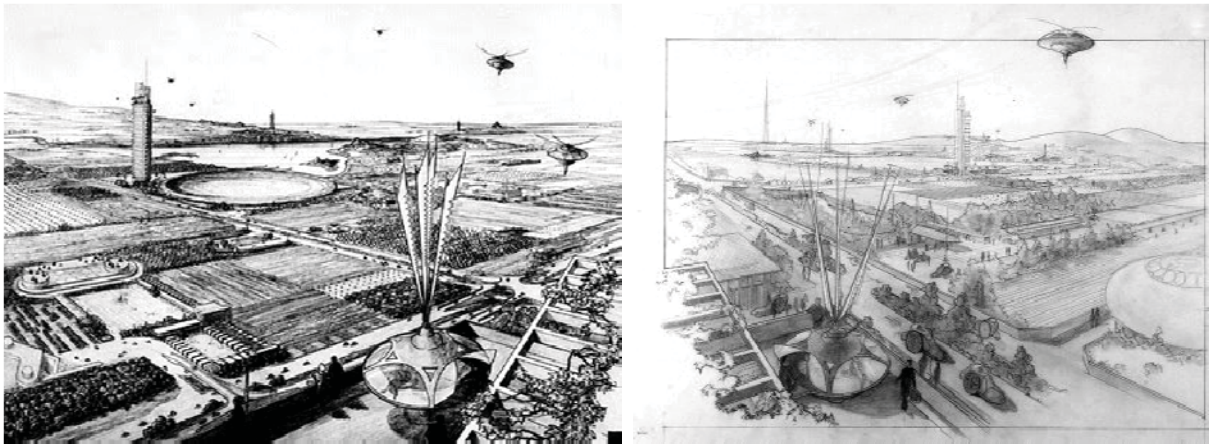


Figure 2-7: Captures of the atmosphere of Frank Lloyd Wright Broadacre City [T.L. (Should We Live in Broadacre City, 2010), T.R. (Wissahickon Walk, n.d.)]

Wrights vision was also that every citizen should have his own car to enjoy the altered and simplified road network that would be designed in the Broadacre City. For long distance travelling cars could be put on trains or Broadacre citizen could use their self-contained mechanical flying unit (see Figure 2-7). Wright rejected the air transport as a mass transport, on fixed routes, as the future would behold aerator owned by individuals. This improved and upcoming transportation means would give additional freedom for the citizens to travel and become more independent. (Wright, 1935)

Frank Lloyd Wright´s idea was highly utopist and as such they give the reader a freedom to wonder for himself what the future would behold if his visions had become a reality. It is no doubt that his visions for the development of the automobile would have created more traffic nightmares than it would have solved. His idea, founding a society of individually owned small houses, car ownership and telecommunication has sadly become a standard form for many nations and lead to a huge problem in what is now known as suburban sprawl.

2.2 Derived planning concepts

These four mentioned utopian visionaries were dreamers that planned at their own initiative what they believed were an example of a better world. If these were practical or plausible goals is yet unproven but what is sure is that these early ideas have left the world with urban planning concepts that have followed the urban planning practice ever since. In the following chapters four planning concepts will be analyzed. Three of them, Zoning, Satellite planning and Suburban pattern are the ones that the past urban planning practice of Reykjavik had a huge focus on and these became thus in forefront for past urban development practice that resulted in Reykjavik's appearance today. The last concept analyzed, Participatory planning is what the present planning practice is starting to recognize and focuses on as it invariably will be in the forefront for the future urban development of Reykjavik. All four planning concepts make thus a frame around the main past and future tools and concepts of the urban planning practice and thus are directly linked to the holistic understanding of Reykjavik's urban development.

2.2.1 Zoning

Zoning in urban development practice is a potent instrument to control urban development that links back to the planning practice of the post Industrial Revolution. At first it was used to reduce air pollution and improve the health and living conditions in the industrial cities and has now developed to a powerful tool to the urban planning environment (Elle, 2012)

Zoning in its most fundamental form is to divide a certain area of land into smaller units where only certain land uses and types of buildings can be constructed. The idea is to separate certain activities and building types that don't mix well, like industrial areas from homes or recreational areas. Zoning is thus not only based on organizing land usage and its activities but also on managing ground rules i.e. allowable building heights, building material, buildings coverage of the ground floor, allowance of parking etc. Zoning can thus facilitate the planning practice as it can eliminate conflicts due to illogical land usage and types of activities and thus lead to an overall approval of plans. (Ellis, History Of Cities And City Planning, 2007)

Zoning can have darker sides though as it can have great influence on economic and other social activities. If not treated right under the guidance of skilled persons it can affect the quality of the environment, the provision of public service, the distribution of income and wealth, racial segregation, the pattern of commuting, development of natural resources, and the growth of the national economy etc. (Fischel, 1987) Zoning is thus not only a matter of local concern but rather a harmonious play of all the actors of the urban environment. Zoning can thus been seen as an instrument or a tool made by theorists for governments, politicians, planners and the general public to use and by that make a united functional whole in urban development of regions, cities or neighborhoods. (Fischel, 1987)

2.2.2 Satellite planning

In 1920 a derivation of Ebenezer Howards Garden City concept, Satellite Planning, emerged in London, Britain. This concept became used over, that time, expansion of London as the planners were planning to expand the city beyond London's "urban fringes" (see paragraph 3.2.4.4.5 Fringe belts). As a part of London's housing schemes (to facilitate the pollution problem) the plan was to expand or disperse the city by building additional towns (satellite towns) in the vicinity of London. The plan was to build these towns in the spirit of the Garden Cities although that was never accomplished. These towns developed into lacking density and all economy and social self sufficiency that was the backbone of the concepts of the Garden Cities. According to Ward (1992) these new satellite towns even developed into lacking physical separation from London as the green

belt in between was *"submerged in a sea of private suburbia"*. The concept of satellite planning transformed then over time into the concept "New Town" but it didn´t change much. According to Ward (1992, p.17), the New Town concept spread across Europe and Scandinavia and only developed into *"semi-independent satellite model, usually focused around transport links with the metropolitan core"*.

The re-usage of Howard's idea, and sometimes almost exploitation, was not only bound to Britain but happened all over the world. Different hybrids of the theory emerged in Britain under the names of "garden village" and "garden suburb" and in Australia it emerged under the name "new country town". (Ward, 1992)These hybrids, whether they were called Satellite Planning, New Town or something else became international concepts that have, in more modern times, been given the name leapfrogging development. Leapfrogging development is when urban areas start to grow out of the urban fringe belt with construction of new low density towns that afterward lead to the green belt separating the two is filled with new development. (Angel, Sheppard, & Civco, 2005)

In light of these evident, Satellite Planning and the urban development that followed can thus been seen as the first evidence of suburban pattern and urban sprawl of the modern cities.

2.2.3 Suburban pattern

Suburban pattern refers in most cases to a residential area in close connection to a city or as a separate community within commuting distance of a city. Suburban pattern is a complex relationship between urban development matters, economics and the will of the general public. It emerged in the late eighteenth-century and seems (hopefully) to have peaked in more modern times. The concept did not only emerge by the making of theories or the will of urban planners but also increasingly by pressure from middle- and upper class and families and developers. (Fishman, 1987) Suburban pattern evolved gradually and anonymously by trial-and-error methods or as Fishman (1987, p.25) puts it, *"suburbia was improvised, not designed"*.

The main features of a suburban area is *"its coarse grain of use and of social class, its heavy cost of construction and maintenance, and its reliance on the private car, which leaves it vulnerable to fuel shortages and makes access difficult for outsiders or the young and the aged among its own people"*. (Lynch, 1984, p.274) The suburban pattern has though also an attractive side linked to it. According to Lynch (1984, p.363) *"most North Americans look with affection on the leafy, affluent suburb, with its perceived attributes of comfort, ease of movement, apparent lack of social conflict, prestige, security of tenure, responsive government, safety for children, good service, ample space, and pleasant planting"*. This attractive and emotional side of the concept challenge modern urban development and makes changes more difficult or as Lynch (1984, p.1) puts it *"If we could be articulate about why we feel that way, we might be prepared to make effective changes"*.

When looked into in more detail there will not be many urban theorists and planners in the 21st century that will recommend the suburban pattern. Many will agree with Langdon's (1994, p.2) opinion that the ways of living associated with the suburbs *"has been bad for us as individuals and as a society"*. The suburban pattern will thus not be dealt with in a good manner without contribution of all participants of the society, something called for participatory planning.

2.2.4 Participatory planning

Participatory planning is a method which means the public is given a part in the decision making process of regions, communities or neighborhoods to improve their urban or rural environment.

> *"The idea of citizen participation is a little like eating spinach: no one is against it in principle because it is good for you"* (Arnstein, 1969, p.234)

Though this statement is rather straight forward does not give enough explanation for why participatory planning is so vital. It is not every one that "eats spinach though they know it is good for them" but it is though in modern urban planning practice a wide consensus on how good influence public participation has on the planning practice. There are a few main reasons for public participation: (Velfærdsministeriet, 2008)

- It is a democratic way to allow everybody to have a voice and be heard
- Through added knowledge participation adds resources and qualification to the planning practice
- The general public have eyes for where additional planning is needed, thus giving a more focused planning practice
- By participation a connection or a relationship is set that lasts through the whole project and its lifetime
- Public participation strengthens the legality of a project and decreases conflicts
- Public participation creates a shared learning between the general public and the administration
- Public participation through participatory planning helps to develop the democracy

The word "public" is a wide word and a complex one when one starts to talk about participatory planning. Public participation is about giving the freedom to participate in projects of public matter, but it is often hard to get the opinion of the masses right at all time. This is because the "public" does not always consist of the vide variety of the mass. It is thus a huge challenge to get the "public" to participate so that it represents the "cross-section" of the society. It is apparent that if only e.g. expert activists participate then the idea of the local organizations, nonprofit organization or general citizens is not heard. (Velfærdsministeriet, 2008)

An additional factor in all this is then when to participate, i.e. when should government involve these greatly different actors of the urban environment and their greatly different cause and motivation for participation (see e.g. paragraph 2.4.2.5.4 Inhabitants influence (NIMBY))

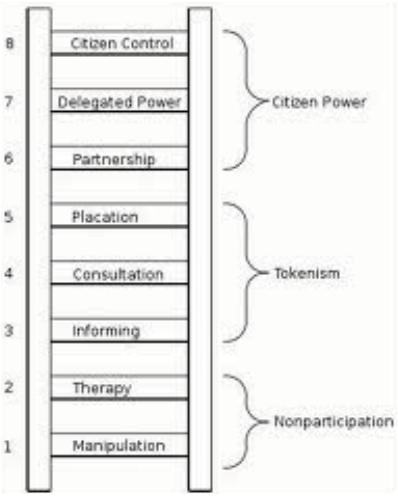


Figure 2-8: Arnstein eight rungs on the ladder of citizen participation (Arnstein, 1969)

This complex relationship between governmental and public participation processes has challenged many. Arnstein (1969) tried to tackle this and explain through a metaphor of a ladder, i.e. the steps of participation (see figure 2-8). On the lower steps citizens are engaged in extensive activities with the aim of "educating" them and gaining their support. These steps have nothing to do with participation. The third and fourth steps present the first steps towards legitimate citizen participation though they represent a one-way flow of information and therefore do not assure that citizen's words are heard. It is only in the fifth step, placation that citizens begin to have some degree of influence by involving ordinary citizens on boards and committees without e.g. them having the final say in the board's matters. This step can create false appearance of public participation though it is not always the intention as it is the foundation of tokenism. The two highest steps of the ladder of citizen participation are rare to see in practice

today as they represent actions where citizen groups are given partial or full control over programs. The one that is most used in Western societies and considered most influential in modern times is a partnership between public, private, and nonprofit organizations. LeGates and Stout (2007, p.234) describe this step as follows; *"Partnerships represent a redistribution of power arrived at through negotiation. Where the odd bedfellows of local government, private corporations, and neighborhood nonprofit community-based organizations form joint planning and decision-making structures, citizen views can have real weight"*.

2.3 Post war planning

"it is a common characteristic of planning in most areas in the world that post-war city planning was in general very bad" (Valsson ,2003, p.384)

What has been described early in this section, are four of the cannons of early urban planning practice and few of the resulting concepts. To pick these out is not to say that there haven't existed any other planners, movements or concepts of specific relevance, but only to capture the atmosphere and derivation of the planning practice of that time and pinpoint the ones that have had the most relevance to Reykjavik's urban development. In the following, though no names are mentioned, the planning era of the post World War II and the transition leading up to that era will be analyzed as it shaped and had profound influence on the planning practice of Reykjavik as well at the rest of the Western World.

2.3.1 The transition era

The previously mentioned post industrial visions and planners were highly utopist and they belonged to or became the ancestors of what later became known as "physical planning". (LeGates and Stout, 2007) Physical planning prevailed until the mid 20th century and has sometimes been called the "golden age" of planning. The golden age of planning was when planning was mainly related to land use, transportation, capital improvements and infrastructure. (LeGates and Stout, 2007) Planning was then mainly practiced by a few men, viewed as privileged elite that based its work on architecture and unrealistic plans. Planners of that time were not expected to interact with the people they planned for and their work in most cases ended with holistic plans for an area and detailed architectural drawings of its neighborhoods i.e. a functional plan that should be used as a construction drawing for specific sites. (LeGates and Stout, 2007) As no afterwards learning processes were attached to any of these plans, planners were actually expected to do their job right the first time, all the time, and thus their profession was considered a profession of expertise. The planner could therefore stretch out his job and in the atmosphere of that time there was nothing to hurry him up. The world moved in a slow manner with slow changes, stagnant population and depressed economy. (Hall, 2001) This was the transition era were the age of utopist planning and physical planning were reaching an end and the rise of "system planning" were imminent.

2.3.2 System planning (top-down planning)

Suddenly at the end of World War II everything changed and that almost overnight. According to Hall (2001, p. 357) this past time and transit era of planning was a *"happy, almost dream-like, world. But increasingly, during the 1950s, it did not correspond to reality. Everything began to get out of hand"*. The planning practice of the Western World had to adapt to changed circumstances and fast as the post war years brought huge population, economic, technologic, information, intellectual and computerized boom to it. The planning practice therefore changed drastically, i.e. *"from a kind of craft, based on personal knowledge of a rudimentary collection of concepts about the city, into an apparently scientific activity in which vast amount of precise information were garnered and processed in such a way that the planner could devise very sensitive systems of*

guidance and control". (Hall, 2001, p.358) The complex resurrection of the car and associated transportation means caused transportation planning to split from the traditional city planning. In addition traditional city planning became a "system planning", i.e. a computer based, top-down planning where examination and evaluation of a project in order to go ahead identify and implement more efficient methods to be used in a given project. This era of top-down planning showed some resilience but in the end had to give in for the demand for "bottom-up planning".

2.3.3 The demand for "bottom-up planning"

According to Hall (2001, p.360) the change of the planning profession was peaking in the late 1960s. Then new studies showed that *"crucial urban decisions were made within a pluralist political structure in which no one individual or group had total knowledge or power [off]"*. The power structures in cities were resulting in empty words and broken promises that only served the few, often local politicians, but not the general public. This, through civil-rights movement and protest against the Vietnam War etc. became a nail in the coffin of top-down system planning and now the demand for bottom-up planning, where public participation was the main key, rose. At the end, around 1980, the city planning practice changed and was divided into two "branches" i.e. theoretical- and empirical planning. Though not purely black and white the theoretical planning took up the task of the academic debate and supervision of the corruption forces in the society through academic literature and theory making. The empirical part of the planning practice took up the real-world problems and real-life planning in cooperation with the general public and politicians. Some say that the trend has been that empirical planners have taken over many of the functions that the locally elected official had previously exercised (and failed). (Hall, 2001)

The planning practice that the late 20th century was facing differed greatly from the one that the post war period had to tackle and was many "light-years" away from the utopist vision of the post industrial era. Now planners, citizens, interest groups, local elected officials, developers and other actors in the urban environment had to cooperate to reach a good end-result. A good end-result by using this democratic method is though never accomplished without conflicts. Conflicts became a daily bread for urban planners as different actors have different views on what makes a region, city or neighborhood a good place to live, work and play in. These conflicts and how to best tackle the urban planning practice brought about huge challenges to the planning practice. Drastic rise in the world population, oil crises and pollution effects while countries were facing more urban than rural living pattern only brought about more pressure and thus it is stated that the planning practice in the late 20th century were at a "boiling point".

At the "boiling point", the planning practice in the late 20th century sought inspiration from the early planning principles and theories in order to tackle imminent urban development problems. This is said as the emerging social and environmental agendas of the late 20th century had strikingly many resemblances to the ones in the "golden age". Ward (1992, p.1) lists this up as resemblances like *"the progressive rejection of the big city; the desire for small town living and working; the search for real involvement in common affairs; and, not least, the adherence to a new 'green' lifestyle"*. Because of this, the post war planning is often said to have been a maturity period for the urban planning practice of the world meanwhile the late 20th century to be a return to the principles of the planning practice "golden age".

2.4 Planning theories in late 20th century and early 21st

In 2010 over half of the world's population or about 3,5 billion were living in cities. The global population has in the 21st century become more urban and less rural and thus a high density living is becoming the global condition. (Revision of World Urbanization Prospects, 2009) The population

of the world has grown enormously in the 20th century, almost exploded as the population increased from 1,65 billion to 6 billion (it was first in 1804 that the world population reached 1 billion).(The World at Six Billion, n.d.) In 2010 the world's population was reaching the staggering 7 billion number and it is estimated that by 2050 this number will reach 10 billion. (United Nations Press Release, 2011)

Many speculations hover around about the population increase of the globe, to some those prognoses are overestimated and to some those are underestimated. To some the earth cannot tolerate increased population and to others this increased population will save the planet from its miseries as from the mass technological improvements and innovations will rise. The debate over the last 30 years or so has resulted in a widespread consensus on the poor state of the planet though. The 20th century has left the 21st century with many environmental problems that impact across national boundaries. These are e.g. deforesting, depletion of fish stocks and pollution of air, groundwater and soils. These different environmental problems the humans have cast over themselves and the planet with their consumption behaviors and lack of regard over the earth's resources have resulted in e.g. that the world is facing "climate change".

It is stated that this climate change i.e. the global warming is caused by the emission of greenhouse gases. The world's emission of greenhouse gases is out of balance. The developed countries that host about 20% of the world's population produce almost half (46,4%) of the greenhouse gases emission and the 80% of the population that lives in the developing countries supplies the other half (53,6%). Greenhouse gases are a combination of varied gases but the one that contribute the most is the emission of carbon dioxide that has its origin in burning of fossil fuels. (Dodman, 2009) Most motor driven transport has combustion engines and burn petroleum or oil (fossil fuels). The transportation sector of the world produces alone for about 14% of the whole emission of carbon dioxide and is the second fastest growing source of such emission. Because of the vast growth of the car industry this figure is expected to double by 2050 making the transport sector an even larger sinner in the fight against climate change. (Kingsley and Urry, 2009)

The earth and the humankind are in an environmental crisis that stem from human activities and one of our salvations could be in "sustainability". The concept of sustainability has its origin in the late 20th century and by many is said to be the most efficient tool to remedy the mistakes of past generations. As transportation, density and mobility are also central to this study, the planning theories of Compact City (Smart Growth) and New Urbanism will be analyzed. These urban planning theories have incorporated the concept of sustainability and describe well the writer´s imaginings in which direction t Reykjavik's planning practices are heading in the 21st century. (Arbury, 2005)

As the car usage and ownership of the municipality has been the ruling force in its 20th century urban planning, some learning will be found from the two books After the Car and Sustainability and Cities: Overcoming Automobile Dependence. A review of the key findings of which will follow as well, as an idea of where Reykjavik municipality is heading.

2.4.1 Sustainability

Figure 2-9: It's a huge responsibility to pass on the global sustainability (Care about the planet, n.d.)

As the world found itself in an environmental crisis that could have catastrophic consequences for the whole globe and its civilizations, the theories of sustainability came as a fresh breeze for some nations. Sustainability as an expression that first emerged in 1972 at the UN Conference on the Human Environment in the capital of Sweden, Stockholm. The Stockholm Conference was the UN's first major conference on international environmental issues on a global scale. 113 nations participated and gave their word to begin cleaning up the environment and, most importantly, to begin the process of tackling environmental issues on a global scale. For some nations this sense of limits was new and the Third World nations saw the agenda as just another way to prevent them from attaining their developmental goals. To try to solve those kinds of conflicts the UN established the World Commission on Environment and development in 1983 followed by, in 1987, publishing of a report called Our Common Future. In this report that is sometimes named the Brundtland Report the UN was trying to recapture the spirit that emerged at the Stockholm Conference. The report introduced for first time the phrase "sustainable development" and its subject matters laid the groundwork for the 1992 Earth Summit in Rio de Janeiro. 179 nations, representing 98% of the world, participated in the Rio Conference that resulted in the making and signing of a statement for future sustainable development called the Rio Declaration, an action plan called Agenda 21, a Convention on Climate Change, a Convention on Biological Diversity, and a Statement on Forests. (Newman and Kenworthy, 1999)

2.4.1.1 Sustainable development

The most famous definition of sustainable development is according to the Brundtland Report a:

> *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs."(Our Common Future, 1987)*

This definition means that any economic or social development should improve, not harm the environment. Meanwhile this definition indicates that sustainability is a vision and a process, not an end product.

Sustainability at a global scale is best gained through equality of its three development pillars, i.e. Economic, ecologic and community (equity). In these foundation pillars (see Figure 2-10) the most powerful needs of our time is said to exist. Firstly there is this need for economic development to overcome poverty, second, the need for environmental protection of air, water, soil, and biodiversity, upon which we all ultimately depend, and thirdly the need for social justice and cultural diversity to enable local communities to express their values in solving these issues. (Newman and Kenworthy, 1999)

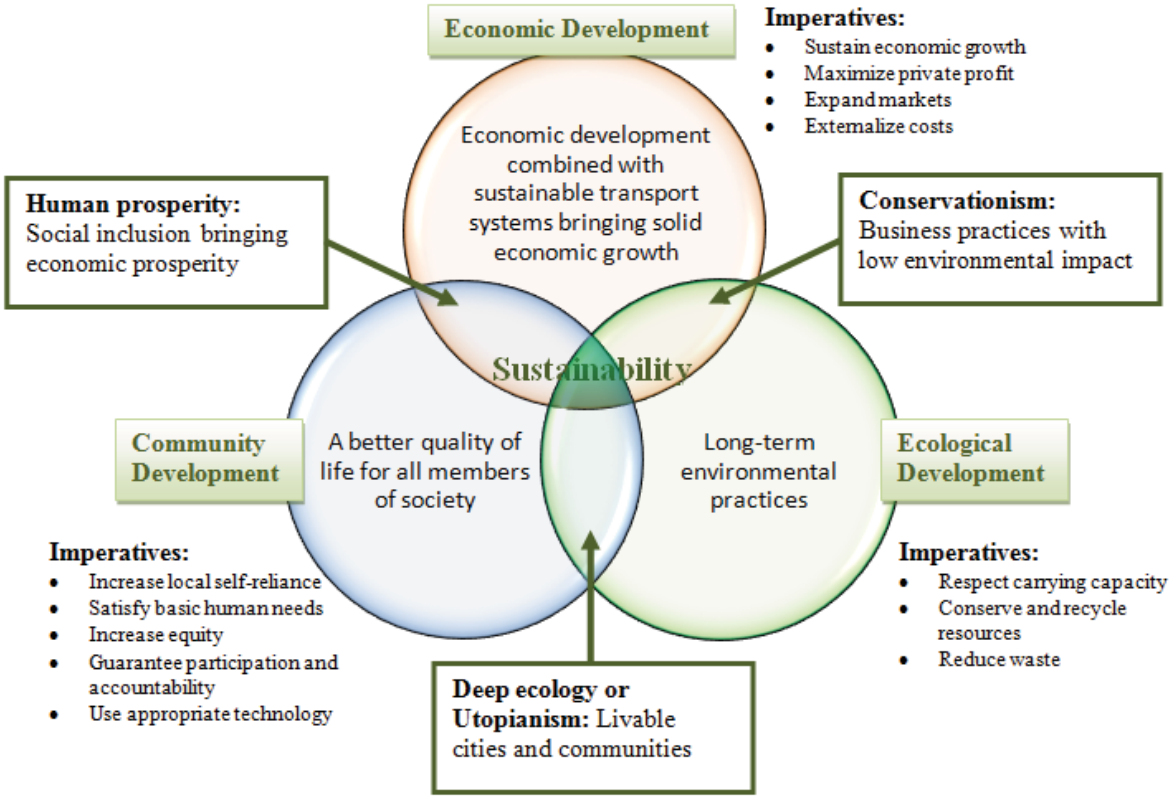


Figure 2-10: The three foundation pillars of Sustainable development [(Newman and Kenworthy, 1999) and (Sustainable Development, n.d.)]

Sustainability is thus a continual improvement of our existence and shows us the vitality of looking to the future when planning. This concept has emerged from a global political process that has resulted in few fundamental principles, i.e. to eliminate poverty (especially in the Third World), to reduce consumption of resources and production of waste (especially in the First World), to tackle intensive environmental issues through global cooperation and to use community-based approaches that take local cultures seriously to move towards sustainability. (Newman and Kenworthy, 1999)

> *"Sustainability is a concept developed in the global political arena that attempts to achieve, simultaneously, the goals of an improved environment, a better economy, and a more just and participative society, rather than trading off any one of these against the others. While its primary context is global, sustainability is seen to be meaningful and achievable only when it is practiced through local initiatives with global significance."* (Newman and Kenworthy,1999, p.333)

2.4.1.2 Urban sustainability - Issues central to sustainable planning in cities

In the past, major environmental battles were fought outside cities. Now as the world population has "gone urban" with its extreme consumption behavior, it is universally recognized that there is a need to take these battles to the cities. The growing communities of modern cities provide thus both challenges and opportunities for sustainability. In cities, people and resources are located close to one another so it gives opportunity to save energy, nurture the city economy, generate ideas and provide an outlet for social interaction. If fostered and taken care of, cities can be highly sustainable and provide an outlet for social interaction and thus providing the humans for their basic needs of livability.

2.4.1.2.1 Cities as system

It is now recognized that a city shall be viewed as a type of system. As an ecosystem, cities have inputs, throughputs and outputs. Inputs are e.g. people in form of newcomers, land, water, food, energy and building material. Throughputs are the digestion of the inputs in form of e.g. transportation-, economic- and cultural priorities as well as sensible land usage. Outputs could be divided in two parts, it is waste outputs and livability. Waste outputs are e.g. waste water and export of solid waste without recycling, air pollution, emission of greenhouse gases and toxics. Livability could by e.g. health of inhabitants, degree of employment, value of income, level of education and quality of urban areas, community and activities inside the city boundaries. A balance between inputs, throughputs and outputs is said to be critical for city to become more sustainable (Newman and Kenworthy, 1999)

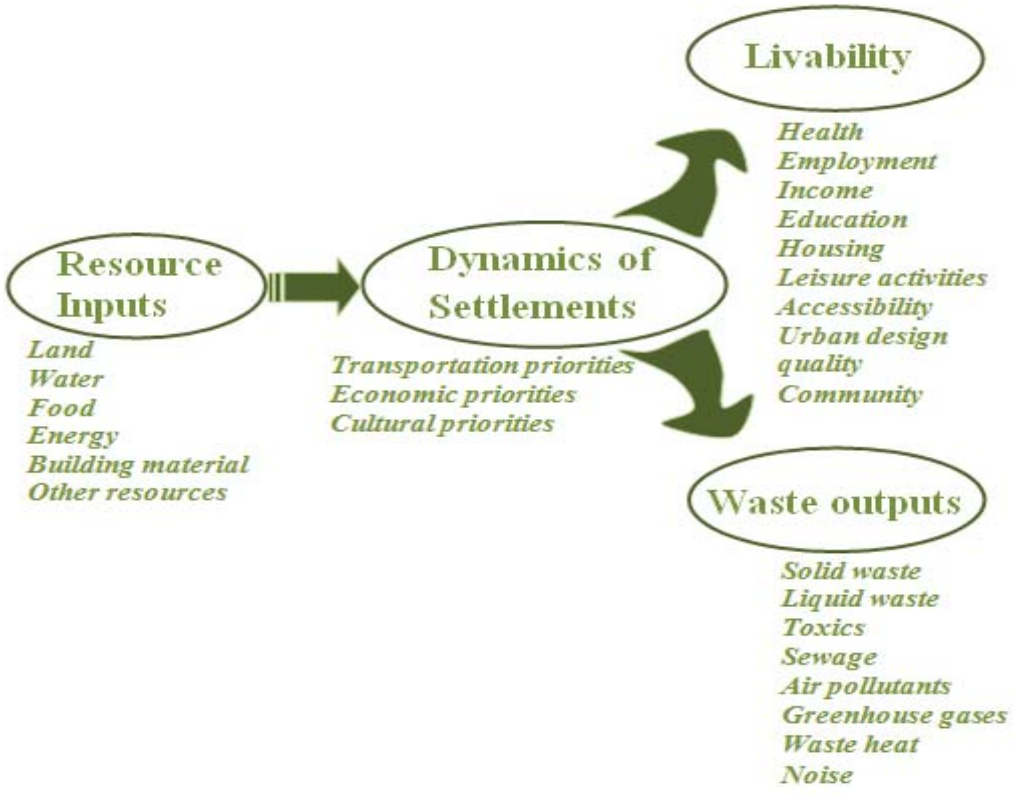


Figure 2-11: Extended Metabolism Model of Human Settlements (Newman and Kenworthy, 1999)

2.4.1.2.2 Measuring sustainability in cities

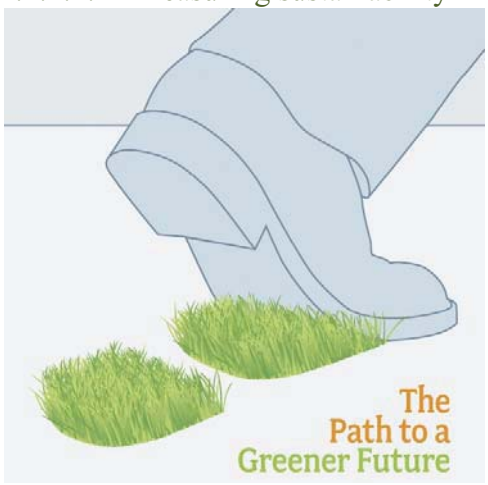


Figure 2-12: sustainability of a city can be measured from its ecological footprint (The path to a greener future, n.d.)

By looking at Figure 2-10 it can be seen that by setting practical goals or indicators cities sustainability could be measured. With the help of indicators, complicated processes, or course of events can be made more comprehensible and visible. Indicators do not have to be the same for each city (region or country) but by having them the same, a global comparison could be made. The most recognized way of getting global comparison of sustainability is by measuring cities (regions or countries) "ecological footprint". Ecological footprints are measured by the way we, the humans, manage our land- and energy use, our consumption, travel patterns, production and exports and the demand these have on our ecological environment. Meaning that the ecological footprints measures how fast we consume resources and generate waste and compare it to how fast nature can absorb our waste and generate new resources. Ecological footprints can thus help governments, in their quest for more sustainability as well as being a tool to inform the public and the global environment of the city (region or country) sustainability level. According to the Global Footprint Network, humanity as a whole demanded the resources and services of about 1.5 planets in 2007, meaning that it now takes the Earth one year and six months to regenerate what we use in a year. This overshot indicates that today the stocks of ecological capital may be depleting and/or that waste is accumulating. The humanity has actually, since the 1970s, been in ecological overshoot with this annual demand on resources exceeding what the Earth can regenerate each year. If the "business continues as usual" this number is only going to get higher. (World footprint, 2011)

Ecological footprints are not everywhere the same though the richer countries consumption behavior is more pervasive than the one in the developing countries. According to the Global Footprint Network (World footprint, 2011) the current population and available land area of the globe only "allow" 1.8 global hectares per person so that a country's resource demands will be globally replicable. Global hectares per person refer then to the amount of biologically productive land and water available per person on the planet. According to that, over 5 planets would be needed to support mankind if everybody lived the lifestyle of an average person in United States and over 3 planets if everyone would live the lifestyle of an average person in United Kingdom. (World footprint, 2011)

2.4.1.2.3 Local Agenda 21

From the above can be read that unsustainable cities (regions or countries) would be e.g. the ones where great amounts of products are exported without much recycling, where land use and urban design would not lead to more livability or infrastructure and culture would lead to more emission of toxics and accumulation of waste. Those examples would create a widening ecological footprint and by that it can be seen that sustainability does not only cover environmental issues but also physical and economical issues as was seen in Figure 2-10.

> *"Humanity stands at a defining moment in history. We are confronted with a perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill health and illiteracy, and the continuing deterioration of the ecosystems on which we depend for our well-being. However, integration of environment and development*

> *concerns and greater attention to them will lead to the fulfillment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future. No nation can achieve this on its own; but together we can - in a global partnership for sustainable development."* (Agenda 21, n.d.)

The root of the sustainability concept lies thus very locally although the concept enhances global cooperation. So to implement sustainability to cities the need for changes at the community based level is vital. Chapter 28.2 in the Agenda 21 action plan (derived from the Earth Summit in Rio de Janeiro) implies that all nations shall implement Local Agenda 21 as an addition to their battle for sustainability.

> *"Each local authority should enter into a dialogue with its citizens, local organizations and private enterprises and adopt "a local Agenda 21". Through consultation and consensus-building, local authorities would learn from citizens and from local, civic, community, business and industrial organizations and acquire the information needed for formulating the best strategies."* (Agenda 21, n.d.)

Local Agenda 21 is a welfare plan, i.e. a plan to identify local sustainability priorities and implement long-term action plans for each community. This plan is to divide up the global problem so it can better be tackled at a local level: "act local and think global". This welfare plan is therefore a holistic plan for the sustainable development of each community in the 21st century and it is to urge citizens to help and to participate and take responsibility for its own and its community urban development so it may become more sustainable. It is only by acting locally, i.e. to have every single citizen understand the vitality of his participation that a real global sustainability is reached. (Reykjavíkurborg-Umhverfissvið, n.d.)

2.4.2 Compact City (Smart Growth)

Figure 2-13: city center of Reykjavik (Reykjavik: The ground heats the city, n.d.)

In the following a study of the Compact City planning theory will be conducted. There will be inspiration sought in another master thesis, "From Urban Sprawl to Compact City – An analysis of urban growth management in Auckland" by Joshua Arbury. Joshua graduated with First Class Honors from the University of Auckland in 2005. Since then Joshua has been working as a Consulting Planner at Auckland office and his post graduated studies focuses on Auckland's urban growth management strategies, population studies, health geography, urban planning and design, as well as environmental management. In the following, Joshua's report will been used as guiding tool through the theory of Compact City but where there is needed more profound references will be used.

> *"It has been suggested that a sustainable city must be of a form and scale appropriate to walking, cycling and efficient public transport, and with compactness that encourages social interaction. Other proponents have suggested forms that range from large concentrated centres, through ideas of decentralized but concentrated and compact settlements linked by public transport system, to strategies for dispersal in self-sufficient communities."* (Jenks, Elizabeth, & Katie, 2005, p.3)

The "Compact City theory" (from 1970) has in many cases been said to be one side of a coin where the theory of "Smart Growth" is the other. This is because both theories indicate and deal with the same issue, i.e. they are an urban planning and transportation theories that concentrate growth in the center of a city to avoid urban sprawl. The usage of the concepts are linked to two different continents i.e. Smart Growth in United States and Compact City in Europe. The concept of Smart Growth is often said to have more strongly normative connotations than the concept of Compact City but the origin is still the same.

2.4.2.1 Urban sprawl

The theory of Compact City differs greatly from the conventional urban planning development that has been used so widely in the Western World during the second half of the last century, i.e. urban sprawl. Urban sprawl of a city is now related to its consistent horizontal development, continually making rural areas to urban where the build-up is characterized by often isolated or scattered neighborhoods (leapfrog) or commercial strips with low-density, single-use (or high segregation of uses), lack of public spaces and automobile dependency. (Miller, 2004) Those kinds of neighborhoods are now known as having a negative influence on the urban life of a city as they tend to increase air pollution, create congestion problems due to increased commuting and lead to poorer public health and high infrastructure costs. The prolonged life of the concept of urban sprawl is due to a number of interconnected policy factors and lifestyle choices in the society. National investment policies, local government policies and public service investment policies contribute to the sprawl by constantly serving and promoting settlements in more rural areas of the city. This they do by e.g. providing rapid access to rural areas and subsidizing single-family housing, by constantly extending sewers and roadways to rural areas, by charging landowners in low-density areas the same fee for services as those in denser areas that are less expensive to serve and through poor land use planning. In addition peoples lifestyle choices, such as living in single-family homes, having automobile, working at low-rise workplaces, living in small communities with small local government where they are free from signs of poverty. (Carruthers and Ulfarsson, 2002) The pattern of urban sprawl becomes a vicious cycle as with the growth of a city and its economy, people and investors demand more living or built-up space, this again puts pressure on the politicians or elected government to e.g. lay more roads and infrastructure and by this the motivation to alter policies automatically becomes little to none . To maintain their position in the society the politicians then put pressure on the city planners to include the voters will and the snowball starts to roll and the concept of urban sprawl is prolonged. Urban development by the concept of urban sprawl therefore influences negatively the three ground pillars of sustainability, i.e. environment-, economy- and social development. (Carruthers and Ulfarsson, 2002)

2.4.2.2 Definition of the concept

Today it is common knowledge and generally recognized that a more compact city is more sustainable than a city where urban sprawl has been the main theme. This sustainability and reversal of urban sprawl can be gained by utilizing the concepts of compact city, i.e. to set focus on urban intensification, creating limits to urban growth, encouraging mixed-use development and placing a greater focus on the role of public transportation and quality urban design. Despite this clarity of the

compact city concept it is still highly subjective. Commonly there is a romantic vision linked to the concept but at a more professional level, a vast debate of its function. The more romantic vision of the concept is seen in the great attraction that many of Europe historic cities, due to their compact urban life (few roads and cars, landscape public spaces, gardens and trees), have on architects, planners, urban designers and visitors. Then there is this professional debate about if the concept is able to deliver on its promise of a more sustainable future. This argument is then about if such a radical change that the compact city concepts brings in the urban planning practice is manageable, if on an individual level urban sprawl is attractive.

> *"most people want to have their own homes in their own lots. The lure of a large house on a large lot, with good automobile access to facilities (even if they are located a long way away) is unsurprisingly attractive at the individual level, even if unsustainable at the city or regional level. This creates an unstable contradiction where on the one hand sprawl is encouraged through its attractiveness for individual homeowners and property developers….but on the other hand the resulting sprawl causes an almost endless list of problems for cities and regions as a whole"* (Arbury, 2005, p.17)

So the exact definition of the concept of a compact city is hard to define, but the most common is the one that say a compact city has a relative high-density and a mixed-use that is based on an emission-efficient public transport system that encourages walking and cycling while reducing car dependency. (Williams, 1999) As this fundamental definition of the theory indicates then the theory of Compact City has in many cases been used to reduce the use of private cars and to minimize the loss of open countryside. This makes the theory highly geared towards environmental benefits but that is not only what the theory is capable of. The theory is also socially sustainable because local facilities and services can be maintained and therefore accessibility to goods and services is more equitably distributed. The theory also take into account the importance of cultural activities and social interaction (increase in activity) and does not leave cities economy left behind as in densification and intensification lies new beginnings for cities businesses. (Williams, 1999) The theory of Compact City has all the abilities of being highly sustainable as it includes all the three fundamental pillars of sustainability.

2.4.2.3 How compact is compact

Despite the Compact City theory sustainability potentials the question left unanswered is the one of how compact a compact city should be.

Given the fact that the "compact city model" touches upon all the fundamental pillars of sustainability then it can be assumed that to have a city more compact, most urban growth will need to occur within existing city boundaries, i.e. cities shall be intensified (Williams, 1999). The compact city model is thus based around an increase in density of a city from its current levels. Though as straight forward as this could seem there is a disagreement between professionals in how best to obtain (or even measure) density in a city. (Arbury, 2005) This has resulted in a conflict or different work procedures when working with densification or intensification of cities and this being amplified by the differential in how far each country or city has reached in the work or process of densification. So the development of this compact city model obviously differentiates between countries where as Britain being the one with the most developed literature. (Arbury, 2005)

Increased urban density can be gained by e.g. develop previously undeveloped urban land, i.e. build-up of cities "brown fields" or redeveloping, change, extend, sub-divide and adapt existing building or sites. This mentioned disagreement makes it difficult to pinpoint which intensification should be encouraged and what should be avoided. High crime rate is often associated with high-

rise apartment buildings meanwhile low-rise buildings in a dense environment are associated with good livability and mixed-use of buildings is associated with increased activity density of an area i.e. an increase in the number of people living in, working in, or travelling through an area. Which form is used to get increased urban density is irrelevant if the purpose of compact city theory is gained but a method of "trial by error" is not acceptable. The danger lies in the possibility that the theory turns to its opposite, i.e. to have the citizens again wanting to leave the urban environment (returning to urban sprawl) because of its degree of pollution and overcrowding as was the case of the industrial cities of the 19th century. A high activity rate parallel with mixed-use development in a neighborhood can e.g. lead to its inhabitants experiencing crowded feelings, a feeling that a high density of dwelling will maybe not. (Arbury, 2005)

2.4.2.4 What is density!

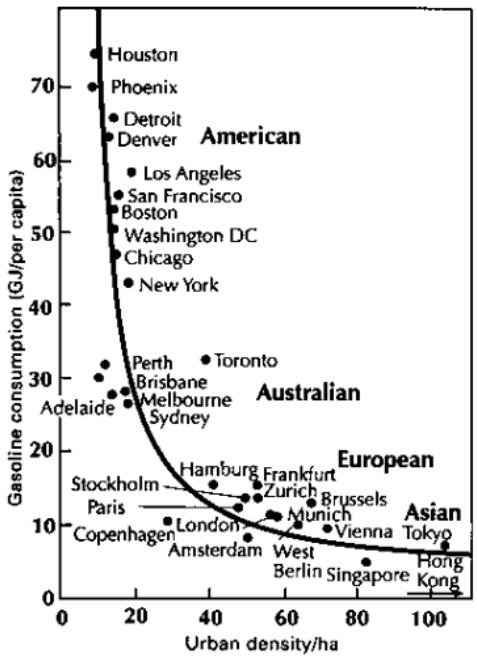


Figure 2-14: Urban density per capita vs. petrol consumption (Newman and Kenworthy, 1989)

At a global scale the perception of the compact city theory and the meaning of density do vary a lot. This is due to countries varied forms of urban development and their perception of what density is. As can been seen in Figure 2-14 cities in Asia normally have higher density than the ones in Europe and the ones in Europe have higher density then those in Australia and United States. It is obvious that the perception of density varies a lot between regions of the globe and the methods to be used in e.g. Asia will differentiate a lot from the ones used in e.g. the United States. So density refers to the intensity of use of land and is normally measured in terms of population density, or dwelling units per area and in general a population density of fewer than 25 people per hectare is considered 'low density'. There is though another way to measure density (or urban sprawl for that matter) which is by the city "floor area ratio", i.e. the ratio of the total floor area of building on a certain location to the size of the land of that location. In suburban areas where urban sprawl has been the case have often floor area ratio of less than 0,2, i.e. less than 20% of the total land area being occupied by buildings. In densely built urban areas this number can vary in range from 0,88 for townhouses right up to 5.05 for apartment buildings. (Arbury, 2005)

2.4.2.5 Critiques of the compact city

By the above, few principles can be made that cities shall take into account when starting a developing process under the name of the theory of Compact City. These principles are to: (London, 2011)

- Maximize the potential of sites
- Respect local context, history, building heritage, character and communities
- Strive towards and promote mixed land uses
- Encourage more people to take up the urban form (concept of compact city) of living
- Strengthen and direct development towards existing communities
- Resist automobile dependency and embrace more sustainable transportation nodes
- Be accessible, usable and permeable for all users
- Be sustainable, durable, adaptable and practical in terms of design, construction and land use

- Be attractive to look at and, where appropriate, inspire, excite and delight
- Respect the natural environment and biodiversity
- Address health and security issues
- Promote and facilitate local businesses
- Encourage community and stakeholder collaboration in development decisions

As stated before the theory of Compact City promotes sustainability and as a policy it seems to achieve this goal. It does not mean that in reality this is still the case as Williams (1995) pinpoints *"if intensification in the England is considered, a major contradiction emerges between the idea of the compact city in policy, and the reality of its experience"*. Williams (1995) continues by saying that at the *"outside the policy-making environment there is little consensus regarding the merits of more compact urban forms"*. The outcome of such radical change, to use the compact model in a planning procedure of a city, has not been proven or clarified yet. As it is today it is e.g. not proven that economic benefits will be gained by altering urban form and that higher densities will automatically result in reduced car usage or even that it will lead to improved social conditions for the inhabitants. In some cases the opposite had been the case and that today's policy makers can, in the "best sense" hope for sustainable outcome from the compact city model. The concerns are that the compact city model has been one dimensional, i.e. based on the environmental part of sustainability. (Williams, 1999)

2.4.2.5.1 Inhabitants acceptability

According to Cullingworth and Nadin (2002, p. 173) what also is *"missing from much of the debate is the question of the acceptability of increased densities (urban compaction)"*. As said earlier then it seems for many to be quiet desirable to get that house surrounded by a large lot with good automobile access. Cullingworth and Nadin (2002, p.173) continue by saying that surveys in United States (Housing Attitude Surveys) have indicated *"central urban dwellers to be much less satisfied than those in the suburbs, and these again less than those in rural areas"*. Greater part of the inhabitants demand houses with gardens though the demand for flats have been increasing (primarily one-person households, young and elderly inhabitants).

2.4.2.5.2 Jurisdictions of municipalities

Another critique of the compact city model or more exact on its usage is stated by Carruthers and Ulfarsson (2002, p.317). They state that individual jurisdictions may be able to limit their own growth but they cannot affect what happens to the region as a whole. By this they mean that *"as some communities wish to avoid growth, other seek to encourage it, with the same disregard for the impact on surrounding areas"*. So the critique is that if there is not a united desire in a region for playing the card of compact city the rivalry between adjacent communities about e.g. housing and commercial developments will increase the traffic congestion (the need for relocating and peddling) in the region.

2.4.2.5.3 Developers benefits

Carruthers and Ulfarsson (2002) also point out that it is rather profitable for developers to maintain urban sprawl and go against the concepts of compact city. Inner-city redevelopment cost more than development at the urban fringe (see paragraph 3.2.4.4.5 Fringe belts) and for the pocket of the developers it means a lot. All the new infrastructure costs are usually paid by the general public through rates and infrastructure costs and do not have influence on the aforementioned pockets of the developers. (Carruthers and Ulfarsson, 2002) In addition, developers can have great influences in communities and can put pressure on politicians, the politicians can then have great influence on

the policies of the communities concerning e.g. buildings-loans and prices of building sites, real-estate prizes and development matters in general.

2.4.2.5.4 Inhabitants influence (NIMBY)

The same can be said about the inhabitants of communities, through what have been called "nimbyism" or NIMBY. Inhabitants can have great influence on the development of their communities and as voters they can "push" the politicians to work in their favor. (Sigurðsson H. , Interview, 2011). NIMBY is what has been known as "not-in-my-backyard" syndrome of inhabitants and got into the planning practice in the late 20th century. According to Dear (1992, p.288) NIMBY in a plain language *"is the motivation of residents who want to protect their turf"*. More formally he says that *"NIMBY refers to the protectionist attitudes of and oppositional tactics adopted by community groups facing an unwelcome development in their neighborhood"*. The term could also be used to describe individuals, groups or minorities who advocate some proposal for the greater whole but oppose implementing it in a way that would require sacrifice on their part. Meaning that people tend to argue for or suggest some proposal in a community meanwhile saying that it shall happen or occur at some other location than near to their homes. So through the NIMBY syndrome inhabitants can have indirect influence on the urban development of a city and thus the usage of the compact city concept. Inhabitants, as said, can in form of voters "push" the local politicians to the degree that it affects the overall aim of a region concerning urban development matters. Cynically this connection between citizens movements and politicians behavior that derives from the NIMBY syndrome have been called NIMTOO, for not in my term of office. (Dear, 1992)

Though there are some doubts about the policies of compact city it is obvious that the urban sprawl that has been the norm in western urban planning policies the latter part of the last century or more cannot be left to grow bigger. Action must be taken to make urban areas more sustainable and the compact city concept could, for many cities, be the best choice. The compact city concept is complex and left for cities to mould further in their own benefits to obtain their sustainability norms. It is apparent that the concept differs greatly from the concept of urban sprawl and yet there are many issues left to be solved concerning its usage. The policy landscape of those two has been "mapped" by Dennis and Urry (2009), in their book After the Car. Their findings can be seen in Table 2-1 and will be the conclusion of this study of the theory of Compact City.

Difference between 'sprawl' and 'compact city'	
Sprawl	**Compact city**
Low density	High density
Zoned development	Mixed-use development
Segregation of functions for living, working, recreation	Integration of functions for living, working, recreation
Segregation of demographic and economic groups	Mixed-income communities
Car dependence	Predominance of pedestrians and cyclists
Disconnected public spaces	Interconnected walkable network of large- and small-scale public spaces
High-speed transport networks and increases road infrastructure	Minimized need for transport and planning for walking and cycling
Parking, buildings and freeways	Parks, landscaping an cycle paths
Minimum parking spaces	Parking spaces capping requirement
Sense of anonymity	Sense of community
US urban model	European/Asian model
Developed from about 100 years ago	Developed from about 9,000 years ago
Large scale developments	Neighbourhood-human scale developments
Superstores and big shopping complexes	Corner shops, local shopping areas, farmers markets
Mass housing and commercial/industrial districts	Capping of allowable space for commercial/industrial districts
Driven by market forces	Driven by vision and master plan
High energy	Low energy
High CO_2 emissions	Low CO_2 emissions

Table 2-1: Difference between the two concepts of urban sprawl and compact city (Dennis and Urry, 2009)

Sustainability has appeared and been incorporated in many urban planning theories and the theory of compact city is of no exception. A renewed focus on the importance of urban design has erupted through the ideology of New Urbanisim that also has strong links to the concept of compact city. (Arbury, 2005)

2.4.3 New Urbanism

In urban planning profession, design, has been an integrated part from the very start. Design have though been forgotten or left out in modern planning practice as urban planners have been focusing more and more on administrative and regulatory practices. According to Hathorne (2010), development of skills in urban design is the number one factor for a good urban planner to have today. Good skills in these matters *"contributes to the direct analysis of both the natural and built environments of an area as well as the means by which applying urban design principles can help in (re)defining and (re)shaping the area for more effective social, environmental and economic benefit for the community at large"*. (Hathorne, 2010, p.516) It is thus essential in urban planning practice, to have urban planners to develop skills and understanding of the principles and usage of urban design philosophies. Only by that, the principle of sustainability is to be gained in its full spectrum at a local and community level. These design principles and philosophies are highly integrated into the theories of New Urbanism.

New Urbanism as a concept emerged in the late 20th century (approx in 1980). It kept growing in size and subject matter and in 1993 it marched into the planning practice as a movement when The Congress for the New Urbanism was established. The concept of new urbanism is not a new one and its fundamental theory is a combination of many concepts inside the urban development practice.

2.4.3.1 Precursors of New Urbanism

New urbanism is nothing new but rather a merger of many concepts that were floating around in the drift of the urban planning practice that characterized the years after World War II. The theory of New Urbanism seeks inspiration in Jane Jacobs futuristic visions in 1961, the design concepts of Duany and Plater-Zyberk, traditional neighborhood development (TND) and the, Calthorpe and Kelbaugh, concept of transit oriented development (TOD). (Grant, 2009)

2.4.3.1.1 Jane Jacobs visions

> *"Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody."* (Jacobs, 1961)
>
> *"The more successfully a city mingles everyday diversity of uses and users in its everyday streets, the more successfully, casually (and economically) its people thereby enliven and support well-located parks that can thus give back grace and delight to their neighborhoods instead of vacuity."* (Jacobs, 1961)

Jane Jacobs passed away in April 2006 and will be remembered for her 1961 writings i.e. the book called The Death and Life of Great American Cities. Jane Jacobs had no formal training as a planner but in her book she revealed her then futuristic visions about cities build-up, how cities should have mixed usage, connected street patterns, walkable communities and public participation. (Grant, 2009) Her attention in the book was on what works and doesn't work in city life, visions that today seem like common sense to planners, architects, politicians and even the general public. Her urban ballet vision of placement of sidewalks, the uses of front stoops, the virtues of old buildings and mixed uses, the presence of children, the need for short blocks and neighborhood parks, the citizens role in protecting the street and the city livability (McClay, 2011) are highly integrated to the theory of New Urbanism. It is thus stated that for New Urbanism, Jane Jacobs visions makes all the differences between successful and an unsuccessful urban setting.

2.4.3.1.2 Traditional Neighborhood Development (TND)

Figure 2-15: Representation of Traditional Neighborhood Development (TND) (Traditional Neighborhood Development (TND), n.d.)

Traditional Neighborhood Development (TND) or neo-traditional town planning is a concept that advocates complete communities, mixed-use town centers and traditional building types. (Grant, 2009) This concept challenged the urban development characterized by the 20th century i.e. subdivision/single-use, low-density and auto-dependent suburban development by promoting instead higher densities, mixed uses, provision of public transit, accommodation of the pedestrian and the bicyclist, and a more interconnected pattern of streets. (Southworth, 1997) The Traditional Neighborhood Development (TND) takes inspiration from the image of the small classic town and villages of the past that were walkable, had clear community structure, a mix of uses and housing types, harmonious design of its building and spaces, equal importance of public and private spaces and a mixture of work related buildings and homes. With these principles and inspiration the intent of the TND concept is to be a guiding tool in revitalizing existing town centers and neighborhoods or build new ones at transit nodes and in other locations. Its primary strength lies thus in its ability to blend into, improve and respect the location where it is practiced. (Traditional Neighborhood Development (TND), n.d.)

The following are commonly found in areas built or re-built by the principles of TND: (Traditional Neighborhood Development (TND), n.d.)

- Parks, schools, civic buildings, and commercial establishments located within walking distance of homes
- Residences with narrow front setbacks, front porches, and detached rear garages or alley-loaded parking
- Network of streets and paths suitable for pedestrians, bicyclists, and vehicles
- Narrower streets with crosswalks, streetscaping, and other traffic-calming measures
- In-scale development that fits the local context
- Buildings oriented to the street with parking behind

2.4.3.1.3 Transit Oriented Development (TOD)

Figure 2-16: Representation of Transit Oriented Development (TOD) (Design science news, n.d.)

Transit Oriented Development (TOD) sometimes called Pedestrian Pocket or Pedestrian Oriented development is a concept that suggests that designers and planners use access to public transportation as an organizing mechanism for determining land uses and densities. (Grant, 2009) Its concept is similar to Traditional Neighborhood Development (TND) of walkability and convenient access but differs when it comes to choice of architectural form and historical styles. (Kelbaugh, 2002) The main distinguish between the concepts lies though in TOD usage of transit nodes. A part of the TOD concept is to design neighborhoods or "pockets" that are located closed to transit stops of public transportation that again link those neighborhoods to the rest of the city or the

region. The aim for those "pockets" is to be highly self-reliant so a reduction in travel miles by car can be obtained. The design does not totally reject car usage but aims to minimize it by encouraging inhabitants to walk, cycle and use mass transit (or car) to travel to transit nodes that take them further in their journey. (Southworth, 1997) Each "pocket" is similar in size, 30 to 150 acres (1406 m^2 to 7028 m^2) but can differ in architecture and is located approximately in 0,4 km radius of a central transit stop for a bus or rail system. (Kelbaugh, 2002) As an example Denmark's capital, Copenhagen has followed these principles quite successfully in its urban development (called Fingerplanen) and there they have now a well functioning network of buses and railways where people tend to select their residence relative to these transit nodes.(Miljøministeriet, 2007)

As stated, New Urbanism is nothing new then but rather a merger of many urban design principles (Calavita, 1994; Southworth, 1997; Kelbaugh, 2002) that where hovering around the planning and academic environment in the late 20th century. Even these principles are also highly inspired by earlier principles like the ones by Ebenezer Howard, Garden city of tomorrow and Le Corbusier visions for Contemporary City and The Radiant City (see paragraph 2.1). Most of these principles have in common that they build upon something that now is known as Sustainability but they all use slightly different approaches to get there. In the middle of this then vibrant urban development setting few designers, architects and planners found the need for make a one united principle that became what is known now as the theory of New Urbanism. (Grant, 2009)

2.4.3.2 Principles of New Urbanism

In 1993 the theories of New Urbanism came alive for real when The Congress for the New Urbanism was founded by Peter Calthorpe, Andrés Duany, Elizabeth Moule, Elizabeth Plater-Zyberk, Stefanos Polyzoides and Dan Solomon. The Congress for the New Urbanism is a leading international organization promoting new urbanist design principles. (CNU, n.d.)

As said then the New Urbanism has emerged as an answer to last century's high modernism and postmodernism approaches to urban design and planning and is highly influenced by the urban planning of both sides of the Atlantic Ocean i.e. Europe and United States. (Furuseth, 1997), p.203 This conventional suburban development and sprawl that has been practiced in (mainly) the Western World since World War II has, according to Langdon (1994), p.2, *"been bad for us as individuals and as a society"*. The Congress for the New Urbanism is now in forefront for this growing rebellion against this conventional suburban development and according to its founders it is to remedy the faults of the 20th century planning practice. (CNU, n.d.)

2.4.3.2.1 The mission

> *"Whether it be in brownfields, emerging growth areas, established cities, or small town suburbs, New Urbanism reinforces the character of existing areas in making them walkable, sustainable, and vibrant, revitalizing and energizing communities to their true potential. The principles of New Urbanism are also central to making whole regions more livable, coherent and sustainable."(CNU, n.d.)*

The vision of the Congress for the New Urbanism is to reinforce the relationship between the built environments its physical and social society along with preserving the natural aspects of the surroundings. By reversing the urban sprawl tendency of cities the mission is to lead cities future urban development into more sustainable one by integrating diverse, walkable, transit-served, less automobile dependent communities. According to the Congress for the New Urbanism (CNU, n.d.) that will only be done by tackling the following critical issues at local level (neighborhood, city or regional):

- **Sustainability:** Promote the relationship between urbanism and sustainability and challenge practitioners to design for the reduction of greenhouse gas emissions.
- **Transportation:** Reform policies and standards in transportation planning and design to focus transportation investments on adding economic and community value instead of on vehicular movement.
- **Regionalism:** Create a framework for regional development to address large-scale issues of quality of life, justice, health, transportation, education, planning, and sustainability.
- **Comprehensive Plans:** Develop models of comprehensive plans that build economic health, encourage infill development over peripheral expansion, and allow for harmonious evolution of neighborhoods.
- **Affordability:** Expand new urbanisms' role in the creation and preservation of affordable housing by providing a broad range of housing types and price levels within a mixed-use, compact setting.
- **Financing and Entitlement:** Restructure financing and entitlement processes that obstruct urbanism.
- **Accessibility and Visitability:** Incorporate accessibility and visitability within New Urbanist projects to create neighborhoods and transit services where residents can function throughout their lifetime.

By doing so, a creation of more enduring human-scaled neighborhoods can be achieved, neighborhoods which in sharp contrast to sprawl can bring destinations within reach where shared space are celebrated and where frequent encounters between citizens can happen. The red line is that the principles of New Urbanism promotes itself of being capable of repairing the damage already done to our neighborhoods, cities or regions through environmental degradation and misguided infrastructure projects. Through compact urban form and change in urban development focus, efficient use of infrastructure and preservation of habitats and farmland the provided concepts of New urbanism and the tools of the Congress for the New Urbanism have all the abilities to bring about highly sustainable solutions to the modern urban areas. (CNU, n.d.)

2.4.3.3 Critiques and restrictions of the New Urbanism

As a relative "new" concept, the theory of New Urbanism has received a vast amount of criticism. The critiques of the concept are both on the concept itself as well as if the modern society is prepared or willing to face or embrace the guidance that it promotes. According to Grant (2009) several scholars who have evaluated New Urbanism suggest that its theoretical claims will be difficult to implement under current market and political conditions and evaluation of its practice have come to mixed conclusions and sometimes contradictory findings. (Grant, 2009) and Talen (2010) also points out in her theses that the New Urbanist concept of walkable and mixed-income neighborhoods has rather developed into neighborhoods for the rich than being affordable to people of modest means. Ellis (2002) pinpoints that a small scale urban development of New Urbanist projects is not possible if a reduced automobile dependence is to by gained, it has to be on the regional level.

New Urbanism have also been labeled or accused of being "nostalgic", to have a desire to take areas and return them into a less complex state in an imaginary past and fail to confront the reality (the fantasy of returning to the small-town life). According to Ellis (2002, p.268), to accuse New Urbanism to be a nostalgic is though only a *"debating manoeuvre rather than a serious argument"*. More heavily, the New Urbanism has been criticized of ignoring the social and economic realities that the world is facing today i.e. the contemporary conditions of population, social changes and changes in commerce and transportation. Many critiques follow, such as that the concepts put

constraints on architects, it lacks urbanity and denies cultural differences. According to Ellis (2002) the concept of New Urbanism has both focus on and strategies that can well stand up to its criticism and that many of the criticism display characteristic flaws. As an addition Kelbaugh (2002) points out the necessity of this criticism for the theory as a whole as it is both natural and healthy in an open society to criticize something that is "neo" or new.

If it is possible to say that something is "new" about the theory of New Urbanism then it lies in its totality, i.e. it attempts to promote a unified design theory for an entire region. (Kelbaugh, 2002) The New Urbanism serves thus as an umbrella term for a comprehensive regional strategy (Kelbaugh, 2002) and as a closure to this study of the theory of New Urbanism, Ellis's (2002) words will be the one that will be left standing.

> *"In the end, the New Urbanism cannot satisfy all of its critics, because they demand contradictory changes. The left faults New Urbanism for not producing a radical critique of capitalism, while right-wing economists attack its support for regional planning. Architects and planners criticize New Urbanism for not being sufficiently 'urban', while devotees of sprawl oppose New Urbanist projects because the densities are too high. Perhaps New Urbanists have found a reasonable and principled middle ground between these extremes, and one that makes actual building possible."* (Ellis, 2002, p.283)

2.5 Future development and visions

What will happen in this century is unknown and open for everyone to predict. In the following paragraphs an inspiration or if one could say knowledge is gathered from the two books After the car by John Urry and Kinglsey Dennis and Sustainability and cities: Overcoming automobile dependence by Peter Newman and Jeffrey Kenworthy. The aim is to get a feeling for what will happen if, like Urry and Kingsley put it, "business continues as usual". Where will the world head in the future if there will not be any changes in our behavior and the way we humans neglect and mistreat our local and global environment. This paragraph will thus indicate what will happen in the future if the sustainability agenda will not be successful.

2.5.1 After the car

(Book by John Urry and Kingsley Dennis)

In the book After the Car by John Urry and Kingsley Dennis the authors voice their opinions and speculations of what the futuristic scenario for the car and the car usage will look like. The authors share the opinion of the Intergovernmental Panel on Climate Change (IPCC) (and Al Gore's PowerPoint hit "An Inconvenient Truth" for that matter) when they say that the climate change of the world is manmade and does not have any connection to natural periodical temperature fluctuation in the earth atmosphere. This they support by saying that it is undeniable that the global average air and ocean temperatures are rising resulting in widespread melting of snow and ice and rising average sea levels. This is happening due to the rise in greenhouse gasses in the earth's atmosphere that the authors conclude are *"from "non-natural" causes, i.e. effects of human activities*". (Dennis and Urry, 2009, p.4)

> *"So overall consequences of such unique changes are global and, if they are not significantly reduced, they will very substantially reduce the standard of living, the capabilities of life around the world and overall population as catastrophic impacts begin, starting off in the 'poor' south. The planet will endure, but many forms of human habitation will not if business continues as usual."*(Dennis and Urry, 2009, p.8)

If as the authors say *"business continues as usual"* planet Earth and its societies and life forms will be changed dramatically in this century. Sea-level will rise and levels of greenhouse gases and world temperatures will significantly increase. This unbalance will not return the earth's equilibrium in the near decades or centuries and it will influence all, but starting off in the "poor" south.

They continue and say that if no significant reduction in the worlds high carbon system is gained, the greenhouse gases could treble by the end of the century. Transportation in the world accounts for 14% of total greenhouse gas emission and it is expected to double by 2050. It is the second fastest growing source of carbon emission and it is therefore vital to change or turn around this system of the car.

If it will be because of the scarcity of oil (and the wars and political and civil unrest parallel to that), through climate change collapse or behavioral changes of the humans that the car and its system will end, at some stage during this century. This will lead to, according to the authors, a rise of a new system or model that is "after the car".

> *"at some point the present fossil fuel car system will turn out to be a fossilized system"* (Dennis and Urry, 2009, p.129)

The system of the car as we know it today is becoming ever more popular with each new generation. This dominant culture form that the car is, represent for many the "good life" and mobility. The car has grown into becoming a symbol and it reflects the owner personality and his status in the society. Thus today a car can indicate the owner's reliability, sexual success, career achievement, freedom, family and masculinity but one of its more new property is that it offers the owner sanctuary, office, a home from home or a zone of protection. This new property of the car will maybe be one of its most desirable elements in the future.

As from 2007 more people lived in cities than in rural area of the globe, *"the world has gone urban".* (Dennis and Urry, 2009, p.22)

> *"The twentieth century witnessed the rapid urbanization of the world´s population, as the share living in cities rose from 13 per cent (220 million) in 1900, to 29 per cent (732 million) in 1950, to 49 per cent (3.2 billion) in 2005. The UN report forecast that 60 per cent of the global population will live in cities by 2030....today´s cities consume three-quarters of the world´s energy and are responsible for at least three-quarters of global pollution."* (Dennis and Urry, 2009, p.22-23)

This change in living pattern can be the trigger to alternating of the system of the car. It can be that in the future the car and its modern possibilities and functions will not be as desirable. According to the authors it could be that in the future it would be impolite or rude to drive yourself down a highway and that a petroleum driven car will only be for the story books.

> *"The seamlessness of the car journey makes other modes of travel seem inflexible and fragmented."* (Dennis and Urry, 2009, p.40)

The main word in this statement is "seem" as the car is a wolf in disguise as its flexibility does not come without a price. The car system does create distances and coerces patterns of life. According to the authors it does separate home, work, business and places of leisure that historically were close together and therefore producing lengthy commutes into and across the city and stimulating the growth of suburbs. (Dennis and Urry, 2009)

Figure 2-17: Interrelated changes that could tip the car system into new "post-car system" (Velo-mobility in CPH, 2011)

The system of the car i.e. humans (drivers, passengers, pedestrians), machines, materials, fuel, roads, buildings and cultures will change in this century. According to the authors some technical, economic, policies and social changes will "tip" the car system into a new "post-car system". These changes, as can been seen in Figure 2-17 are all interrelated and could lead to tipping of the car system as we know it today. As an addition to these possible changes the authors also pinpoint the growing importance of the virtual world and that the need for actually being physically at a meeting or at certain place will not necessary be the same in the future as it is today. (Dennis and Urry, 2009)

The book gives three possible scenarios for the year 2050. These scenarios gives the writer three different development possibilities of the future societies and the living conditions on the planet. They have in common that they give some depressing futuristic prophesies for social life in general, that support the complexity of the issue, i.e. what is the future of the car system.

> *"We have thus indicated that the future of the 'car' is not a small question and issue….How the issue of personal mobility is dealt with will in part determine whether and how people live their lives down the line, in small-scale localism, in a Hobbesian war of all against all, or in Orwellian systems of digital surveillance. The twentieth century's free lunch has resulted, after a decade of global optimism in the 1990s, in some hugely bleak dilemmas for the twenty-first century. There are, we might suggest, no good outcomes after the car. It and its high carbon friends would seem to have done their best to leave little standing even as they themselves may disappear from view."*
> (Dennis and Urry, 2009, p.164)

The author's three possible outcomes or scenarios in 2050 are called Local Sustainability, Regional Warlordism and Digital Networks of Control.

Local Sustainability scenario draws a picture of a post-peak oil society. The car has become a luxury item for the richest, and thus it creates conflicts and resentments of those less fortunate. The societies get smaller, less populated and more compact and the way of living will be highly altered from what it is today.

> *"This would involve some dramatic global shift towards lifestyles that are much more intensely local and smaller in scale. Friends would have to be chosen from neighboring streets, families would not move away at times of new household composition, work would be found nearby, education would be sought only in local schools and colleges, the seasons would determine which and when foodstuffs were consumed, and most goods and services would be simpler and produced nearby"* (Dennis and Urry, 2009, p.149)

This scenario is introduced as being "possible" but not "probable", that with respect to the significance that the effect of climate change and peaking of oil will have on the future, the next scenario will be more probable.

Regional Warlordism scenario draws a picture of post-mobility pattern and an erosion of the social and moral foundation of civilization as we know it today. This scenario is reminiscent of the middle-ages i.e. where each town or region represents a fortress where travelling on the outside will be combined with high risk. Each fortress would fight for and defends what is left of their local natural resources of oil, gas and water as climate change and intermittent wars lead to breakdown of many of the twentieth century long-range system of energy, mobility and communication.

> *"System of secured long-range mobility would disappear except for the super rich. Rather like living in mediaeval times, long-distance travel would be extremely risky and probably not undertaken unless armed. The rich would travel mainly in the air in armed helicopters or light aircraft. Each warlord dominated region would potentially be at war with its neighbors, especially for control of water, oil and gas. With extensive flooding, extreme weather events and the break-up of long-distance oil and gas pipelines, these resources would be contested and defended by armed gangs"* (Dennis and Urry, 2009, p.152)

This scenario indicates that the "global forces" could find the features of climate change attractive with what it could bring to "them". The last scenario describes how the system of the car could "go digital" and how that could jeopardize the human freedom.

Digital Networks of Control introduces how the existing car system could be changed into what is called "organic model".

> *"Such an organic model represents a return to the form of traffic landscape found before the car system took over and monopolized most roads and which forced other road users to seek protection within separate zones (pavements, cycle tracks, pedestrianized zones)."* (Dennis and Urry, 2009, p.156)

This scenario would mark the end of private owned cars and publicly owned, managed and timetabled buses, trains, coaches and ships. Instead this organic model will consist of slow-moving micro-cars, as well as bikes, hybrid vehicles, pedestrians and mass transport.

> *"This organic digital system, commencing in some societies in the rich 'north', would consist of multiple, dense forms of movement of small, ultra-light, smart, probably battery or hydrogen-based, deprivatized 'vehicles'. Flexibilized travelling would involve accessing such small, light mobile pods as and when required, Electronic regulators embedded in lampposts and in vehicles would regulate access, organize price and control the vehicle speed. Some such vehicles would be driverless. The*

> *movement of vehicles would be electronically and physically integrated with other forms of mobility."* (Dennis and Urry, 2009, p.156)

The idea is that this organic model would include an electronic coordination between motorized and non-motorized transport, "smart cards" will control access and the payment for travel and software systems will "intelligently" work out the best means of doing tasks, meeting up or getting to some place or event.

This scenario also includes the vision that cities have to be more densely populated and urban areas will get more integrated. By this, inhabitants will have to live in much closer relationship to each other than is the norm today.

As said the author's three scenarios for 2050 give rather depressing visions for the planets future. This is because, according to the authors, the twentieth century's unprecedented energy production and consumption paid little attention to future generations. By ignoring imminent threats, observations and signs and letting the system of the car grow to what it is becoming, the past generations have made decisions that will certainly reduce the future generation's choices.

2.5.2 Sustainability and cities: Overcoming automobile dependence

(Book by Peter Newman and Jeffrey Kenworthy)

In the past sustainability was mostly defined at the global and national level. Cities and sustainability should though be in the 21st century and in the future an unbreakable whole or a unity. In the book Sustainability and cities: Overcoming automobile dependence by Peter Newman and Jeffrey Kenworthy the authors view this opinion of theirs that cities are a necessary focus for the global sustainability agenda. Throughout the book the authors examine this urban aspect of sustainability issues and the links between transportation and land use.

> *"Cities must change, but the historic quest for human achievement through urban civilization will go on. The great challenge for our cities is that they must now take seriously the quest for sustainability. Cities can be more livable, more human, more healthy places, but they must learn how to do this by simultaneously using fewer natural resources, creating less waste, and thus impacting less on the natural world. How this can be done is the theme of this book."* (Newman and Kenworthy, 1999, p.17-18)

It is stated in the book that there is a need for fundamental changes that involve a different approache to the nature of the urban system. In the following the central findings of how this should be done will be presented through three subcategories, fundamental changes, the present facts and the future vision.

2.5.2.1 Fundamental changes

> *"transport energy use per capita generally declines as city size increases"* (Newman and Kenworthy, 1999, p.14)

Cities can be looked at as metabolic models where inputs and outputs should be in a balance so that a satisfactory digestion (sustainability) is gained. (Newman and Kenworthy, 1999) These models (cities) also have to be of the right size so good efficiency of e.g. public transport systems, waste treatment and recycling is gained. Just like ecosystems in the nature, cities are thus constantly trying to get more efficiency and thus constantly growing. *"Cities can, of course, choose not to become more efficient as they grow"* and *"many data actually indicate that for economic purposes an optimal city size would be larger than any we now have"*. (Newman and Kenworthy, 1999, p.14-16)

"The driving force behind the growth of cities is human opportunity". So everything is related in one way or another, the human quest, the process of civilization, the development of human society, is all about the growth of cities and the diversity of opportunities in cities continues to be their main attraction. (Newman and Kenworthy, 1999, p.17)

ccording to the authors, cities are shaped by three dominant forces, i.e. Transportation priorities, economic priorities and cultural priorities. **The first priority** is transportation; people do not like to commute more than in average 30 minutes. Throughout the history three types of cities have emerged, first the walking city, then the transit city and finally the automobile city. Most modern cities (in the western world) contain some elements of all three types and the last one, being the offspring of the urban development of the late 20th century. **The second priority** is economics. Economics in the past shaped cities to become two types, high-density ("traditional") cities like the ones in Europe and low-density ("new frontier") like the ones in North America. High-density cities used their wealth in to industrial plant and the low-density used theirs in suburban infrastructure. Thus these two city types grew its capital from two different sources, one from industrial activities and the other from service for the suburbs. These two types of cities have merged in latter times, a development that has led to high infrastructure costs that is the essence of the present sustainability problem. Economics in the future, despite the information and telecommunication technology will depend on creativity and creativity flourishes where people come together face-to-face. Thus cities are once again concentrating in the central business district or inner areas as well in a series of nodes. Therefore these latter developments of cities are not working against sustainability. **The third priority** is culture. Culture plays a great role in shaping cities, the urban culture in England is not the same as the one in Australia. "Global youth culture is increasingly very urban rather than suburban, thus providing a cultural opportunity to challenge the assumption of car-dependent suburbs as the only future for our cities". (Newman and Kenworthy, 1999)

According to the authors these three forces mentioned above do not necessarily lead to the making of Auto city but instead can in many cases help to create nodal sub centers.

Newman and Kenworthy (1999) agree with Dennis and Urry (2009) that climate change of the world is due to the overwhelming and disregarded usage of the humans of the earth resources. They say that we the humans have been living through an era (1930s/40s-1980s/90s) that is called the "golden age of oil" and that we are living or are just passing the highest oil production point. That already in 2050 about 80 percent of the oil reserve will be consumed like Figure 2-18 shows.

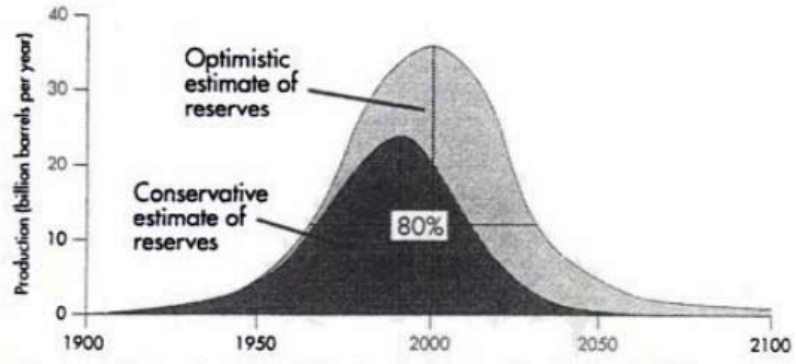


Figure 2-18: The cycle of world oil production (Newman and Kenworthy, 1999)

It is stated in this correlation that oil supplies will fade out *"the world's oil is running down, it is not "running out" in the popular conception whereby we suddenly have no oil"*. (Newman and

Kenworthy, 1999) Associated to this and the statement that *"no other fuel option has anything like oils energy profit ration"* (Newman and Kenworthy, 1999, p.50) the fuels of the future will be expensive.

According to Newman and Kenworthy (1999) the automobile appeared at first to offer freedom in space and time – to live anywhere in a city and get quickly to all urban destinations regardless of location. This freedom was actually never truly achieved, *"the Auto City "dream" soon became a "nightmare""*. The automobile as a thing is good for most matters but its usage is now linked to increasing number of economic and social issues. This freedom over space and time that the car gives us undermines community and *"thus the problem is seen to be not the automobile in itself but an overuse of and dependence on it"*. (Newman and Kenworthy, 1999, p.60)

Los Angeles and many other cities have showed that building more roads will not give increased economic growth and end congestion problems. (Newman and Kenworthy, 1999, p.55) Data show that the costs of each driven kilometers of car is much higher than for any other transportation mean. (Newman and Kenworthy, 1999, p.56-57) despite that the car dependence is hard as the user is addicted to it but additional factors are involved in its continuity:

- The whole society have to pay for car usage and its consequences, not the users directly
- The funding for road expansion is seen as economic, normal, and necessary, while rail expansion is generally seen as uneconomic, outdated and unnecessary.
- The subsidy to automobiles is hidden, but for transit it is called a deficit and is fully public.
- Funding for road expansion generally comes from government grants; rail expansion is rarely as generous and requires special loans, private money, or special taxes.
- No secure funding to support bicycling or walking is available, or it is seen as too minor to worry about.
- Infrastructure subsidies and financial institutions subsidies and heavily favor new land development and Greenfield sites

The automobile dependence is an urban sickness facing cities the world over and (Newman and Kenworthy (1999) p.60 define it as *"a situation in which "a city develops on the assumption that automobile use will predominate so that it is given priority in infrastructure and in the form of urban development"*. Freeways or highways are a love hate relationship, most people hate them but everybody want to minimize their travel time by travelling on them.

2.5.2.2 The present facts

The findings here above reveal that the patterns of transportation infrastructure and land use in cities around the world are highly automobile dependent where high car use, high provision for automobiles, and scattered low-density land use are combined.

According to the authors *"there appears to be no obvious gain in economic efficiency from developing automobile dependence in cities"*. (Newman and Kenworthy, 1999, p 125) The breakdown between private and public transportation shows that an overwhelming proportion of transportation energy is consumed by private transportation in most cities. Bus and rail transit is much more efficient and show thus more energy-efficiency. By using these as well as walking and bicycling reduces automobile usage and reduces unnecessary mobility in general. By reducing mobility, economic and environmental advantages will emerge in automobile-dependent cities. (Newman and Kenworthy, 1999, p 80)

In the book Newman and Kenworth (1999) compare different economic and environmental indicators for U.S., Australian, Canadian, European and Asian cities respectively. In the following the main findings will be revealed:

Modal Splits

U.S. cities are highly automobile-oriented. European cities, on average, have 23 percent of their total passenger transportation task accounted for by public transport meanwhile the U.S. cities have in average 3 percent. (Newman and Kenworthy, 1999)

U.S. cities have the least proportion of workers traveling by foot or bike to work, followed closely by Australian and Canadian cities. European and Asian cities have higher percent rating in these matters and Copenhagen and Amsterdam are the bicycle cities where about 35 percent walk and mainly bike to work.

European cities have done much to encourage the return of walking and cycling through innovative pedestrianization, traffic-calming schemes, and other initiatives, walking and cycling are being squeezed out of Asian cities. (Newman and Kenworthy, 1999)

Only 43 percent of work travel is by car in European cities (39 percent by public transport and 18 by walking and cycling), the U.S. cities score poorly with 9 percent of work trips by transit and 4,6 in walking and cycling i.e. approx 86 percent by car. Asian cities have in average 45 percent of travel to work by public transport, 19 percent by walking and cycling and thus36 percent by car.

Average distance of work journeys are about 33 percent shorter in European cities and 47 percent shorter in Asian cities compared to those in U.S. and Australian cities.

Transit leverage (multiplier)

Calculation shows that when transit replaces car travel, it does better than substitute 1 kilometer of car travel for 1 kilometer of transit, it could be anywhere from 8,6 to 12,0 kilometers of car travel that are replaced by 1 kilometer of transit.

The reason for this multiplier effect include the following: (Newman and Kenworthy, 1999, p.87)

- If a good transit option becomes available, then people and businesses adjust by locating nearer to the line; thus transit shortens travel distances.
- People taking transit often combine several journeys in one – for example, picking up groceries on the way home from work, which in a car-based suburban setting would likely mean separate car trip.
- Households that switch to transit often give up one car and thus have less car use because the choice of using a car is less available.
- Transit users often find that the habit of walking or biking to station flows into the rest of their lifestyle

As a concept, Transit leverage (multiplier) suggests that by building new transit lines into automobile-dependent suburbs and creating urban villages around the new stations, a significant change in travel patterns could occur.

Transit service levels

Obviously, the amount of transit service is not as critical as its quality if a city is to attract high transit usage. Buses that wander long distances around scattered suburbs to pick up passengers can rarely compete with the car, but rapid electric rail from one dense subcenter to another certainly can. These data are important in discussions of the viability of transit: increasing levels of service will no doubt improve patronage, but in automobile-dependent cities it is necessary to do a lot more than just improving service. There needs to be a holistic approach that incorporates urban form, the quality of service (including its speed), and the selective supply of infrastructure for automobiles versus transit. (Newman and Kenworthy, 1999)

Road supply and parking

U.S. and Australian cities provide about three to four times as much road per capita as European cities and nearly six to eight times as much as Asian cities. Central city parking does not have quite such a large variation across the city grouping.

Traffic and transit speeds and travel time

Only rail based transit can compete with the car in speed. But more speed is not as sustainable as less speed traffic. *"there is clearly less fuel use per capita in cities in Europe and Asia, with their low average traffic speeds, compared to the United States and Australia, with their high average traffic speeds"* (Newman and Kenworthy, 1999, p.92) In term of both economic and environmental aspects of sustainability, it is possible to question the implementation of large-scale capital projects [built e.g. more highways] that continue to provide ever faster means of car travel across cities. It appears that contrary to their justification in terms of travel time saved, all they do in the end is allow a city to disperse farther outward. Road building does not save fuel or travel time or reduce emissions.

Urban form (density)

Many studies have shown that the intensity of development in a city has a highly significant effect on travel distances and modal splits.

The overall shape of the U.S. and Australian Auto City is of low density in residence and businesses, with European cities generally being three to four times denser. Canadian cities fill an interesting niche between the extreme low density of the U.S. and Australian cities and the medium density of the European cities. The Asian cities are even more extreme, with densities some twelve times those of the U.S. and Australian cities.

One of the significant differences between the U.S., Australian, and Canadian auto-dependent cities and the more transportation-balanced European and Asian cities is that the former have central cities that have become areas of very high job concentration with generally few residents, while the latter have a much better balance between central city jobs and residences. (Newman and Kenworthy, 1999)

High-rise office block is a common sight in most central city areas. Job density profile of central city areas are thus often high but it is higher in the U.S., then cities of Asia and the European city centers. The sharpest contrast between job densities between different areas of a city is in Asia, then U.S. and then in Europe as there the main occupation areas seem to be more spread.

In general the U.S. and Australian central cities have low population density, then comes the European ones and filling the gap are the Canadian central cities. Asian central cities have a special status having population density far beyond other countries of the world. This gives far greater opportunities to access central business district (CBD) jobs by foot and bicycle in Asian (and also European cities) than those in U.S., Australia and Canada.

Inner city and outer area density

The inner city is the pre-World War II city area. In order to reduce travel it is ideal to have job densities roughly similar in their pattern of distribution to population density. Inner-city job densities follow the same overall patterns of increased density, from U.S./Australian cities, through Canadian, European, and Asian cities. However, U.S. inner-city job density is significantly lower than its population density, reflecting the more advanced dispersal of work in the U.S. away from the traditional population concentrations towards suburban locations. By contrasts, Australian cities have somewhat higher inner-city job density than population densities, in Canada and Europe the two are more or less equal, and in Asia both are very high, with population densities some 30 percent higher than job densities in inner areas. (Newman and Kenworthy, 1999)

Job density in outer areas of European and Asian cities follow patterns similar to population density, with much higher densities than U.S., Australian, or Canadian cites.

Density and transportation

Density patterns are obviously closely linked to transportation and therefore energy use as can been in Figure 2-19 and Figure 2-20.

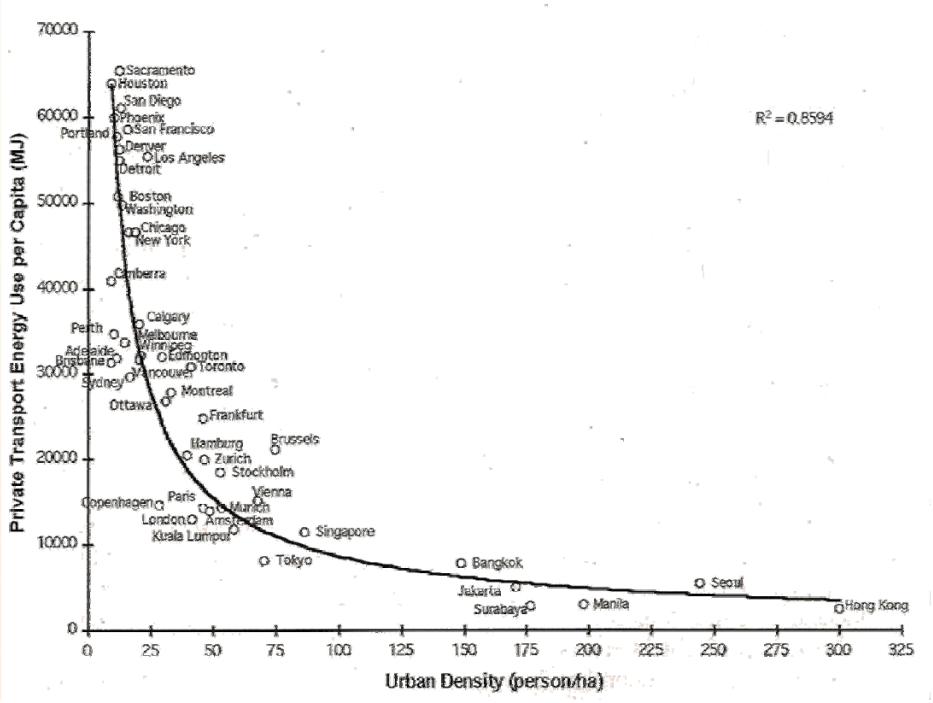


Figure 2-19: Energy use per capita in private passenger travel urban density in global cities (Newman and Kenworthy, 1999)

The graphs in Figure 2-19 and Figure 2-20 show that denser cities seem to have less transport energy use per capital. There seems to be a critical point, about 20 to 30 persons per hectare where cities start to develop automobile-dependency. This graph also shows how vital it is to stop urban

sprawl if not only for ecological reasons as too many cities are turning into auto cities with great dependency on the car. The graph in Figure 2-19 shows data for metropolitan areas but the same pattern is seen for other parts of cities. There can been seen in Figure 2-20 that with increased density that is often linked to central areas the energy usage per capital is lower than in outer areas where density is low.

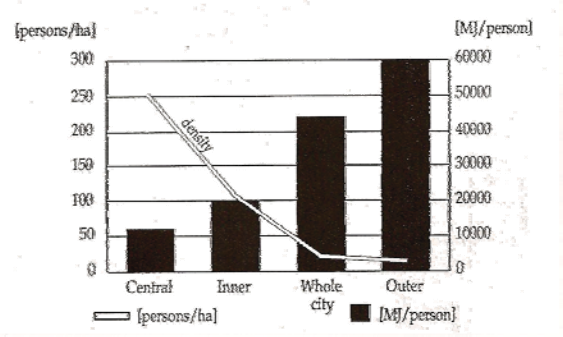


Figure 2-20: Gasoline use per capita versus urban density in the Tri-State New York region, 1980 (Newman and Kenworthy, 1999)

The authors state that there is support for increasing densities in cities and to overcome many of the related problems of automobile dependence. According to Newman and Kenwothy (1999) this will best be achieved by using nodes along corridors, an approach the authors call "transit-oriented urban villages". These villages are supposed to create high-density nodes of mixed jobs, houses, and services linked to the rest of the city by good transit and by that increase the density. As a positive sign of sustainability, transit growth is happening all over the world, slowly in America but ever growing in Europe and Asia. This is an indicator that urban changes are occurring around the world, changes that hopefully slow down sprawl.

It can be stated from the data presented in the book that the less car dependent a city is the faster it is to recover after large transit projects. Newman and Kenwothy (1999), p.117 pinpoint that *"the transit cost recovery debate tends to focus on how to reduce government costs"*. In developed cities that can be done by influencing the form of the city towards a more transit-oriented structure. Cities around the world seem additionally to have about the same commitment of their resources to commuting. It appears to be related to the way commuting times adjust to about thirty minutes on average in all cities, independently of how they are provided with transportation infrastructure.

Newman and Kenworthy (1999) p.104-106 have been hard criticized by those that mean that economics, the marketplace, *"quite independent of planning intervention, will adjust cities"*. Those voices of criticism mean that car usage will level out and adapt according to e.g. supply of oil. Data has though not started to show that that this is happening as driven length per capita is still growing around the world and nothing indicates that the rule of the marketplace is having affect on the consumer.

Additionally many transportation planners, engineers, and economists have tried to draw attention to the close link between mobility and wealth. According to Newman and Kenworthy (1999), p.111 *"this leaves very few policy options open to cities for managing growth in car use"* but they also pinpoint that such data are often rather selective. The picture that the authors draw is that mobility is controversially not necessarily related to wealth as e.g. cities with high wealth (mostly European and wealthy Asian) are associated with lower mobility than those in the mid-wealthy range (U.S. and Australian). Though U.S. car usage (km/person) is the highest in the world it does not give

them higher per capita city wealth (called gross regional product, or GRP) than the much lower car use cities of Europe.

Without a doubt, road expenditure per capita in the world is in general high. By lowering these numbers and thus the car usage could mean lowering transportation costs in the future. The U.S. has the highest expenditure per capita and Asia the lowest but the extremes are not as apparent in these matters. Europe has relatively high road expenditure and that indicates the sprawl of the European cities these past decades.

Clearly traffic deaths decline with decreased car usage but there are more factors that influence deaths ratings due to traffic in cities. These are e.g. traffic regulations and usage of other motorized means, like motorcycles, education, management and traffic engineering.

It is common knowledge that both Carbon dioxide and smog emissions in cities are linked to health problems. Both indicators are highly linked to car usage and will not only be lowered by improved technology. As Newman and Kenworthy (1999), p.120 indicates by saying *"more fuel-efficient vehicles can just be used more, particularly if road conditions are improved to create freer-flowing traffic"*. Thus according to the authors an integrated transportation strategy is required that simultaneously improves technology, facilitates modal shifts, and reduces the need for travel.

Great costs are thus linked to automobile dependence as according to the authors findings the cities with the highest automobile dependence (Australian and U.S. cities) have the highest overall proportion of transportation costs (though traffic deaths and smog are not included). The cities in Europe and wealthy Asia, with their strong commitment to transit system are the ones with the least wealth going into transportation.

As these above facts show then to move cities towards sustainability in both economic and environmental terms would involve big changes to the way people think and act. According to transportation possibilities it is evident that automobile dependency is damaging in economic, ecologic and social aspects. The consumer is firstly in need of getting sober to be able to think straight and then their dependency on the car has to end. It seems that good rail system return great benefits for larger cities but cities that implement plans for improving the contribution of nonmotorized transportation are likely to see immediate and long-term benefits. Sustainability is a long term commitment and only done through united global effort. Though the European and wealthy Asian cities appear to have transportation systems that are both the least costly and the least environmentally damaging they cannot just sit back and relax. Almost all cities have growing car usage and thus everyone have to do better in terms of car use.

In the following Newman and Kenwothy (1999) future vision to reduce automobile dependence will be presented.

2.5.2.3 The future vision

To change a large body like cities is a hard and time consuming process and will not be done over night. Changes can bring about alternation of large systems as the car. Large systems that constantly are in front of us are so grown into the mind that nobody believes that their function and appearance can ever change. The complication factor is large when it comes to changing cities and thus many tend to just say or think *"that their city is the way it is"*. (Newman and Kenworthy, 1999, p.128)

Not many share the belief that a city can be changed and thus misbelieves are held about automobile dependency as can been seen in following:

- "As soon as people get enough money they will buy a car and move to the suburbs" that's inevitable. No, if the right technological improvement is in place and the freeway system are operating close to capacity and cultural changes are imminent the whole system can alter in a matter of short time, it has nothing to do with wealth.
- Automobile dependency is due to lifestyle induced by the climate or countries amount of open space or even its age . No, if low-density planning and high car use are encouraged in a city it has in most cases nothing to do with climate, space at hand or age there are some deeper reasons behind it.

The main approaches used today to reduce automobile dependency are technological improvements, economic instruments, and planning mechanisms. **Technological improvements** are one of the main tools to improve our environment. This they do in form of more efficient cars so each car can drive longer per liter and less pollution comes from its usage. The main problem with this is that it sometimes tends to create a bigger problem as people e.g. tend to drive more when it is more economically efficient to drive and thus in the end these technological improvements end up changing nothing. **Economic instruments** are hard to use as "brave politicians are hard to find". Economic instruments are used e.g. to reduce the usage by pricing vehicle usage or end subsidize policies for cars. But *"sustainability cannot wait for politicians"* (Newman and Kenworthy, 1999, p.142) and thus there are great hopes for planning mechanisms to be the salvation for modern cities. **Planning mechanisms** are to reduce the need for cars and strive towards more sustainability and that involves practitioners, academics and planners to take the control and guide people and cities. According to Newman and Kenworthy (1999) this involves that the "planning professionals must earn new respect by showing that they can understand not only how cities work but how to create new market-oriented solutions, how to involve people in the new agenda, and how to implement policies that truly lead to sustainability".

But if this were the approaches to use what are the techniques to use to overcome automobile dependency. According to Newman and Kenworthy (1999) the techniques to use to overcome automobile dependence are mainly five:

1. Traffic calming – to slow auto traffic and create more urban, humane environments better suited to other transportation modes.
2. Quality transit, bicycle, and walking – to provide genuine alternatives to the car.
3. Urban villages – to create multimodal centers with mixed, dense land use that reduce the need to travel and that are linked to good transit.
4. Growth management – to prevent urban sprawl and redirect development into urban villages.
5. Taxing transportation better – to cover external costs and to use the revenues to help build a sustainable city based on the previous policies.

By using these approaches and techniques on Auto City a more Sustainable City can be re-developed where automobile dependency is decreased. According to Newman and Kenworthy (1999) this can be done in the four following steps:

Step 1: Only by revitalizing the inner city a more sustainable city is gained. The core of the city is thus to be tackled first and the revitalization is closely associated with community processes as no strong market forces pushes the process. Traffic calming in the city center is vital and as it is a politically sensitive matter, it will be a hard battle. If successful people will start to take notice of

the place, invest in houses and suddenly a revitalized center is gained. When accomplished, subcenters can be started to get linkage to the inner city central in form of good transit.

Step 2: A transit system between inner city and subcenter is vital and preferably is should be a rail system. If a rail system is already in place, bike-and-ride facilities should be added to the stations and bus timetables should be integrated with the rail service. A joint development between public and private interests is the best way to optimize the use and management of land around the stations. According to Newman and Kenworthy (1999), p.187 urban villages can be made, and they shall preferably be in the style of the theories of New Urbanism, i.e. by the use of design and transit oriented development (TOD).

Step 3: Now discouraging of sprawl has to take place. Therefore investments in highways and zoning ordinance have to be changed. According to the authors, both steps are necessary. Next in line is then to set strategic goals for the villages and their urban fringes so people know what they are "getting into".

Step 4: This step includes further development of the whole network, to extend the transit system into poorly served suburbs, including cross-suburban and orbital rail lines, and to build new urban villages around them. This will eliminate the need for a car and the whole city will become less car dependent and thus more sustainable than before.

These four steps show how the Auto City could change over time and become more sustainable. Though rather rough ideas the main point is that by bringing together the processes of reorganization, traffic calming, state-of-the-art transit and bicycle planning, the New Urbanism design of streets for pedestrians, growth management, economic penalties on private transportation, and transit oriented development planning in new and old suburbs, and urban villages, sustainable solutions will be the outcome.

Overcoming automobile dependence in cities does not automatically give cities a sustainability "stamp". More is needed to be done and more measurements to be taken. These include e.g. water supply, storm water and sewage system, the material inputs and solid waste management system, and the greening issues of urban parks and urban agriculture as well as all the cultural and social aspects that inject cities with more livability. Additionally the interplay between the market-, government-, and civil society of cities have to be looked at as only by having these three working together will sustainability truly be facilitated.

I will close this book review or sample of findings by the word of the authors that in my opinion frames what hopefully will be the outcome of the modern circumstances:

> *"If in the future "Sustainable" City we can genuinely recognize community values, maximize diversity, establish new boundaries and move flexibly between them, incorporate a range of new disciplines, and facilitate organic processes, then we will probably recognize that the old Auto City model with its simple, modernist goals and regulations was not only inadequate, it wasn't nearly as interesting".* (Newman and Kenworthy, 1999, p 305)

2.6 Section conclusion

It is apparent that the urban planning history is highly intertwined and that no new groundbreaking theories have emerged the last 70 years. We are still living in the urban development wake of World War II and perhaps now we are trying to work our way out of the dark ages of urban

planning. As said before, the urban planning, as the practice we know today, has only existed for around 200 years and is still finding its way in constantly changing societies. (Hodge & Robinson, 2002)

The humankind is egoistic and corrupts nature while also being capable of showing courage and passion for the fellow travelers. It is this double faced nature of the humankind that is in a great battle in more modern times as many show the will to follow the path of sustainability while others choose to close their eyes to the obvious harmful urban development and stay on the path of sprawl, nimbyism and ecologically harmful means of transportation. It is evident that the communities of the world are growing in size parallel with their pollution effect and thus the need for the urban design is apparent. Communities come in packages though and thus there is not a great room for individualistic approaches like "accepting the needs but not reacting themselves".

> *"Unfortunately, communities come in packages. They cannot be ordered up á la carte. Community design consists of complex tradeoffs, with a limited number of win-win solutions. For the most part it is slow, arduous, iterative, pluralist, and contested, punctuated by creative breakthroughs from time to time. It is not exact work. Community design is an approximation, community development a compromise. But that is not to say that it is casual or provisional. Once adopted - however imperfect - comprehensive plans, neighborhood plans, and design guidelines need to be implemented with consistency and conviction."* (Kelbaugh, 2002, p.357)

As a member of a community or a modern society one has the obligation to participate as well as the right of being heard when it comes to urban development matters. This right has never been more important as now but despite that a certain obligation has to be passed to the professionals. Professionals, being planners and scholars, then have the obligation of getting along and working with political forces and policies and politicians that also have to be strong enough of not to break under the pressure from (local) developers and large interferinge forces of the community.

According to Grant (2009) this pressure can have substantial affects on the way land is used in communities. The outcome follows, in most cases, a complex interplay of provincial policy, municipality politics and regulations and market preferences and has in many cases nothing to do with the values that planning theories holds. The link between politicians (council members) and developers can be significant and can undermine and influence the work of planners. Planning can thus easily become a highly political profession. In a perfect world a developer should concentrate on building good places, politicians should be thinking long term about what is good for the community and planners should obey and consult the policies and work in the favor of the residents. But a plan is one thing and reality is another and the reality is that market constraints and private-sector solutions may affect development practice. (Grant, 2009) This is what has been called "the dark side of planning" and according to its main chronicler Flyvbjerg (2002, p.62) *"Planning is inescapably about conflict: exploring conflicts in planning, and learning to work effectively with conflict can be the basis for a strong planning paradigm"*.

If a new gospel in urban development has been discovered in New Urbanism or a combination of the theories of Compact City (Smart Growth) and New Urbanism, only the time will tell. Most likely these theories will keep on growing and developing (and maybe merge), into something that then once again will be called "neo" or new. The urban planning landscape, as it is today, shows that the theory of New Urbanism is highly competitive for obtaining more sustainability on a regional level but not a flawless one. It is evident that the "market moralities" will give increased challenges to urban planners in the future and maybe that is exactly the driving force needed for

urban practitioners in their quest of making our living conditions more pleasant, likable, problem free and above all more sustainable.

For Reykjavik the above all holds true. The planning practice has been influenced by planning pioneers of the past, been effected by many planning concepts, raged through the post War era with speed and lack of regard for the human being, only to come out on the other side as a confused and dizzy practice. Sustainability has been the buzzword and Reykjavik has grabbed that firmly to keep balance. New theories have emerged in the wake, which market themselves as salvation for modern societies in a world that is highly car oriented.

In the following chapter Empirical Section there will thus be looked at how and in what way the planning practice of Reykjavik has developed the urban areas of the municipality in the past to present day. This will be done to cast a light on and compare the underlying forces so a discussion and then conclusion can be made to this study. One neighborhood, Artunshofdi cape, above all is reckoned to have a key role in the coming urban development of the municipality. This area will thus be looked at closely and its role will be analyzed.

3 EMPIRICAL SECTION

In the following the urban development of Reykjavik will be analyzed. The aim is to get as much knowledge as possible, knowledge that in the end will service the cause of this report, i.e. to discuss how sustainable Reykjavik has grown and if Artunshofdi cape could in the future serve as an inspiration example for the inhabitants of Reykjavik to choose the more sustainable ways of living.

Icelanders way of living is and will always be in a close relationship with the nature. To Icelanders the Icelandic nature is as precious as it is merciless. It gives cheap energy to the wheels of the economic life and a rich energy to the souls of the inhabitants as well as visitors. Visitors give great income to the national capital and their travelling gives vital income to the municipalities. Most visitors come to experience this close relationship and the image that Iceland has first hand. This image is vital to treasure and nurture in a society of little less than 319.000 souls.

Reykjavik as a capital has a great responsibility of nurturing this image as well as transmitting it to the global environment. The government and those who work on urban development's matters have a vital role to play in this image making or image transformation. This has as well the general public and if those actors find a common ground and maintain a high level of cooperation then the outcome or the image can be magnificent and certainly become more sustainable.

The image that Reykjavik transmits to the global environment is thus the subject of this chapter i.e. how is Reykjavik's image in the 21st century, less than 70 years after it formally became an independent republic and what is being done to maintain or transform this image? As an image does not exist without a saga, this chapter will also include a deliberation on the chief points of Reykjavik's history or urban development.

The area of Artunshofdi cape is indisputably intertwined into this history and its now central location in the Reykjavik municipality makes the area a food for thought. To gain a clearer picture of what potentials the Artunshofdi cape has to offer to the future urban development of Reykjavik there will be, at the end of the chapter given an overview over the area of Artunshofdi cape.

3.1 Iceland

Iceland is a volcanic Island in the North Atlantic Ocean that has been shaping throughout the centuries. The island lies east of Greenland on the Mid-Atlantic-Ridge where the boundaries of the North American and the Eurasian continental plates are. The two tectonic plates are moving in east and westward direction, approximately 1 centimeter per year i.e. only during the last century the plates drifted 2 meters away from each other. The geographical location of Iceland and this continental drift that started for about 60 million years ago has shaped the island and made it to what it is known for today, i.e. the island of great contrasts where cold climate meets geothermal activity, volcanic eruptions and earthquakes. The islands geographical as well as geological circumstances, harsh climate and rough but spectacular nature has throughout its history of settlements both allured as well as repelled visitors and settlers. (Valsson, 2003)

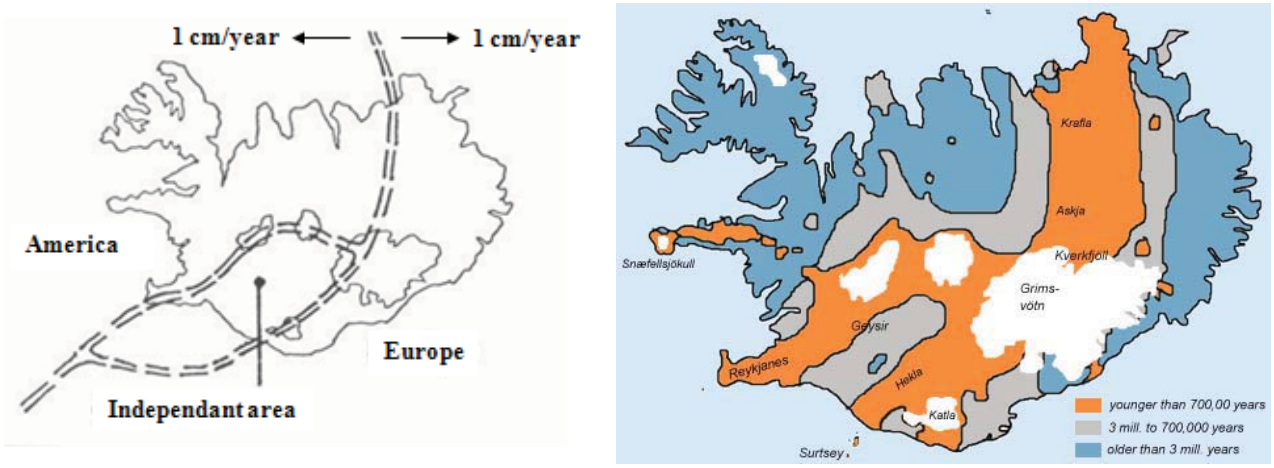


Figure 3-1: To the left, the geographical circumstances in Iceland (Valsson, 2003), to the right, geological age of the island, the East Fjords are approx 15 million years old(Geology of Iceland, n.d.)

3.1.1 The Icelandic settlements

The Icelandic historical heritage tells that the first settlements on the Icelandic shores began in the year 874 AD. That year a Norwegian chieftain, Ingólfur Arnarson, became the first man to become a permanent settler. The history claims that when Iceland was in sight, Ingólfur, threw his two high seat pillars overboard with the word of promise, to settle where the two pillars would drift ashore. The Vikings believed that it was an act of good luck to do so, i.e. the idea was to put the faith in the hands of the Gods to decide their destiny. The two pillars drifted to a small bay that got the name Reykjavik. (Landnámabók (Sturlubók), n.d.)

The Icelandic Age of Settlements (Landnámsöld) is considered to have lasted from 874 to 930 AD but not all latter settlements where so incidentally formed as the first one. The early time settlers lived off what the land could provide and thus the location of farm sites were chosen where conditions for livestock and fishing seemed to be good as well as good accessibility to fresh water. Those settlers were unaware of the hazards that the island and its nature had to offer and thus many of the first settlements where highly experimental ones. The history tells that many of the early settlements where gradually moved or pulled back as the nature showed its true strength. Occasionally volcanoes erupted, coastal- and river areas were flooded and fjords were packed with ice. The early settlers did not have this knowledge and neither the familiarity to the large temperature and climate difference between different parts of the island. The early settlements where thus hard on the settlers and the later times knowledge has shown that the first settler, Ingólfur Arnarson, could not have chosen a better place in Iceland to settle down. Reykjavik has a mild climate that does not vary as much as in the rest of the island, there is abundance of geothermal energy and fresh water, the inland is flat and is good for grassing animals and the closeness to the sea and good harbor possibilities savor the location with great quality. If it was the Gods will or a pure luck will never be proven but Reykjavik's location has proven, ever since the first settlements, to be an excellent choice of location for its settlers. (Valsson, 2003)

3.1.2 Population

The first settlers were from Norway and as such they had some experience with cold climate and spectacular nature. Their perseverance was great and that marked the foundation for today's Icelandic nation that in the end of 2010 marked about 319.000 inhabitants. Gradually the settlers gained knowledge of the harsh environment and that can be shown in how this population is spread across the island.

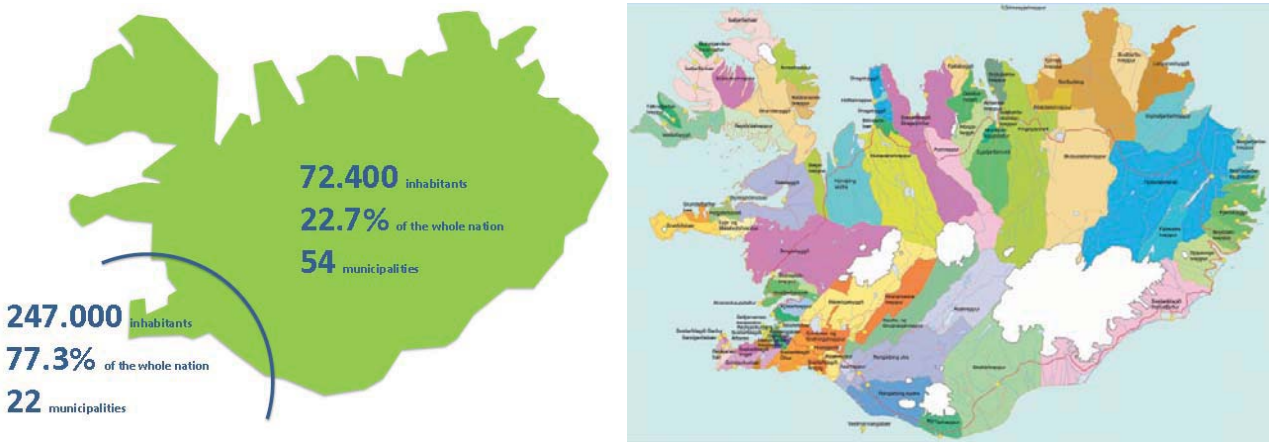


Figure 3-2: Iceland in 2010, to the right Iceland's 76 municipalities and their major towns [(Sigurðsson H. , Interview, 2011) and (sveitarstjórnir á Íslandi, n.d.)]

The island is divided into 76 municipalities that are all different in size and shape. Almost all municipalities have their own major town or more densely populated areas. Those, as can been seen in Figure 3-2, are still today highly related to the coastal areas where the closeness to the fishing grounds are. In end of 2010 there were 98 towns in Iceland that had population above 50 inhabitants or more. In these there lived approximate 95% of the nation or about 302.000 inhabitants. Most of the population or about 77%, live in the south-west corner of the island where the first settlers came to shore. (Mannfjöldaþróun, 2010) This development has resulted in that the island that has a magnitude of approx. 103.000 km^2 there are approx. 64.500 km^2 of wasteland, i.e. only about 37% of the island is inhabited. (Geographical data, n.d.)

3.1.3 The governance

Iceland's form of government is republic. As such the head of government is not a monarch and the offices of the government are elected by the people. The head of government, the president, is more of a symbol as its influence is rather weak. The government is divided into three branches (trias politica principle), i.e. executive, legislature and judiciary. The Icelandic State is the holder of executive power (the president hands over its power to the prime minister) and Althingi is the holder of the legislature.

This is the umbrella of governance in Iceland. Under this umbrella there is then in each municipality to be found Municipality Government. Those Municipalities Governments are to follow the regulation from the Icelandic State and it is the responsibility of the capital governance of Reykjavik, the City Government, to see to that those regulations are followed through in each municipality. The municipalities serve thus as administration units, a unit that stands nearest to the general public. Every fourth year the general public of each municipality votes for which Party shall lead the municipality the next 4 years.

As an administration unit, the Icelandic municipalities main tasks, are to provide for its residents service and education. The main tasks are thus running and managing kindergartens, elementary- and music schools as well as providing its inhabitants with garbage management, public transportations, social service and service to elderly and handicapped. (sveitarstjórnir á Íslandi, n.d.)

3.1.4 The capital Reykjavik

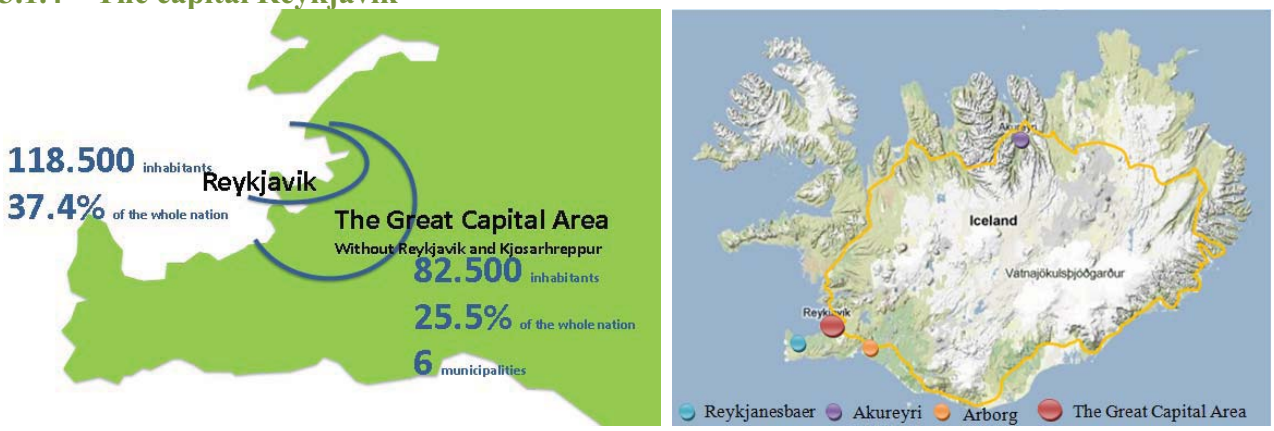
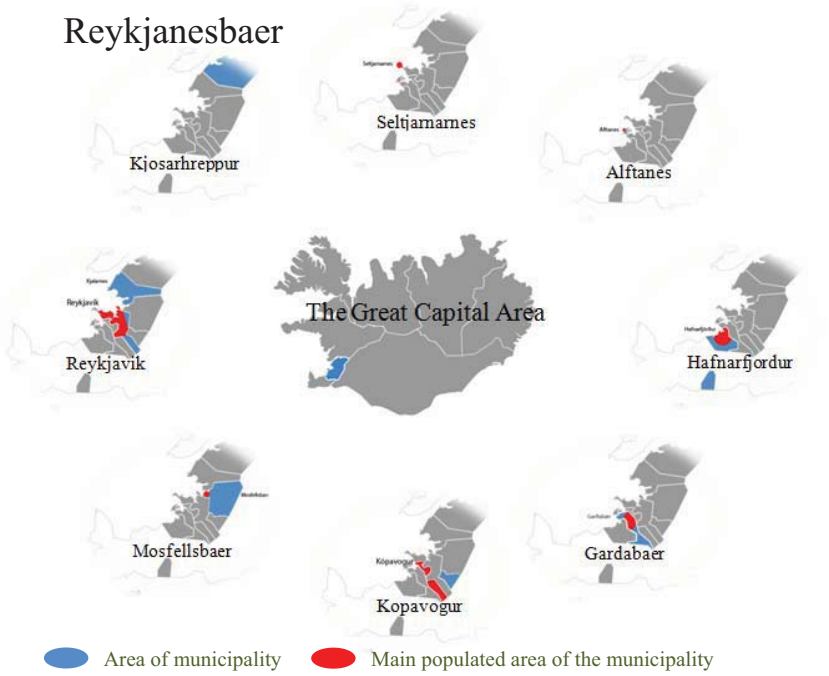


Figure 3-3: Statics and location of Reykjavik and the Great Capital Area [T.L. (Sigurðsson H. , Interview, 2011) and(Google Maps, 2012)]

Reykjavik is the capital city of Iceland, as has been indicated. Reykjavik's municipality is located at a peninsula in the south-west corner of Iceland. There the municipality lays in a close relationship with 7 other municipalities i.e. municipality of Koparvogur, Gardabaer, Hafnarfjordur, Mosfellsbaer, Seltjarnarnes, Alftanes and Kjosarhreppur. Today these form what is now called the Great Capital Area or the Capital region (see paragraph 3.2.3.1). Reykjavik municipality can be categorized as being one among the smaller municipalities in the country but despite of that it is the most heavily populated of them all, with population of approx. 118.000 inhabitants or over 37% of the whole nation.

Figure 3-4: Reykjavik's location in the Great Capital Area [T.L.(Sveitarfélög, n.d.) and T.R. (Já, 2012)]

There is one road that combines all the major towns and municipalities of Iceland, i.e. Hringvegur 1 or Highway 1 as can been seen in Figure 3-3. The most populated municipalities besides those of the Great capital Area are Akureyri, Reykjanesbaer and Arborg. Akureyri is the only one that is not located at the south-west corner of the island. Because of this distinctive feature, i.e. its northern location and relative high population it is sometimes called the capital of the north shore.



Population of major towns 1 January 2011	
Name:	**Population:**
Reykjavik	118.898
Kopavogur	30.779
Seltjarnarnes	4.320
Garðabaer	10.909
Hafnarfjordur	26.099
Alftanes	2.484
Mosfellsbaer	8.642
Kjosarhreppur	210
Reykjanesbaer	13.971
Akureyri	17.754
Arborg	7.827

Figure 3-5: The 8 municipalities of the Great Capital Area (T.L.) (Sveitarfélög, n.d.) and static for the most populated municipalities (T.R.) (see Appendix 2: Iceland in Numbers)

As can been seen here above Reykjavik today forms a union with 7 others municipalities in the Great Capital Area. This was though not always the case as the urban development of Reykjavik has shown. In the following this remarkable history will be told.

3.2 Reykjavik's urban development

In general the primary cause for the development of urban areas and their transformation into urban cores is the need for people to gather in a place to conduct activities that concerns the society as a whole. In Iceland the town formation was in a high degree related to fishing, agriculture and later also on free trade. Bad climate conditions, diseases, loss of autonomy and world conditions, have as well set its marks on Icelandic urban development. It was mainly one urban core that was able to withstand and endure those historical trials in a good manner, and that was Reykjavik. Reykjavik's good natural harbor for the growing size of the fishing boats and its sea links with foreign countries and important hubs in Iceland was one of the reasons of the town success. Its lowland provided as well important agricultural and cultivation areas for the inhabitants but maybe the largest factor of the town success was simply intertwined into its fate or destiny to becom the main urban core of Iceland. (Valsson, 2003)

3.2.1 Reykjavik's urban development till 1965

The urban development of Reykjavik was definitely not effortless and easy at all times. Denmark ruled over Iceland from 1814 to 1944. Reykjavik's development from town, into a capital area was thus influenced by the Danish king and its government as well as Icelandic freedom fighters, students and scholars who many were living in Copenhagen (called the Fjölnir Group). The main idea behind this urbanization of Reykjavik was, to create a stronger and more modern type of government in Iceland. Instead of having Iceland ruled from Denmark, Reykjavik was to become headquarter for various social institutions as well as centre for administration. To fulfill this vision

some institutions located in the country or in the vicinity of Reykjavik had to be relocated in the capital. (Valsson, 2003)

The most important steps in making Reykjavik a centre or capital town where taken in 1844 – 1845. Then the Althing, the national parliament that had been discontinued for 45 years, was re-established in Reykjavik as well as the Latin School got his place there. The next 30 years Iceland got home rule, a new constitution (1874) and the Althing became a legislative body. Ordinary citizens and many officials e.g. the governor, the bishop, the bailiff, the chief judges, and the national doctor and pharmacist moved or were moved to Reykjavik together with their activities. These first stages of the urban development of Reykjavik were a forceful act seen from the planning profession point a view. This development started, in the late 17th century and proceeded to the late 18th century, and marked an era of a migration from the land to city that still exists today. (Valsson, 2003)

In the late 18th century and up until the turn of the century, Reykjavik's role in export and import increased. Now the importance of improving the transportation network in the city as well as to connect it to its neighboring regions became vital. This was the first step of building up planned transportation facilities in Reykjavik, a process that took many decades. (Valsson, 2003)

Figure 3-6: Horse pack trains going over a bridge in Reykjavik (T.L.) (Valsson, 2003), Horse wagons (Center) (Valsson, 2003), rivers were great hurdles (T.R.) (Valsson, 2003)

The first real regulation regarding transportation was a new transportation directive in 1861. The first legislation regarding roads came though first in 1894. This legislation included that the Icelandic road system should be divided into transportation routes, national routes and mountain routes and that proper roads should be built in the most populous towns as well their uplands. The years before this legislation there were primary horse pack trains and people on foot that relied on the country road/track system. Now The Age of Horse Wagons had started and it demanded better road conditions. This era in Iceland was a short one but it marked a necessary step in the development of Reykjavik's road system. Now the need for roads that could reach some distances into the countryside rose. The demand for getting the same distance on land that earlier was by boat got stronger and this era marked the foundation of the main transportation routes of Reykjavik that still today are similar if not the same. Like roots of a tree the transportation system of Reykjavik slowly expanded and the main roads were the ones up to Hellisheidi heath and into Hvalfjordur fjord and to the south to the Reykjanes peninsula (see Figure 3-7). (Valsson, 2003)

Figure 3-7: The first planned transportation roots in Reykjavik (Google Maps, 2012)

The greatest barriers inside and in the uplands of Reykjavik were large rivers and creeks. The first bridges that were built in the Age of Horse Wagons in Reykjavik were built in 1895 (over Fossvogur and Kopavogur streams) and the last ones where built in 1891(over Olfusa river) and 1895 (over Thjorsa river). The later ones were quite accomplishment and by that time some of the road system had reached about 90 km from the center of Reykjavik (see Figure 3-7). (Valsson, 2003)

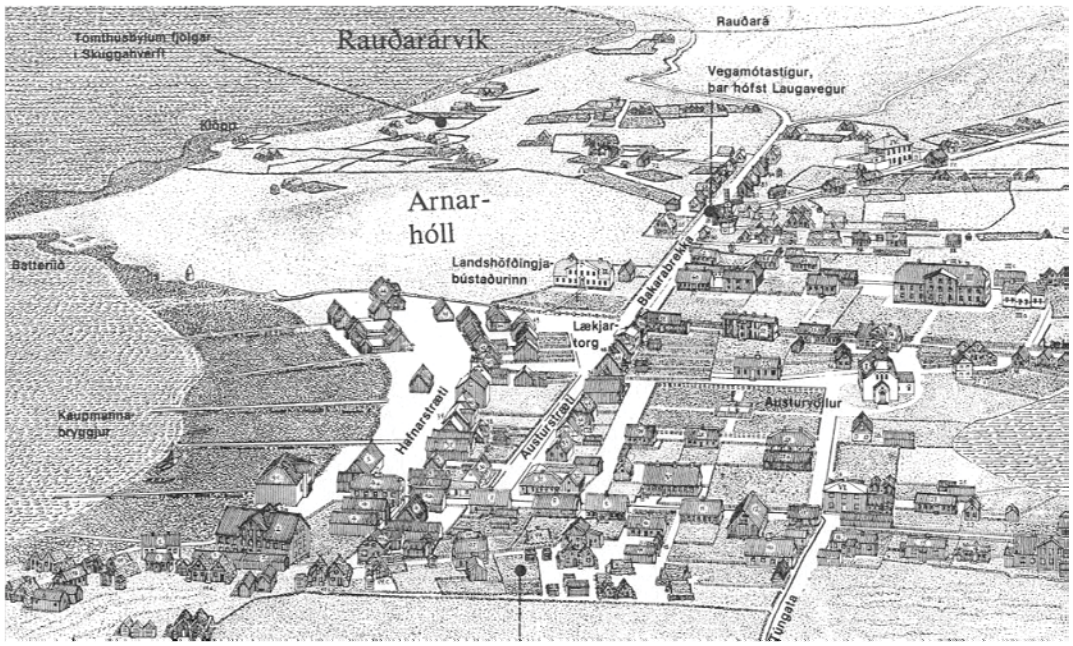


Figure 3-8: Image of Reykjavik in the early days of its development (Valsson, 2003)

In the late 18th century, Reykjavik could have had an appearance as can been seen in Figure 3-8. The city was in some way highly sustainable or its citizens were very self-sufficient. The structure was a mix of a town, a fishing village and country, where people used their backyards to grow vegetable grazing animals or drying fish. The street pattern was small and narrow and there was no sewage drains. The streets were vibrant as peoples work in general was carried out outdoors and

people got their water at specific water stations and washing of clothes happened mainly at one place. Reykjavik was growing in size and shape and flourishing in many ways. Despite of this it could also be stated that the town was, in some ways, going through degradation phase as the standard of cleanliness was getting worse and worse. A modernization process were thus launched were streets were paved with asphalt and water supply system and gas distribution and telephone lines were mounted. Foundation for cultural and recreational activities started and a proper harbor was built.

In 1904 the first car came to Iceland but it could be said that the Age of the Car started for real in 1913. Along with this, the need for building areas in Reykjavik grew, as from 1900 – 1915 its number of inhabitants more than doubled, i.e. from about 5.800 to 14.200 (see Table 3-1) . Only then the need for foresight, when it came to urban development of Reykjavik was recognized as the street patterns were too narrow for these new ways of transportation. This latter year's rapid development lead to, in 1902, that the town hired its first city engineer. (Valsson, 2003)

Figure 3-9: A car in trouble in Reykjavik (first) (Valsson, 2003), Car at the new harbor (second) (Valsson, 2003), the first buses (third) (Valsson, 2003), Long-distance bus (fourth) (maggih, 2009)

3.2.1.1 Planning became a practice

In 1915 there was a large fire in Reykjavik that resulted in twelve wooden houses burning down. This triggered a heated debate about the urban planning of the city and more focus came on planning as a profession. The lack of food, an epidemic of Spanish Influenza and a period of extreme cold during the years of World War I (1914 – 1918) resulted though in quieting of those voices. The main influence that the years of the World War I had on the urban development of Reykjavik was an increase in importation of milk, agricultural produce and goods to Reykjavik from its uplands. This decreased the cultivation and farming within the town limits and strengthened the already mentioned main transportation routes into the city (see Figure 3-7). The fire brought a ban for wooden houses in the center of Reykjavik and the Concrete Age started. The end of World War I left Reykjavik with extensive migration of people to the city, high prices of goods and expensive building areas. In addition, in 1918 an agreement with Denmark was made that Iceland should become recognized as a fully sovereign state of Denmark. This agreement meant that more responsibility was put on the Icelandic citizens concerning the city's urban development. (Valsson, 2003)

Prosperity and enthusiasm characterized the upcoming times in Reykjavik. Car ownership had grown these first two decades of the 20th century and was in 1920, 130 in total. As the majority of the inhabitants did not have cars and distances were ever growing, a simple bus system had started to develop. At first this system consisted of passenger cars between important places within the town like the swimming pool in Laugardalur valley. At the same time, around 1920, the asphalting of the downtown street was finished and year later the first planning law was published i.e.in 1921.

A committee was established in 1924 to make the first master plan for Reykjavik, a master plan that was published in 1927 (see Figure 3-10). This master plan was a plan for the main populated area, an area that was to be embraced with railway running around the town. This railway idea was never accomplished. (Valsson, 2003)

The moral of the 1927 master plan was to build high continuous rows of buildings along narrow streets in quarters with few open spaces. The wooden houses of the center should be replaced with more modern concrete constructions. There should be almost no parking spaces and no main roads cutting through the city. At this time there existed about 200 cars in Reykjavik and the number was growing. Along with this development the variations in car types increased and the transportation options were improved. By now it was possible to travel with long-distance buses to the countryside but a breakthrough came about in 1931 when a "real" bus service was established inside the city boarders. The Reykjavik Bus Company was founded in 1931 and operated six buses on few routes. Now transportation from suburbs to the town could be realized in a decent time by buses and this marked an era of increased dependence on motor vehicles. This motor vehicle improvements and increased car ownership, which ever since both in Iceland and other countries has challenged the planning practice was one of the factors that marked the end of the master plan of 1927. (Valsson, 2003)

A new master plan for Reykjavik was introduced in 1937 (see Figure 3-10). This plan covered a larger area then the plan from 1927 and introduces two types of road systems, i.e. through fares and residential streets. The master plan from 1937 was an innovated one but it was set to an end with the arrival of the British army in 1940 and the American army a year later, i.e. under the World War II (1939 – 1945). The occupying force brought huge influx of capital and jobs for the inhabitants of Reykjavik. In a matter of short period Reykjavik was overflowed with new machinery, equipment, cars and other vehicles as well about 7000 soldiers infiltrated the town and the town got its own airport. Along the occupying period a huge knowledge were brought to the small town as well as awareness in the field of planning. This economical and knowledge based boom of the World War II resulted, in 1944 that the Icelandic nation determined to end its union with Denmark and establish a republic. That meant that from that year on all the decision concerning the country welfare and development was entirely in the hands of the Icelandic nation. Despite of this epoch-making decision the migration from the country increased and that resulted in a new plan for the Reykjavik area, that is the master plan of 1948 (see Figure 3-10). This plan covered larger area than prior plans, i.e. it covered the whole peninsula that Reykjavik is located at.

> *"This plan embraced all the latest fashions trend in planning, both in Europe and America, fashion trends that later turned out to be very flawed and are now seen as having caused much damage in urban development"* (Valsson, 2003, p.134-136)

The plan proposed that the whole north coast of the peninsula would be for industry only and that most of the old buildings of the center would be demolished in turn off more modern houses. The division between industry, residential, institutions and city centre was clear and the road system now got three categories, i.e. through fares, primary roads and residential streets. The guidance of the 1948 plan was almost never abided by but it symbolizes the growth and fertility of the planning practice in Reykjavik at that time. (Valsson, 2003)

The eastern part of the peninsula that Reykjavik is located on started to play a huge role after 1940. During the World War II there was a great need for agricultural products in Reykjavik that was fulfilled with the existence of little villages or suburbs some distance from town. These villages served as well the demand for an intermediate step to urbanity for the migration from the country.

As said, the car ownership in Reykjavik grew and the variation in motor vehicles in same manner after the World War II. This all gave uplift to sprawling of the city settlements and maid a life, in some distance from the city center possible. In 1944 the City of Reykjavik bought the Reykjavik Bus Company and took over the running of the city buses. In 1950 there existed 3000 cars in Reykjavik and the inhabitants were little below 60.000. (see Appendix 2: Iceland in numbers and Appendix 3: Transportation numbers)

The next almost 10 years or up to 1957, Reykjavik's growth was more than ever and the Master Plan of 1957 was realized (see Figure 3-10). At this time a planning theory, called Satellite Planning (see paragraph 2.2.2), caught the interest of the planners of Reykjavik. This theory was widely used in Europe at the time, for large new towns or suburbs that was developing in the outskirts of the European municipalities. The main content of the theory was how to make these neighborhoods in the suburbs more manageable. At that time it was estimated that the best way for those neighborhoods to prosper was to try to isolate them from each other and make them highly self sufficient units. This theory of self sufficiency defied the planning of the 1948 plan, where the whole city was divided into larger zones of e.g. industry-, residential- and recreational purpose. Because of this new ways of thinking, in urban planning procedure, the Master Plan of 1957 was made. This plan grasped the ideology of the Satellite Planning though it shared the vision from 1948 concerning the will or need of expanding the city limits. The Master Plan of 1957 shared also the vision of making the north coast of the peninsula to an industrial area and for the first time the Artunshofdi cape area (see paragraph 0) was included into the planning. In this plan the Artunshofdi cape area (seen to the far right in the map in Figure 3-10) is to become both residential area as well as industry and employment area.

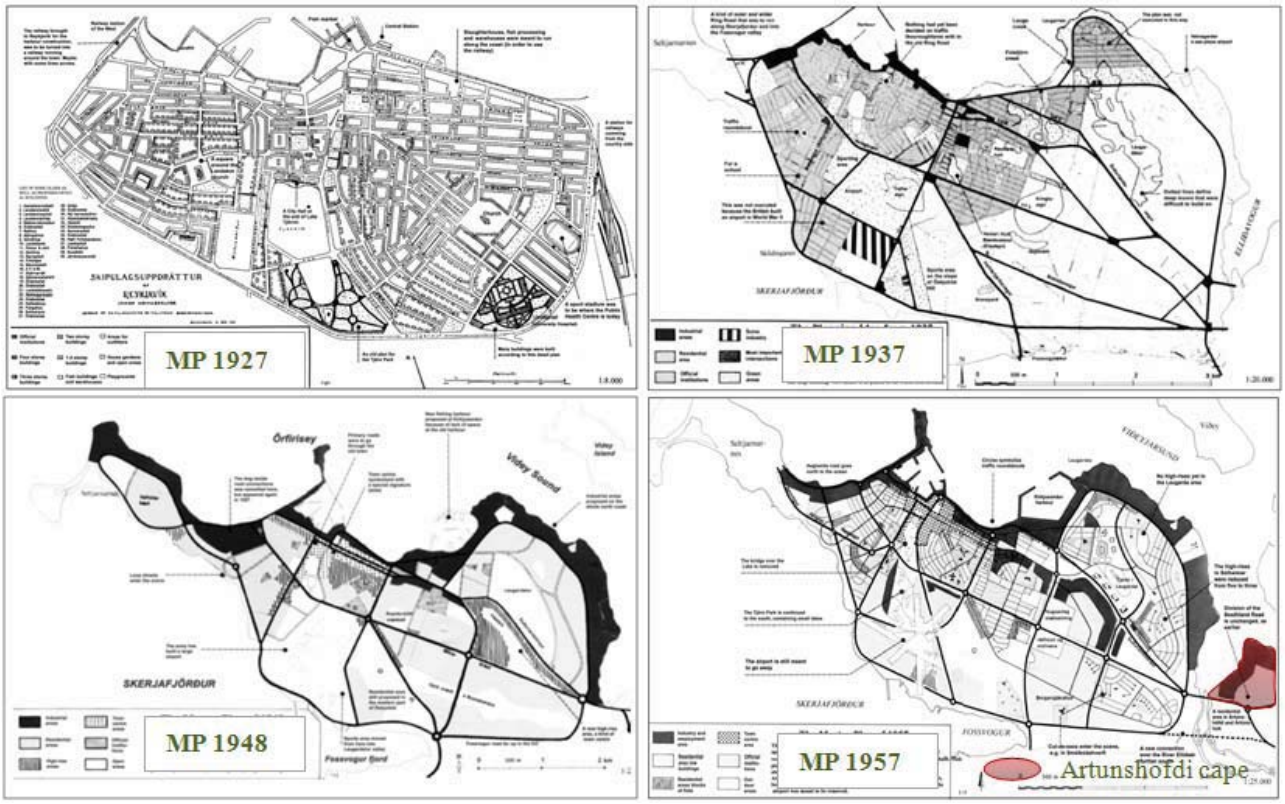


Figure 3-10: The first Master plans of Reykjavik (Valsson, 2003)

3.2.1.2 The actual transformation till 1965

Figure 3-11: Vibrant street life in 1910-1913 in Hafnarstraeti street in the City Centre (Fjölskrúðugar heimildir sagnfræðinga, n.d.)

Now there has passed 30 years of planning as a practice in Reykjavik and the urban development has been colored by the trends and policies of all of the years. It is hard to keep on describing the continual urban development of Reykjavik without getting a clearer picture of the real situation of Reykjavik during this period.

Population development and car ownership in Reykjavik from 1801-1965							
Year	Population of Reykjavik	Percentage of the Icelandic nation	Private car ownership	Year	Population of Reykjavik	Percentage of the Icelandic nation	Private car ownership
1801	600	X	0	1920	17450	18,5	130
1860	1450	X	0	1925	22022	22,0	X
1870	2024	X	0	1930	28052	25,8	210
1880	2567	X	0	1935	34231	29,5	X
1890	3706	5,2	0	1940	38308	31,5	X
1895	4222	5,7	0	1945	46578	35,7	X
1900	5802	7,4	0	1950	55980	38,8	3000
1905	8997	11,1	~1	1955	63856	40,0	5500
1910	11449	13,4	X	1960	72407	40,8	7500
1915	14160	15,9	X	1965	78399	40,5	12700

Table 3-1: Population and car development of Reykjavik in 1801-1965 (see Appendix 2: Iceland in Numbers)

In the year 1876 the population of Reykjavik is said to be close to 2,500 persons and the shape of the town as to the left in Figure 3-12 or as can be seen in Figure 3-8. As said, Reykjavik is a vibrant town with wooden houses and still its original shape of the harbor site. The next 40 years or up to 1916 the situation has changed a lot as Figure 3-12, to the right, shows. Now the urban sprawl of the city was started and the inhabitants number had increased by about 600%, up to about 17,000 (see Table 3-1). Most of the houses were still made of wood and the Age of the Horse Wagons is coming to an end. A seawall has been added to the harbor and the start of the age of both Concrete and Cars is imminent. The town image and atmosphere at this time can be reflected in Figure 3-11.

Figure 3-12: Map of Reykjavik in 1876 (T.L) (Europe Reflected in Archives, n.d.) and in 1915-1918 (T.R) (Söguleg kort, 2011)

The town kept on changing and taking a form and in 1942 it had the appearance as in the map in Figure 3-13. The World War II increased the town image, and more people moved to Reykjavik from the country side. At the end of the War the area that were embraced of the first master plan of Reykjavik i.e. Master plan 1927 was fully built and the inhabitants of Reykjavik were about 46,000 and increasing. The next twenty years or so, up to 1960 the urban sprawl of the city was immense. As a result from the Satellite Planning theory (see paragraph 2.2.2 Satellite planning), new settlements started to grow far from the City Centre (see orange in Figure 3-13). In addition, the south side of the peninsula got an airport and a large cemetery. These marked, and guided the earlier urban development of the city and hindered residential areas to develop to the south side of the peninsula. (Valsson, 2003)

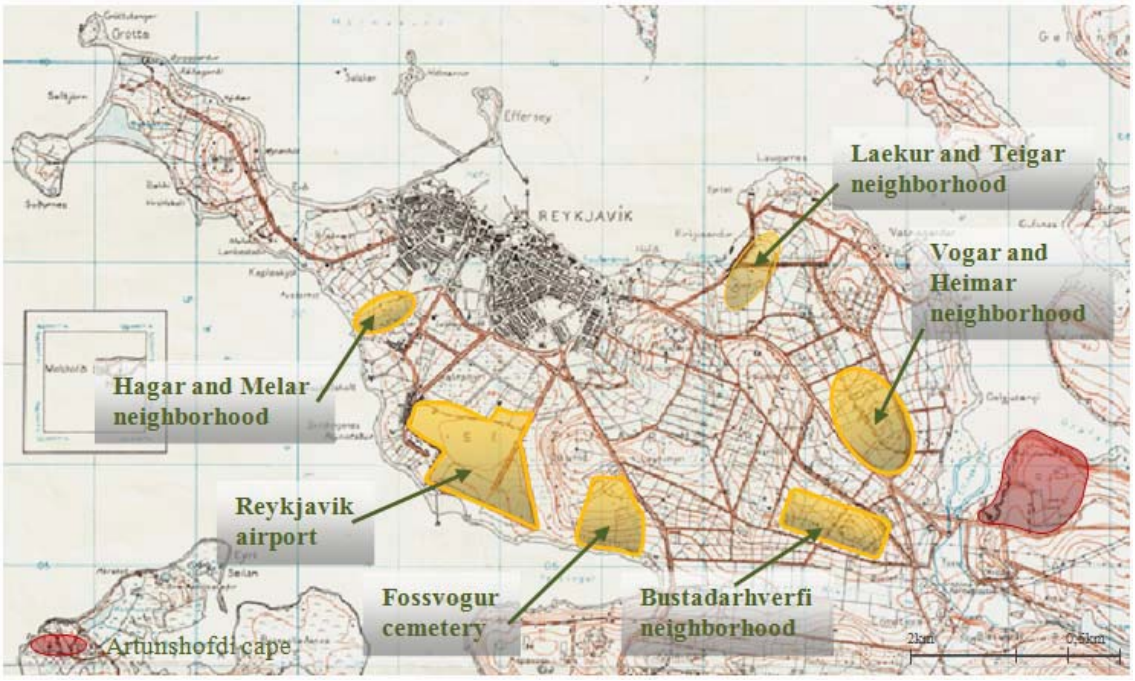


Figure 3-13: An army map from 1942 of Reykjavik (Söguleg kort, 2011) and the sprawling of the settlements 20 years after the war

Another factor that influenced the urban development of the peninsula was the existence of the farming areas of Reykjavik upland. Some of the farmers stood strong and did not immediately let the urban development of the city influence their farming activities. The farming activities in 1940

spread itself over a area of almost 7,7 km^2 (770 hectares) meanwhile the built area covered about 2,0 km^2 (200 hectares). Ten years later, in 1950, the farm lands had only been reduced to 6,7 km^2 (670 hectares) and the farming activities and open nature still put its mark on the appearance and the urban development of the town. In a broad spectrum the capital had more the appearance of wide fields of grass and a rough rocky nature than the appearance of urbanity, with street pattern and regulated structure of houses (see Figure 3-14). (Þættir úr sögu Reykjavíkur frá 1940, n.d.)

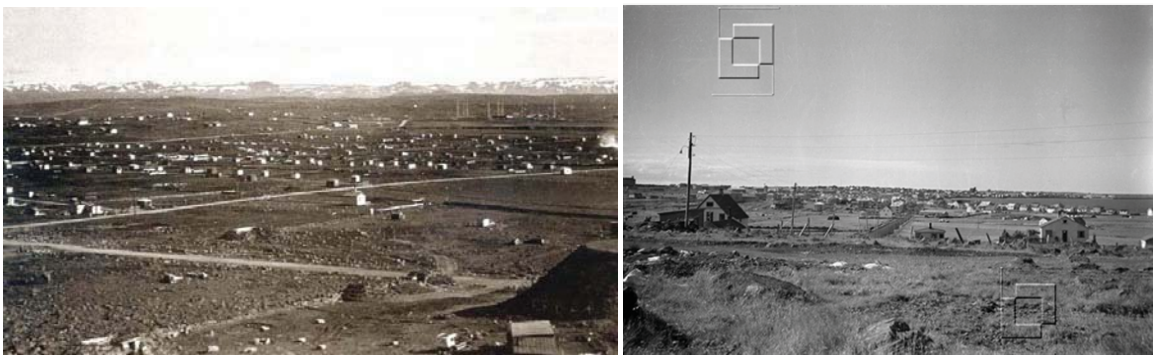


Figure 3-14: T.L. the Kringlumyri moor area in 1950 (Reykjavík - úr sveit í borg, n.d.). T.R. view over Laugaras and part of Laugardal valley in about 1950 (Ljósmyndasafn Reykjavíkur, n.d)

In 1950 -1960, the new more modern settlements as well as new regulations started to slowly constrict these old farming areas and the boarders between farming and modern city became more and more vague. The new regulations put the farming areas in the hands of the government by having them capable of taking ownership over the lands if the urban development of the city was in need of more land. The farmers were understandably not happy about these new regulations and did not approve with this urban development of the city. They found that the governments were showing them and the land dishonor. From that time on, farming inside the city boundaries slowly ceased and the last farmer in Reykjavik lived in the Laugardalur valley area. This farmer gave up in 1980-1990 and in 1990 the city opened up a domestic animal park nearby as a tribute to the farming tradition inside the city boundaries. (Þættir úr sögu Reykjavíkur frá 1940, n.d.)

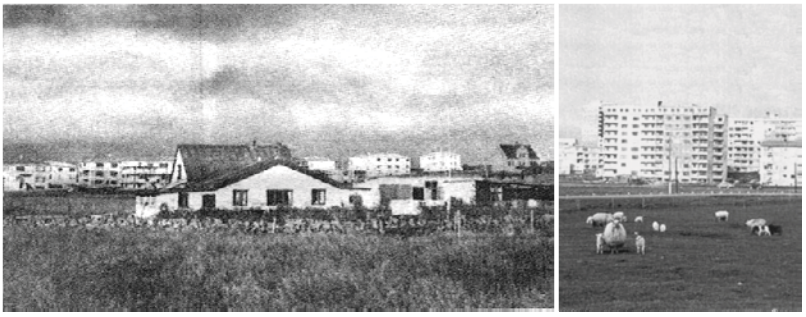


Figure 3-15: Close relationship between farming and urbanity. T.L The Miklatun green area, the farm Klombur (Reykjavík - úr sveit í borg, n.d.). T.R. Breidholt neighborhood (Valsson, 2003)

In these twenty years after the war, to 1965, Reykjavik had swelled to staggering seven times the size of its first master plan, Master plan from 1927. That means that the increase in area was 700% but meanwhile the population increase was "only" about 70% or from about 46,000 in 1945 to 78,000 in 1965 (see Appendix 2: Iceland in numbers).

The urban development practice had gone through many faces that left the city with large variation of building styles. This variation in building styles can be seen between different neighborhoods of

Reykjavik. The City Centre has a unique style and thus today it is said that Reykjavik is an assemblage of almost every type of planning and building style. (Valsson, 2003)

Figure 3-16: Different building styles, T.L. wooden houses of the city center 1942 (Footprints in the sand, n.d.), center, concrete houses of the down town 1942 (Footprints in the sand, n.d.), right bedroom neighborhood in Reykjavik (Valsson, 2003)

3.2.2 Reykjavik's urban development from 1965-1990

In 1976 and the upcoming years the border between Reykjavik municipality and Kopavogur municipality was getting more and more vague. The municipalities around Reykjavik were well aware of this problem but measurements of some common planning procedure in the past had failed. There had been worked on some common vision for the urban development of the municipalities surrounding Reykjavik from 1960, but a real union had never been established. It was thus first in 1976 that a union or collaboration was made between Reykjavik and seven municipalities around it. These eight municipalities cooperate today extensively in various fields but each municipality has its independent elected council. Together they form The Great Capital Area or the Capital Region (see Figure 3-17). (Valsson, 2003)

Figure 3-17: The Great Capital Area (Sveitarfélög, n.d.)

This unification was not the case in 1960 and thus the boarders of each municipality became an additional control might in the migration of settlements in Reykjavik municipality. Soon after 1960 the need for a new master plan emerges again in Reykjavik. Now the need for the new settlements to grow out of the peninsula was imminent. The land use of the municipality of Reykjavik had multiplied many times during its development and had now (includes Reykjavik uplands) reached far beyond the peninsula (see Figure 3-18).

Figure 3-18: The land use of Reykjavik municipality from 1793 - 1963 (Reykjavik Municipal Region, n.d)

Because of the great scale and magnitude of what a new master plan would bring to the Icelandic planners there were lounged a Nordic competition. A team of Danish planners were hired for lounging the competition but in the end their job were extended to the whole creation of the master plan. The master plan was published in 1965 and became the first master plan that was confirmed by the minister in charge of planning (see Figure 3-20).

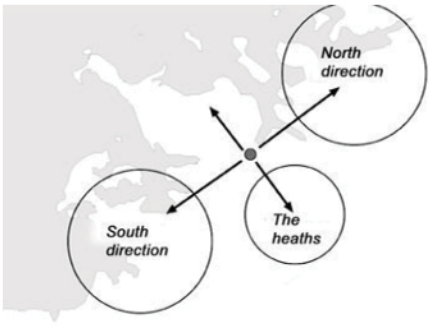


Figure 3-19: The possible directions of the urban development of Reykjavik (Valsson, 2003)

The first question in the planning process was in which direction the urban development should go when the peninsula ended. The south direction became a difficult one, as said, because of the boarders of Kopavogur municipality. The municipality of Kopavogur, refuse to co-operate and no action were taken, by the state, to emerge these two municipalities into one financial unification. Thus the south side became a closed area and thus the north direction and the so called heath direction were left standing. The Danish master plan from 1965 proposed a sharply division between areas according to land usage. The whole north side of the peninsula was still to be used for industry as well as harbor activities and this development should continue to the Artunshofdi cape area and now also to the Grafarvogur- and the Geldingarnes area (see Figure 3-20). This proposed development left only the heath direction left standing for the future development of Reykjavik municipality (see Figure 3-19). (Valsson, 2003)

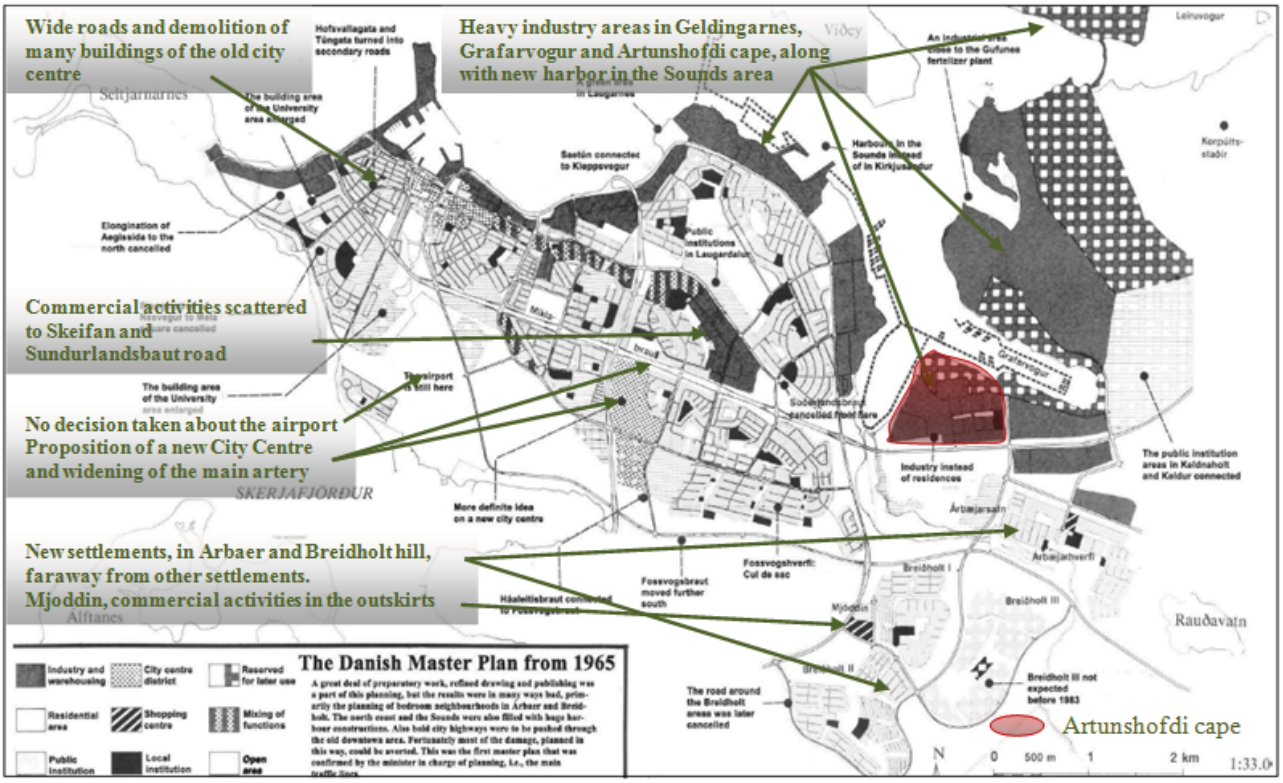


Figure 3-20: The Danish Master Plan from 1965 (Valsson, 2003)

The Danish Master Plan from 1965 had some new characteristics that are vital to pinpoint (see Figure 3-20). The first was that the Danish comity recommended that the old city center should have wide roads, i.e. secondary roads passing through the district. That was to support their overestimated decision about space needed for future commercial in the area. If this recommended action would have been executed it would have lead to tearing down of many of the historical buildings of the down town area. The second was that their plan took no action to the future position of the airport and that became the first part of a debate that is still running today. The third characteristic of the Danish plan was the idea of making a new city center in Reykjavik. This new city centre should be located in the Kringlumyri moor area and the main traffic arteries of the city, that should be widened, should insure the flow of people in and out of this centre. The fourth characteristic was the recommendation of building bedroom areas at Breidholt hill, which was located far away from Reykjavik's workplaces and the city center. This new neighborhood should be divided in three parts by road system that looked like fences and in the outskirts, Mjoddin area, there should be located a shopping mall. (Valsson, 2003) The last characteristic of the plan was that the plan lacked to elaborate on where to, the urban development of the future should head. (Valsson, 2003)

It can be debated if the Danish plan of 1965 were good or bad for the urban development of the city. Many of the bad recommendation, (see Figure 3-20) like tearing down of the old town could fortunately be averted by the work of some few ideologists. Some would say that the making of a new city center would have served the city well at this time, but it was delayed. This delay had a consequence that all the commercial activities that should have been constructed in this city centre were spread across the city, i.e. mainly to the Skeifan area and the Sudurlandsbraut road (Reykjavíkurborg, 2001). By planning for the Breidholt hill built-up, it was obvious that the Danish plan predicted that Reykjavik residential number would increase at similar pace as the prior years.

The opposite became the true as the residential increase was in minimum at this time as thinning of older residential areas became the reality instead. (Valsson, 2003) The last but not the least subject that was debatable was the huge emphasis on car usage that the plan recommended. This recommendation was reflected as well in the Reykjavik City Council scenario at this time as well as older planning methods in the world. The City Council meant that the emphasis on car and car ownership should have high priority, that people should have their own car to come about, in and at the outside of the city. (Valsson, 2003)

Many aspects of the Danish plan in 1965 were built on outworn planning methods that had left many foreign nation and cities in great difficulties. The plan thought the Icelandic nation the vitality of foresight and how important it is to be updated in the latest trends and theories of the planning profession. Almost immediately after the plan was adopted, preventive measure for the plan not to harm the city urban future was implemented. These measures had its origin in the Hippy Movement and the awakening in conservation and environmental concerns at this time. This circumstance prevailed in about seven years until the Reykjavik Development Office was established, i.e. in 1972. (Valsson, 2003)

When the Development Office started to operate there was again need for new master plan, a need that now had its origin in a new cause. At this time the reason was not increase in Reykjavik's population, as was the main cause for the making of former plans. Now the reason had its origin in a demand of Reykjavik's inhabitants for new, smaller and cheaper residential neighborhoods. The Breidholt hill area was mostly built between 1967 to1982 and it provided dwelling places for about 20,000 inhabitants. In this period of time Reykjavik inhabitants grew only approx 6000 persons so the thinning of the older residential areas was unavoidable. (Valsson, 2003)

The plan of the Development Office was published in 1977 and it is said to remedy many of the faults of the Danish Plan from 1965. In 1977 a collaboration between Reykjavik and the municipalities surrounding Reykjavik, mainly Kopavogur, was at its starting point. The plan does thus not include many of the aspects of co-operation between municipalities and thus the urban development still takes the heath direction (see Figure 3-19), now to the Mt Ulfarsfell area. (Valsson, 2003)

The main aspects of the Development Office plan in 1977 are for the first the Sundabraut road (see Figure 3-21). The road was planned to lie over the Ellidaa river bay, to Grafarvogur area and over to Geldinganes peninsula, with another bridge over to the Alfsnes peninsula. This new road construction was never built but it had ever since been a reason for heavy debating amongst Reykjavik inhabitants, politicians and planners. The second aspect was the built up of new residential area at the slopes of Mt Ulfarsfell. The same mistake for this area, as for the built up of the Breidholt hill area, should not occur. This area should be built up as an independent town with a new "city centre" or another City Centre that would connect residential areas and work places in the area. Now the Artunshofdi cape was entirely meant for industry and warehousing but the Grafarvogur area for mixed use and Geldingarnes partially for residential areas. More increase was now on environment and outdoor recreational activities and the plan included thus a system of paths for cycling and pony trekking in the city as well as design concept for open spaces and landscape plans. (Valsson, 2003) The plan includes the airport at its original location, i.e. in the Vatnsmyri moor area.

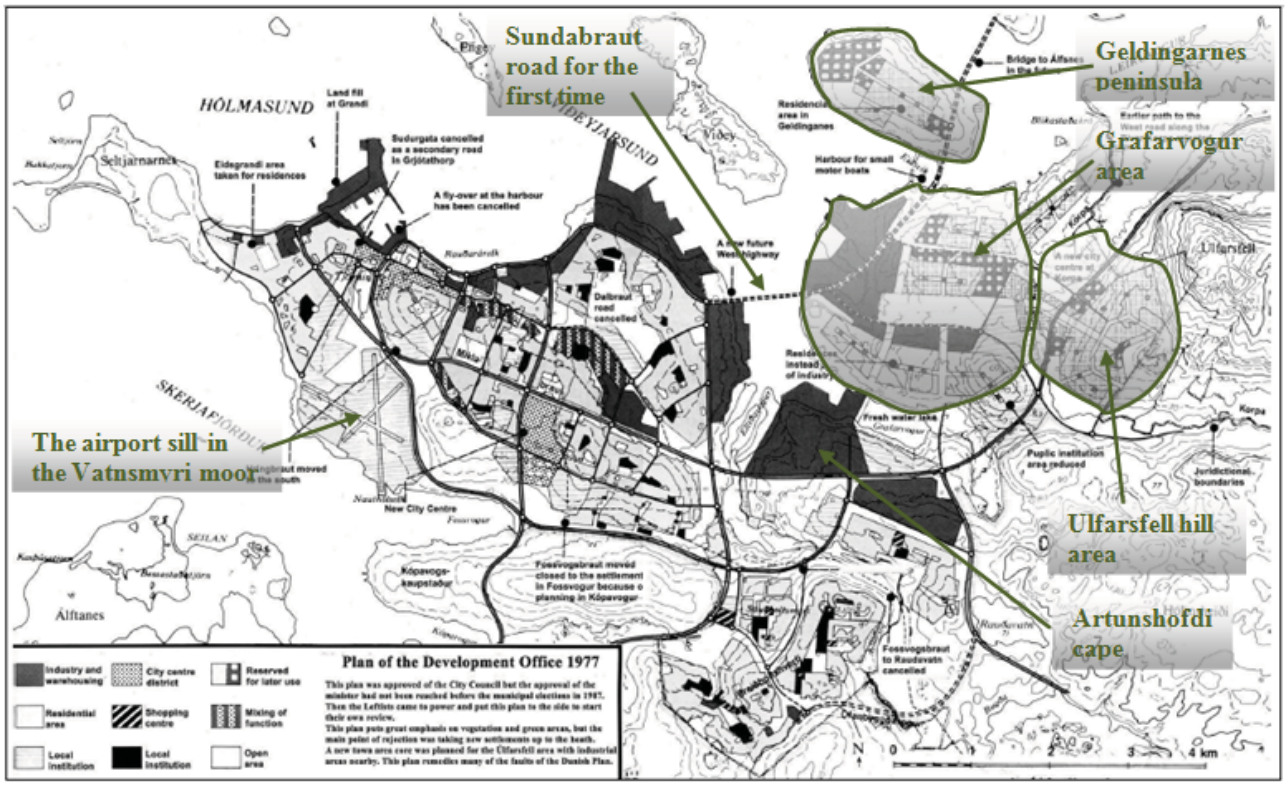


Figure 3-21: The Master Plan from the Development Office in 1977 (Valsson, 2003)

Till 1978 the political landscape and a turmoil caused by political unbalance had not had the great impact on the planning practice in Reykjavik municipality. Many years up to 1978 the Conservatives had governed and a stage of predominance monopoly had ruled the city. Because of this dominance of the Conservatives the planning practice did not experience large conflicts caused by a political struggle. This suddenly changed in 1978 when the Leftish won the city council election. The Leftist were eager to prove their worth as well as serving their futuristic vision for Reykjavik's urban development. Their vision did not go to well with the former visions of the Conservatives and many of the already planned projects and urban development were stopped. As can been seen from Figure 3-22 than the Conservatives plan was to develop the city to the north to the Grafarvogur, Mt Ulfarsfell and Geldingarnes peninsula area and thus turning against more densification of the earlier settlements inside the city. The Leftists decision was instead to develop the city to the east to the Raudavatn lake area as well as condensing the city settlements. In next elections i.e. in 1982 the Leftist had put the old "Conservative" master plan from 1977 aside and made their own master plan (see Figure 3-22).

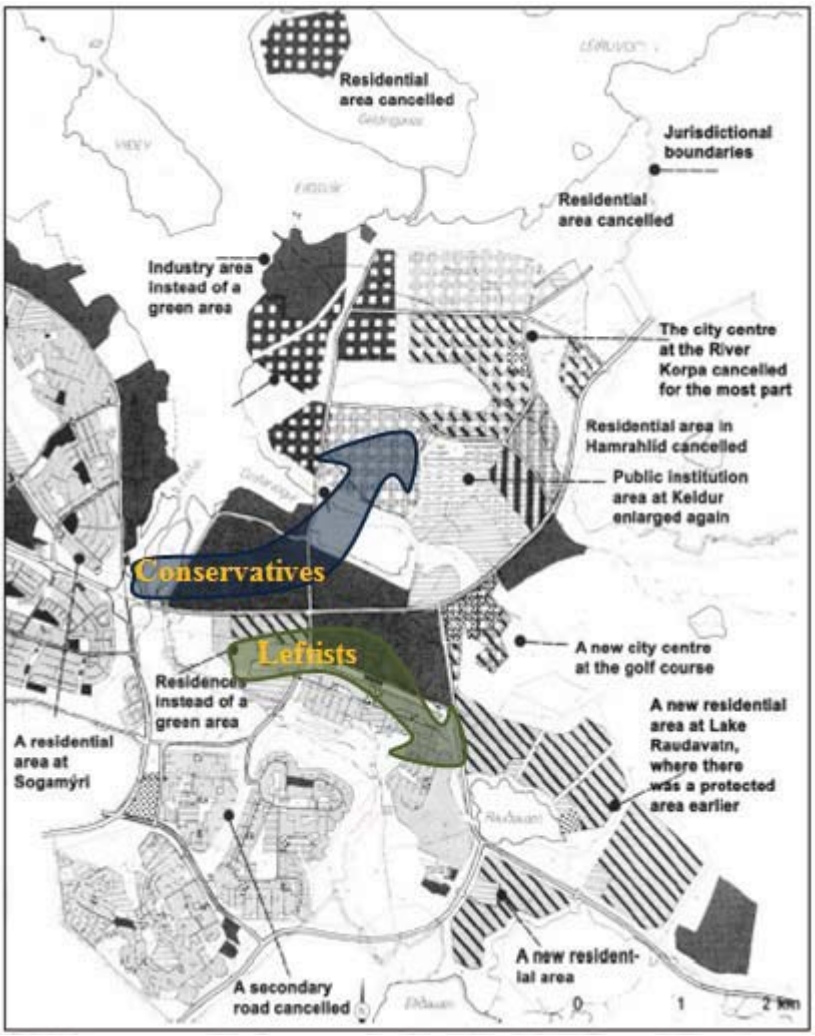


Figure 3-22: The Leftists plan from 1982. (Valsson, 2003)

With this plan the Leftists tried to win the election the second term but they failed it miserably. The Conservatives manage to pinpoint a fault in the planning of the Leftists, i.e. they had a map that showed rifts in the bedrock of the Raudavatn lake area that the Leftists did not know about. This became the downfall of the Leftists and the Conservatives regained their posture as a leading party. The first move of the Conservatives was to blow the dust of the old 1977 plan as well as blowing a new life into the projects that the Leftists had stopped in 1978. Almost immediately the planning policy of the city became the same as it was four years earlier, i.e. the Conservatives changed the planning policy again to their earlier policy and that resulted in a making of a new "updated" master plan, a Master plan for the period 1984 – 2004 (see Figure 3-23). (Valsson, 2003)

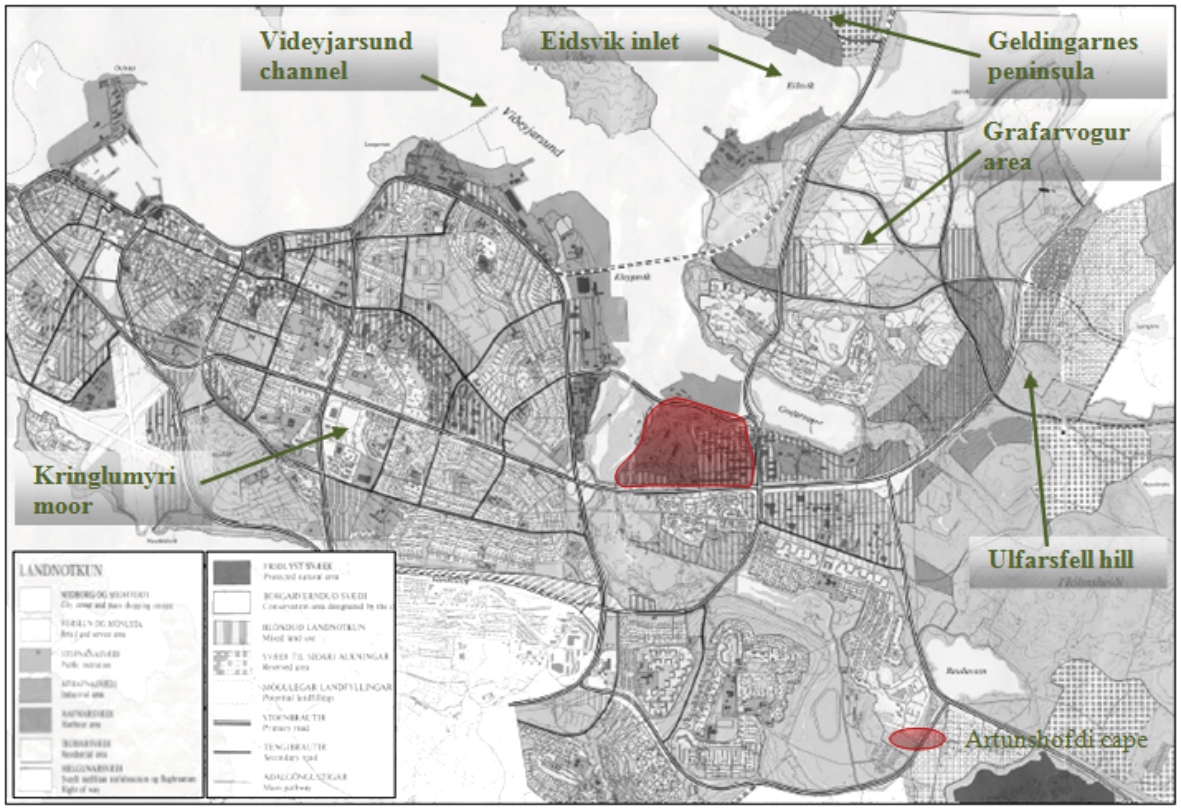


Figure 3-23: The 1984 - 2004 Master Plan of the Conservatives (approved in 1988) (Valsson, 2003)

A requirement was made that this new plan, which should span over planning period of 20 years, should be reviewed every four years, right before the city government elections. The main characteristics of this new plan was again further development of the residential area in the slopes of Mt Ulfarsfell and changed harbor in Videyjarsund channel as well as change usage of the Artunshofdi cape, Grafarvogur, Geldingarnes peninsula and Eidsvik inlet areas. In addition the plan shows further development of the commercial area in Kringlumyri moor, i.e. the construction of the first real shopping mall in Iceland the Kringlan. This plan proposal had always been criticized by the Leftists as by their meaning it would only burden the traffic system, leave an ugly mark on the city and mark the death of neighborhood shopping. This new plan rejected as well the ideology of the Leftists about a new residential area at the lake Raudavatn and a new city centre at the golf course close by (see Figure 3-22). (Valsson, 2003)

After the plan had been reviewed in 1990 this plan was published as a new plan valid for 1990 – 2010. The Leftists overtook the city council again in the 1994 election and a turmoil caused by political unbalance started again. (Valsson, 2003)

3.2.2.1 The actual transformation from 1965- 1990

Now there has passed further 25 years (1965-1990) of the urban development of the city of Reykjavik and the urban transformation had been colored by political- and municipalities conflicts. The urban development of Reykjavik had spread itself over the whole peninsula guided firstly by the airport and the cemetery and then the municipality borderline of Kopavogur. The inhabitation had mainly been on the west side of the Ellidaa river but first after 1965 the urban development of the Reykjavik's municipality can be said to have reached beyond the Ellidaa river and was invading the areas of Artunshofdi cape, Grafarvogur and Raudavatn lake (see Figure 3-24). (Valsson, 2003)

The population of Reykjavik had increased to about 20.000 in that period of time, from about 78.400 to 97.500, and was now about 38% of the whole Icelandic nation (see Table 3-2).

Population development and car ownership in Reykjavik from 1965-1990				
Year	Population of Reykjavik	Percentage of the Icelandic nation	Private car ownership	Private car per inhabitant
1965	78399	40,5	12700	6,2
1970	81693	39,9	17800	4,6
1974	84772	39,1	25974	3,3
1980	83766	36,5	32693	2,6
1985	89868	37,1	39627	2,3
1990	97569	38,2	44935	2,2

Table 3-2: Population and car development of Reykjavik in 1965-1990 (see Appendix 2: Iceland in Numbers)

In this period the private car ownership in the country had increased heavily from about 28.000 cars in 1965 to 120.000 cars in 1990 (see Appendix 3: Transportation numbers) It can be assumed that the 8 municipalities at the Great Capital Area had around 60% of those cars so the ownership was great and rising heavily as can been seen by the numbers for Reykjavik in Table 3-2. The increase in car ownership and, parallel, better road conditions had decreased the time spent on travelling in the Great Capital Area and thus in a way brought the municipalities closer to each other. This resulted though in that more inhabitants were investing in private cars and little were done by the Government and the municipalities administrations to facilitate and improve the public transportations options between and inside the municipalities. This era can thus also be recognize by slow progress and almost invisible public transportation, as not many were using the bus system and little progress were made in these matters. At this time in the development history there were operating two separated bus systems. One called Staetisvagnar Reykjavikur (SVR) that served Reykjavik, Seltjarnarnes and Mosfellsbaer municipalities and other Almenningsvagnar (AV) served the municipalities of Hafnarfjordur, Kopavogur, Gardabaer and Alftanes (Kjosrhreppur had non).

The municipality of Kopavogur started for real to gain population in 1970 and in a matter of few years it became the second most populated municipality of Iceland. This sudden growth of Kopavogur has its origin in its central location within the Capital region as well as, that time, lack of building lots of the central Reykjavik. Kopavogur started thus as a bedroom suburb of Reykjavik but at the end of the period it had managed to lure as well many companies and businesses. Kopavogur vast growth may have been influenced by the fact that there saw the Socialist an opportunity to stand firm against the Conservatives government in Reykjavik. These two municipalities have throughout the history had hard time getting along. Kopavogur status today is thus to an ever-growing importance for the urban development of the Great Capital Area. (Valsson, 2003)

If left out the clear political division, than can a similar story, as the one for Kopavogur, be told for the urban development of most of the municipalities of the Great Capital Area. Though that the eight municipalities had established a union in 1976 the cooperation had not resulted in an agreement on the necessary steps to take in the many common planning issues in 1990. This union had though resulted in that common planning matters became a part of the political agenda of all the municipalities. By this some common guiding principles in e.g. transportation routes and road

building has been achieved. (Valsson, 2003) The picture of the real urban development of The Great Capital Area in respectively 1980 and 1990 can be seen in Figure 3-24.

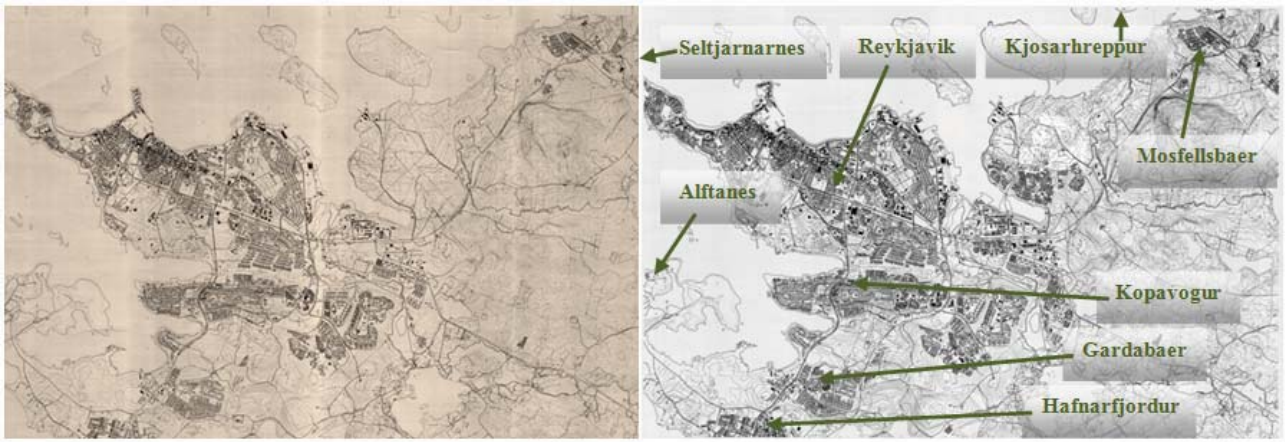


Figure 3-24: T.L. Reykjavik in 1980. T.R. Reykjavik in 1990 and the eight municipalities of the Great Capital Area (Söguleg kort, 2011)

3.2.3 Reykjavik's urban development at the turn of the century

The years after 1970 and especially after 1990 have been characterized by transparency and openness of the global environment. People have had more opportunities to travel and se about in the world. Educational- and travelling opportunities around the world are becoming more and more common and thus people are getting more acquainted with different urban environments. The requirements of liveliness and urbanity are now vital for many societies in a change of the earlier generations struggle and hard labor. These requirements and social changes are now as self-evident in Iceland as in many countries around the world. (Valsson, 2003)

Population development and car ownership in Reykjavik from 1990-2010				
Year	Population of Reykjavik	Percentage of the Icelandic nation	Private car ownership	Private car per inhabitant
1990	97569	38,2	44935	2,2
1995	104258	38,9	46272	2,3
2000	111345	39,4	66239	1,7
2005	114800	38,3	86134	1,3
2010	118908	37,4	72609	1,6

Table 3-3: Population and car development of Reykjavik in 1990-2010 (see Appendix 2: Iceland in Numbers)

The growth of Reykjavik came about because of people moving from the countryside to a city that offered great promise. The city became full of people that had background in farming and those had the need to live in residential neighborhoods that provided view and large openings and a certain distance to its neighbors. As the inhabitants became more educated and the borders of the world became vaguer due to e.g. international agreements and economic unions the needs and mindsets has changed. Now there is upcoming a generation that cannot relate itself to farming and fishing, but instead the urban lifestyle. Their dream is not to have endless open land and a view at the horizon from their flats or houses. Their dream is in urbanity where there is closeness to work,

school, shops, cafés and service. This generation embraces the life between the buildings and the opportunities that it provides for social contact, play, workouts and errands. (Valsson, 2003)

Up till the turn of the century Reykjavik had though been planned with great admiration for the car as is apparent in Table 3-3. Car ownership had been prerequisite for coming about in the city. This planning practice had lead to huge sprawl and great usage of space under transportation facilities, specially roads and parking spaces. Additionally the usage of public transport had inclined and gone from bad to worse as Chart 3-1 shows.

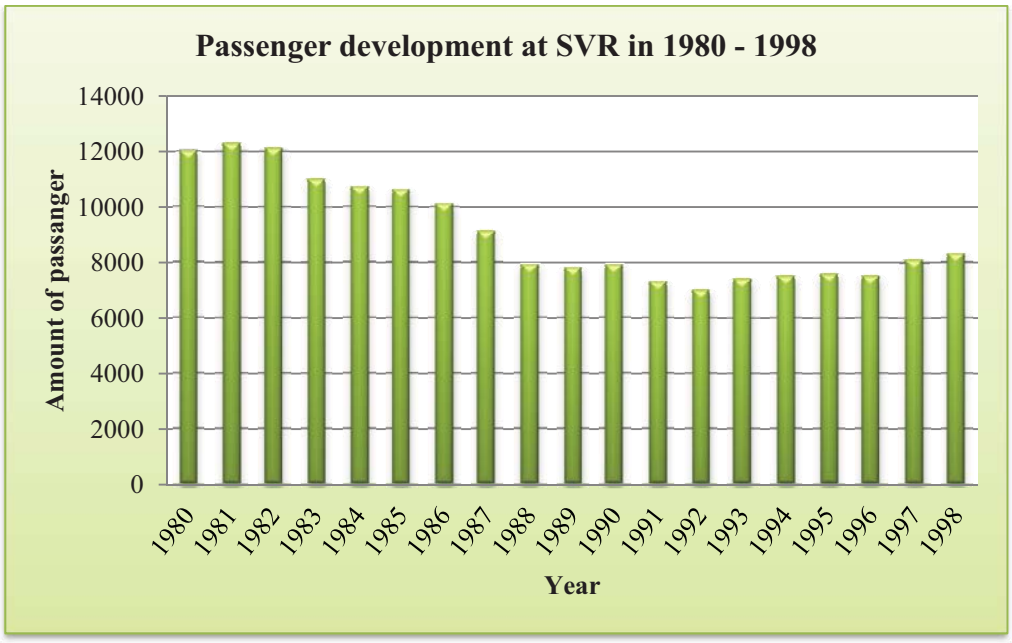


Chart 3-1: Passenger per year at Straetisvagnar Reykjavikur (RVK) in 1980 - 1999 (Guðjónsson, n.d.)

In the late 20th century and at the start of the 21st century many had had enough of this admiration for the car and were getting tired of all the time spent in car during the errands of each day. Modern citizens had also the knowledge of the pollution effect that a car orientated city could have and how expensive and deteriorating car dependency could be for the society as a whole. Lively debates rose thus in the society of how the congestion problems of the city would be solved in a new century. Tunnel projects were one solution, other pinpointed more and wider roads and some said improved public transport (metro, light-rail or trams) while other said better bicycle facilities. (Guðjónsson, n.d.) As one part of the response to these debates were to unite the two bus networks. In 2001 Straetisvagnar Reykjavikur (RVK) and Almenningsvagnar (AV) was united under a new coalition union and became called Straeto bs. (Stefna og saga Strætó bs, n.d.) This was done in hope of getting more increase in efficiency and a link in trying to redefine the public transportation system of the Great Capital Area.

At that time it was not only the young that sought and saw the great advantages of less car dependent life and the qualities of more urban living. As the situation was at the start of the 21st century with bad public transport system and many bedroom neighborhoods the only area that could provide this was the old City Centre. What the old City Centre had in liveliness it was though lacking in affordable housing and building areas. This actuality gave the lead to even heavier debates in the society, i.e. the location of a domestic airport in the heart of Reykjavik, the most expensive land in the country. (Valsson, 2003)

The Leftists party had been ruling the city from the election in 1994. In 1996 they gave the permission to re-build the airport, a decision that was highly criticized by many in the society. This subject gradually grew to a political sensitive issue and prompted a heavy debate there and in the society about the planning as whole in Reykjavik. Most likely as a election trick, the Leftists scheduled a referendum on the airport issue before the election in 2002. This they followed by a publishing of a reviewed Master plan, i.e. the Master Plan 2001-2024 (see Figure 3-25) (Valsson, 2003)

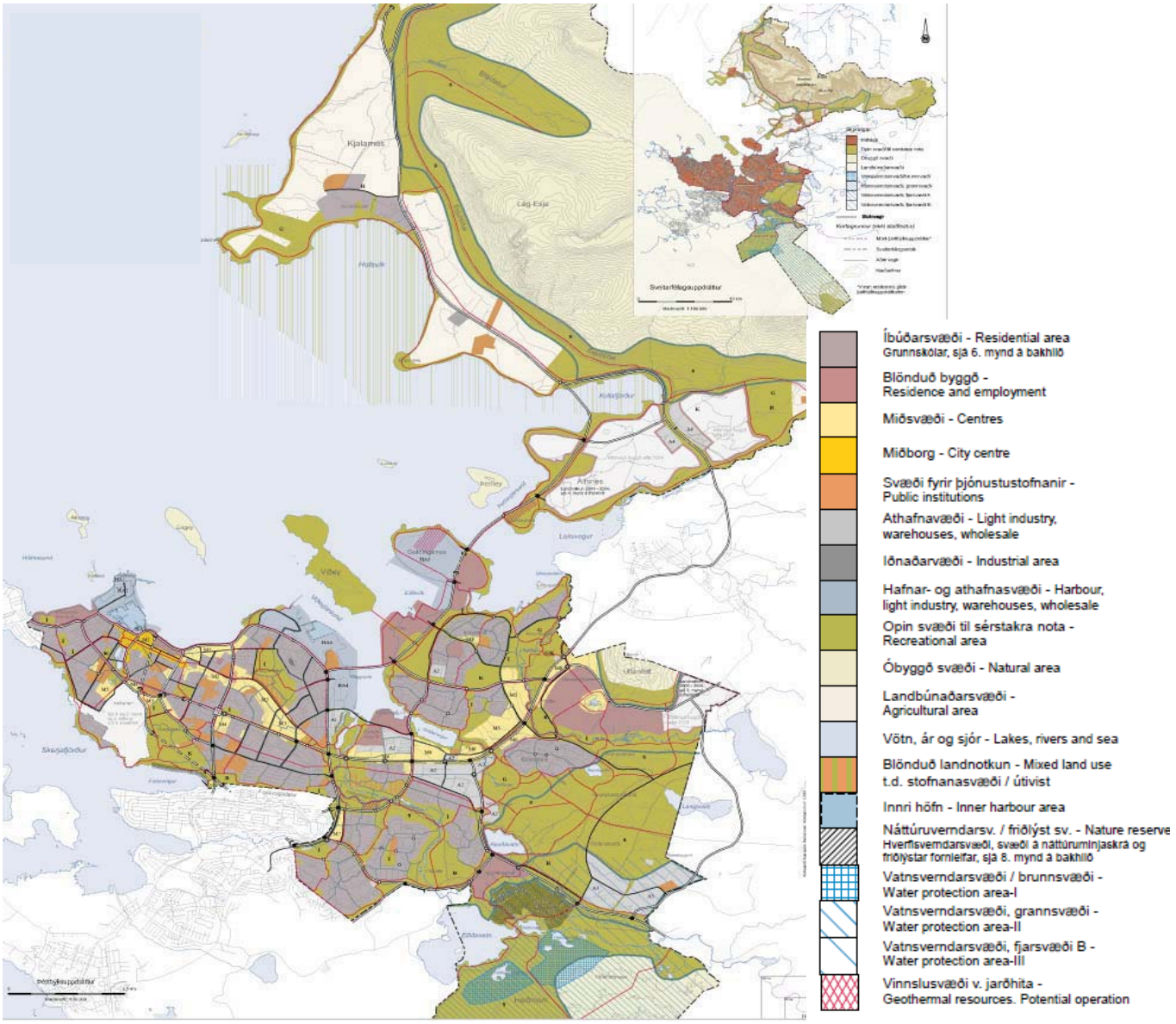


Figure 3-25: The Leftist Master Plan of Reykjavik 2001-2024 (Aðalskipulag Reykjavíkur 2001-2024, 2002)

3.2.3.1 The agenda of the Master plan 2001-2024

The current urban development plan in Reykjavik is the Master plan 2001-2024. The rule of reviewing plans every 4 years gave the majority of the city council (Leftist at this time) an opportunity to show their future policies and visions for the urban development of Reykjavik. As an addition to the Master Plan 2001-2024 the municipality of Kjalarnes was united to Reykjavik. This certainly gave huge advantage for both municipalities involved as Reykjavik got access to vital

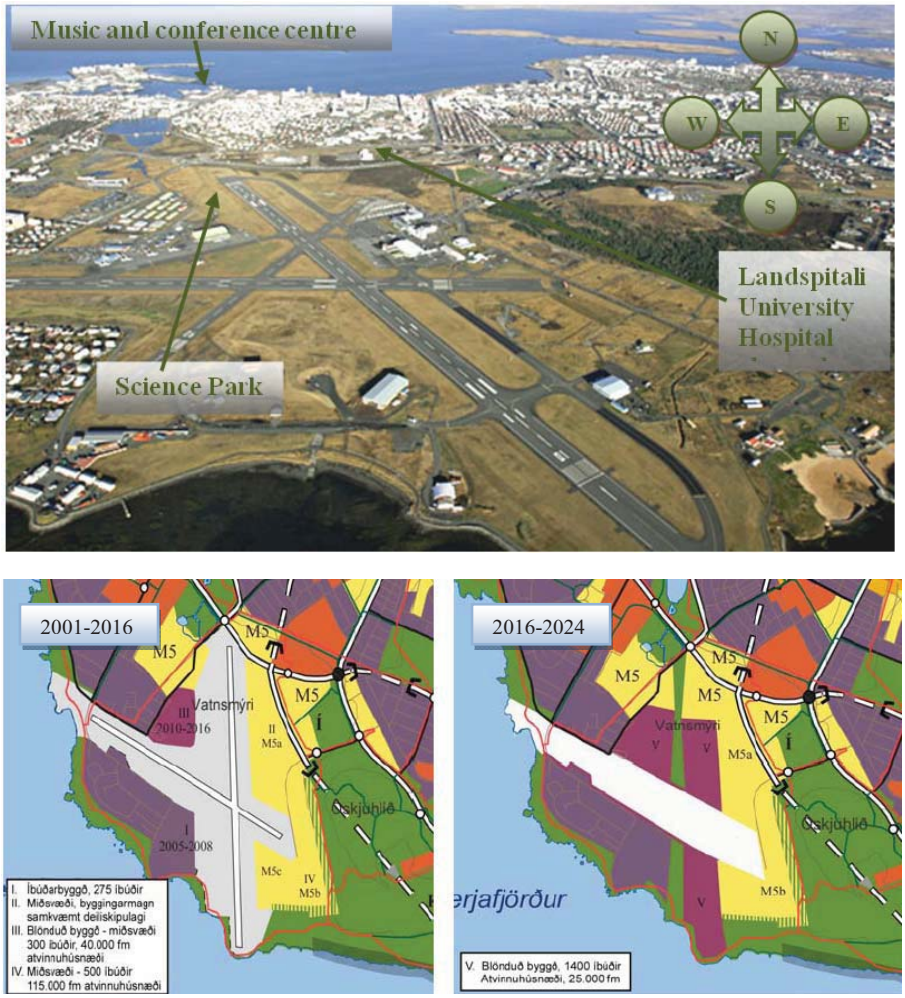
building land to the north, Kjalarnes became a part of financially strong municipality and together they formed a strong municipality. This plan also shows some projects that later became heavy debatable matters between the political parties under the elections in 2002. These were projects like how to strengthen the old City Centre, the buildup of the areas of Grafarvogur and Geldingarnes peninsula, usage of the island of the Sounds and the buildup of a harbor in Eidsvik inlet.

The political debate about strengthening of the old City Centre was the loudest before that election, though mainly the airport issue, enlargement of the Landspitali University Hospital and the built up of Science Park (a knowledge industry area) as well a Music and Conference Centre at the main harbor (see Figure 3-26). The Conservatives new leader at this time was a spokes man of the Science Park as well as the Music and Conference Centre and the main criticizes at this time were mainly the hesitation of the Leftists coalition to build new constructions in the area and to tackle the airport issue in a real manner. (Valsson, 2003) The public voted, in the referendum 17. Mars 2001, by a slight majority for relocation of the airport. The City Council were not bound to follow this result and thus the plan of 2001 - 2024 shows only that the airport will retrieve from the Vatnsmyri moor area in phases but no decision has been taken when it will finally be moved (see Figure 3-26). (Vatnsmýri, n.d.)

The struggle about the airport area became about that an agreement could not be reached between the City Council and the aviation authorities and the Ministry of Transport about where to locate a new airport. In order to put pressure on those the Leftists made (after the referendum in 2001) a draft for a reviewed master plan that showed only one runway (northwest-southeast runway) in the future plan of the area. This facilitated and opened up for more opened discussion about the airport issue. The opening up of the airport area would help the development of the planned Science Park of the University of Iceland as well as it most likely lead to the idea of building a University Hospital in this area rather elsewhere like Fossvogur Valley where a great part of the hospital activities already were located. (Valsson, 2003)

Set aside the political debate of the old town the Leftists coalition were also hard criticized by the Conservatives to offer two few and to expensive residential areas in e.g. Grafarholt area (see localities in Figure 3-23). The Leftist idea about large harbor in Eidsvik inlet was as well criticized as the Conservatives will was to reserve the area for residential usage as well as the whole Geldingarnes peninsula. The Leftists answer was in form of an agreement with Mosfelsbaer municipality to get the jurisdiction of the south slopes of Mt Ulfarsfell. The sprawl of the city should thus be maintained at a certain degree as this area should be used for further build up for residential neighborhoods. (Valsson, 2003)

The Master plan 2001 – 2024 is divided in two development timeframes or era for the Vatnsmyri moor area (that's why it is only showed with light gray color in Figure 3-25). The first timeframe is 2001 – 2016. In this era the plan is to remove the northwest-southeast runway and the east-west runway is to be at its place until the end of the Master plan in 2024. The Vatnsmyri moor area is to be developed as an integrated whole and the gradual retrieval of the airport will open up specific areas for further build-up (see Figure 3-26). [(Vatnsmýri, n.d.) and (Greinargerð I, 2008)]



I. Residential neighborhood, 275 apartments

II. Center area

III. Mixed use – center area, 300 apartments, 40.000 m^2 of commercial area

IV. Center area – 500 apartments, 115.000 m^2 of commercial area

V. Mixed use, 1400 apartments, 25.000 m^2 of commercial area

Figure 3-26: The two development era of the Vatnsmyri moor area, the airport (Greinargerð I, 2008)

It can be stated that the 2001-2024 Master Plan is an advocate of the new planning practice of the 21st century. It is the offspring of the Bruntland commissions report in 1984 (Our Common Future) and the Earth Summit of the United Nations (UN) in Rio de Janeiro in 1992 (see paragraph 2.4.1Sustainability). The plan is thus highly oriented on environmental issues in a broad sense and it highlights the principles of sustainability. (Valsson, 2003)

The societal changes in Iceland and Reykjavik have been enormous the last decades and the Master Plan is to grasp those changes. These changes are e.g. residential growth due to vast migration from the country, increase in car ownership and usage, changes in finance, industry and knowledge industry as well increased public awareness in environmental and urban development issues. (Reynarsson, n.d.)

Reykjavik course of action in urban development matters is thus to conduce towards more sustainability in its societal development. The aim is to condense the urban environment and build up mixed use neighborhoods, with the goal of decreasing the numbers of vehicular travels and improve the quality of the built environment. The green areas of the city shall be nurture and the possibilities for the inhabitants to stay and enjoy those kinds of areas shall be improved. Transportation system of the city shall be made more secure and there shall be promoted for more environmentally friendly transport, i.e. public transportation, cycling and pedestrian traffic. The

overall goal is thus to pass on the heritage meanwhile securing adequate living condition to future generations. (Greinargerð I, 2008)

To do so the future scenario of the 2001-2024 Master plan is to secure that Reykjavik maintain its statue of being a strong and fertile capital of Iceland. It shall be in a leading position in the field of knowledge and globalization where innovation and sustainability will promote its economic value that is based on Icelandic foundations. The point of direction is thus to strengthen Reykjavik's position as a capital and ecological city where new and traditional industries and urban environment are nurtured through efficiency and quality of the build-up area as well the principles of sustainability. (Greinargerð I, 2008)

3.2.4 Reykjavik urban development in the 21st century

In Iceland as in other parts of the world the planning practice has had the opportunity to grow and learn from their former mistakes. It has gained immense by the info-technology as well as various technical improvements in computer based ingenuity. This growth has lead to changes in views and visions of the society that in addition has influenced how the Icelandic society at the turn of the century was changing.

It can be stated that in 1980 there was a need for new planning methods. At this time the world had gone through many fazes of different planning processes, from the Industrialism and Capitalism in the 18th century to the utopists theories and functionalism, rationalism and positivism in the 19th century. In the late 19th century an international focus on environmental aspects erupted and the concept of sustainability saw the light of the day. This has been the leading planning tool in the 21st century in Iceland as well the Western Countries of the world.

3.2.4.1 Urban development administration

For urban development in Iceland there are 3 organizations levels, i.e. Regional-, Master- and Local Plans.

Regional Plans: Regional Plans are urban development plans that shall cover more than one municipality. Those are to mark the heading for the municipalities/regions involved and coordinate the land use as well as development in transport-, service-, environmental- and urban matters.

Master Plans: Master Plans are urban development plans for one municipality. Those are to mark the heading for each municipality concerning its land use as well as its development in transport-, service-, environmental- and urban matters.

Local Plans: Local Plans are urban development plans over defined areas, districts or smaller localities inside the boarders of a municipality. These are based on already made decisions in respective Master Plans.

Today The Great Capital Area is one, contiguity whole where the built area forms one united occupational- and service zone. Current Regional Plan for The Great Capital Area 2001-2024 was confirmed in 2002. The work of the collaboration committee did then stop and was not establish again until recently. During this time of absence many of the preconditions has changed as well as there has occurred many social- and physical changes in the society. These have taken place without further updating of the Regional Plan and it can thus be stated that the current Regional Plan for The Great Capital Area is outdated. Though most development practitioners agree on that it is necessary to have Regional Plan, the Regional Plan does not have much legally value. (Stefánsdóttir & Haraldsdóttir, 2010)As such it does not serve the purpose to have all the municipalities involved to

work totally at the same goals. As for now each municipality is working individually at individually goals, e.g. Reykjavik municipality is now working at a new, updated Master Plan (see paragraph 3.2.4.6) that is much more ambitious in its nature than the goals of the current Regional Plan or Master Plans of the other municipalities. As for now the municipalities boarders of the 8 municipalities at The Great Capital Area make a setting for various emphasizes in urban development. (Sigurðsson H. , Interview, 2011)

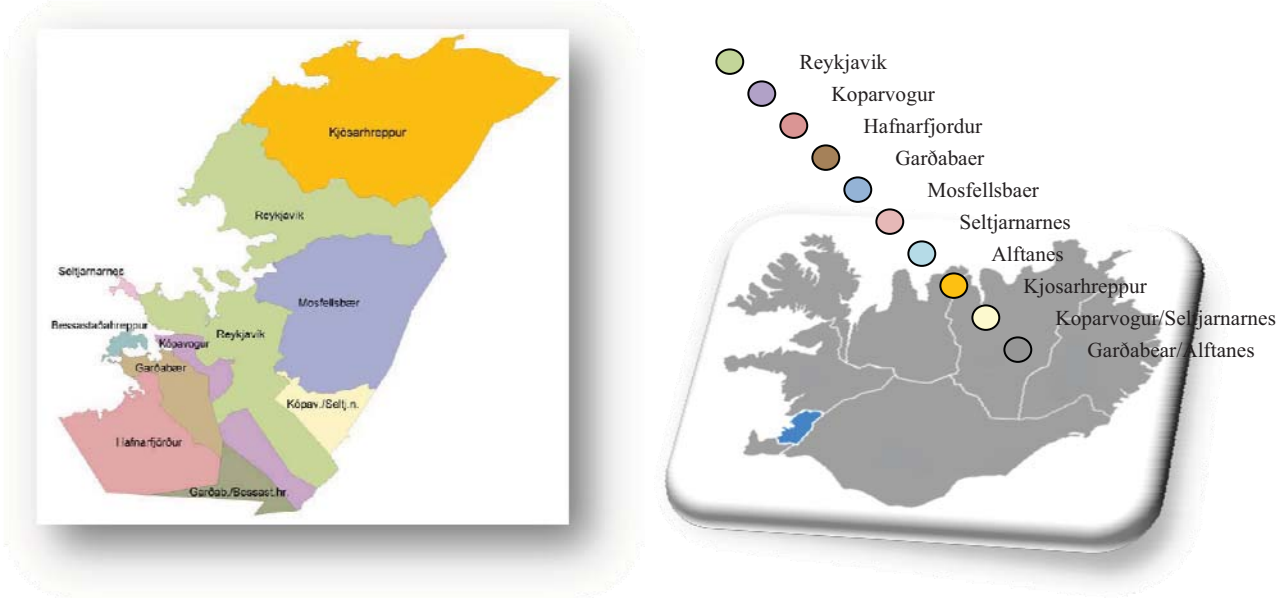


Figure 3-27: The municipality boarders of the 8 municipalities of The Great Capital Area [(Svæðisskipulag höfuðborgarsvæðisins 2001-2024, 2002) and (Sveitarfélög, n.d.)]

3.2.4.2 Sustainability of Reykjavik's urban development

> *"Global environmental problems are manifold and we Icelanders, like other nations, must shoulder our share in the global responsibility to seek changes and improvements. This means that we, like other nations, have to obey the policy of sustainable development within most areas of our society."* (Valsson, 2003)

To make this happen, the United Nations (UN) organizations were asked to sign declaration on global action in environmental improvements after the Earth Summit in Rio de Janeiro in Brazil. This declaration is called Agenda 21 and it is to serve as guidance for the cities of the world to gain more sustainability through global, national and local work procedures. In 1992 in Aalborg Denmark there was another conference where this work was preceded. At this conference the European cities took the matter one step further and signed a declaration called the Aalborg Charter. This declaration takes the Agenda 21 concept one step further to a Local Agenda 21. Local Agenda 21 calls on local authorities to implement the sustainability process locally with slogans like "Act local and think global". [(Almennt um staðardagskrá 21 - bakgrunnur, n.d.) and (Local Agenda 21, n.d.)] In 2000 there was held a conference in Iceland to further work on the sustainability progress. This conference was held in Olafsvik, a town in Snaefellsnes peninsula at west Iceland. The main purpose for the conference was to further develop the sustainability concept in Iceland and to have the municipalities to begin and further work with the principles of agenda 21. Reykjavik signed the Olafsvik declaration (Ólafsvíkuryfirlýsingin) already in 2000 and in 2010 the city signed the "Covenant of Mayors" a European municipality pact on climate change. Covenant of Mayors is for those municipalities that agree on to take the battle against climate change one step further and share the responsibility of fighting global warming. (Stefnumótun, n.d.)

There are primarily four municipalities policies that lead the urban development of Reykjavik municipality or its more sustainable urban development. These are the current Master Plan, Shaping Reykjavik, The Future is in the Air and The Transport Policy. Under those there have been made some vital strategies and implementation plans, implementations plan for Shaping Reykjavik the so called, Green Steps for Reykjavik and strategy plan, Reykjavik the Bicycle City, a strategy to anchor bicycling within the city. The current Master Plan has been described in paragraph 3.2.3.1 and will thus not been dealt with in the following.

3.2.4.2.1 Shaping Reykjavik (Reykjavík í mótun)

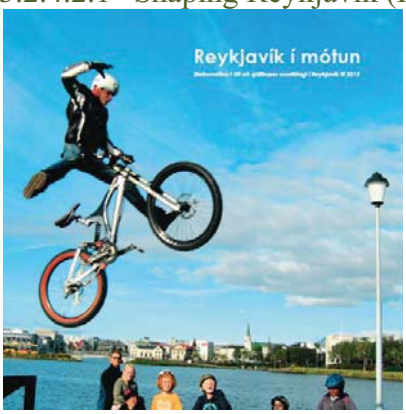


Figure 3-28: Shaping Reykjavik, municipality policy to conduce towards sustainability (Reykjavík í mótun, n.d.)

> *"The Local Agenda 21 (LA21) Campaign promotes a participatory, long-term, strategic planning process that helps municipalities identify local sustainability priorities and implement long-term action plans."* (Local Agenda 21 (LA21) Campaign, n.d.)

In Reykjavik a plan of action to follow through the concepts of Local Agenda 21 has been operated since 2001. The newest addition, Shaping Reykjavik (Reykjavík í mótun), was published in 2006 and it is to mark the direction for Reykjavik to 2015. Shaping Reykjavik is a general welfare plan that takes into consideration the three main aspects of sustainable development at a local level i.e. economic-, ecological- and community development. There are listed 9 goals for Reykjavik to become more sustainable in Shaping Reykjavik, i.e.: (Reykjavík í mótun, n.d.)

1. **Transportation**
   There shall be promoted safe and easy travel in Reykjavik without polluting the environment.
2. **Environment, public health and welfare**
   The activities of the City of Reykjavik are to take account of the synergy of environment, health and welfare of the inhabitants.
3. **Environmental quality**
   Reykjavík is to set an example in all fields relating to environmental quality.
4. **Nature conservation and outdoor life**
   Reykjavik will safeguard nature zones and promoting good access to recreational areas.
5. **Consumption and waste**
   Reykjavik will set an example in reducing waste production and promote yet more recycling and re-use of waste.

6. **Land use and buildings of the future**
   Reykjavik's municipality planning and building design is to reflect creative thinking and respect for Icelandic attributes and history.
7. **Green accounting and environmental management**
   The city of Reykjavik and business in the city are to set an example in the use of environmental management tools in an international context.
8. **Democracy and participation by citizens**
   The people of the city are to be active participants in environmental matters and in the shaping of their city.
9. **Environmental education**
   The city of Reykjavik shall promote education on environmental issues for the people of the city.

3.2.4.2.2 The Future is in the Air (Framtíðin liggur í loftinu)

Figure 3-29: The Future is in the Air, municipality policy to conduce towards sustainability (Framtíðin Liggur í Loftinu, n.d.)

It is evident that all nations in the world have a role to play in the release of greenhouse gases and particulates into the atmosphere. A united declaration to improve those matters was made in the Aalborg Charter in 1992. With this policy, The Future is in the Air, Reykjavik has taken a large step towards fulfilling the Aalborg Charter. The mission is to improve the climate and air quality inside the city boarders by reducing the release of greenhouse gases and particulates (PM10). As for now the main sinner in those matters is Reykjavik's transport sector and the city compost areas but other sources like pollution and particles from work premises, industry areas of the Great Capital Area and eruption areas in the heaths are also to blame (see paragraph 3.2.4.3). The Future is in the Air was accepted by the city government in 2009 and it involves 8 goals for Reykjavik to become more sustainable or environmental friendly concerning air pollution, i.e.: (Framtíðin Liggur í Loftinu, n.d.)

1. **Carbon (C) binding**
   There will be worked against the release of greenhouse gasses by binding carbon (C) with e.g. increased forestry.
2. **Transport**
   Reykjavik's release of greenhouse gasses from transport will be reduced and its influence on the air quality in the city will be improved.
3. **Urban development**
   Environmentally friendly transportation shall be the main criteria in urban development. This shall be done by choosing localities and operations with consideration to their polluting

affect on the climate and air quality. The aim is to reduce the greenhouse gas emission meanwhile increase the air quality.

4. **Construction progresses**
   Construction progresses in Reykjavik will be conducted in a way that it won't reduce the air quality of the city.
5. **Consumption and waste**
   Reykjavik will set an example in reducing waste production and promote yet more recycling and re-use of waste.
6. **Ecological management**
   Reykjavik's agencies and companies shall be more environmentally friendly so those can be a role model for the city businesses and individuals. By that there shall be created a better foundation for ecological products and services.
7. **External effects**
   The share of external factors in air quality in Reykjavik shall be minimized.
8. **Industry and agriculture**
   Best available technology should be applied to minimize emissions of greenhouse gases and pollutants, especially particulates (PM10), and odor from industry and agriculture.

3.2.4.2.3 The Transport Policy (Samgöngustefna)

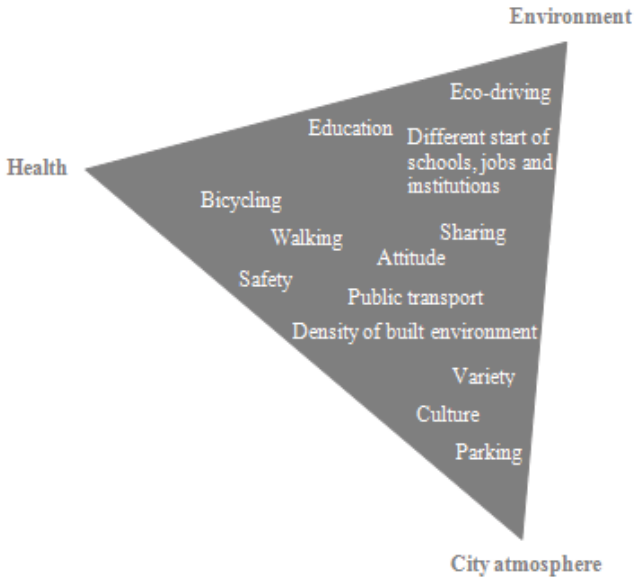


Figure 3-30: Reykjavik's Transport Policy and its Value Triangle (Samgöngustefna Reykjavikur, 2006)

The Transport Policy of Reykjavik's municipality, which was accepted by the city government in 2006, focuses on the aspects needed when developing a city and its transportation network. Its purpose is thus to be a guiding tool for Reykjavik's more sustainable urban development parallel to the Master Plan. Its vision is to have Reykjavik to becoming a city with good and safe transportation possibilities for all, independent of choose of transportation means. This shall be done by nurturing the three main values that are affected by transportation in a city, i.e. environment, health and city atmosphere. These values and the issues concerning are shown graphically in the Value triangle here above. The values are as said environment, health and city atmosphere and the issues concern are e.g. the effect on health that an increased usage of alternative modes of transport has, how parking places can affect the city atmosphere (the life between the buildings) and how increased knowledge and awareness in ecological transportation matters can improve the environment. By having an emphasis on those three values Reykjavik's Transport Policy is to ensure efficiency of Reykjavik's transportation system and to ensure equality between different modes of transport. (Samgöngustefna Reykjavikur, 2006) The goals from 2006 are following: (Sigurðsson Á. Þ., n.d.)

- **Increase bicycling from 3% to 6% in Reykjavik the next 20 years**
- **Increase walking from 16% to 21% in Reykjavik the next 20 years**
- **Increase the usage of public transport (buses) from 4% to 8% in Reykjavik the next 20 years**
- **Decrease the usage of private care from 77% to 65% in Reykjavik the next 20 years**

3.2.4.2.4 Green steps for Reykjavik

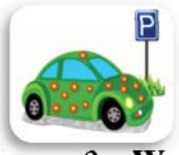
Figure 3-31: Green steps for Reykjavik municipality, an implementation plan for Shaping Reykjavik (Græn skef í Reykjavík 2009, 2009)

Green steps of Reykjavik are an implementation plan for Shaping Reykjavik. This implementation plan shows how the city of Reykjavik intends to lead the way and be a role model for companies and individuals in the campaign towards sustainability. This is a rather short sighted plan and is updated frequently. The first version of the plan was made in 2007 and included ten ecological steps and 45 sub goals or projects that should be worked on until 2010. In 2008, 90% of those goals were either finished or in progress so in 2009 the city council accepted a new revised Green Steps of Reykjavik. Now the steps are 12 with multiple sub goals as can been seen in the following: (Græn skef í Reykjavík 2009, 2009)

1. **Much better public transport**

   a. Better and easier payment system for bus fares
   b. Route manual, the search engine for buses shall become available on mobile phones
   c. Improve priority for buses on main roads
   d. Make experiments on heated waiting shelters in cooperation with Orkuveita Reykjavikur, Reykjavik's Energy Company.

2. **Incitements for ecological car transport**



   a. Reykjavik will work on and formulate a policy for service provided for ecological cars
   b. There shall be installed more electric outlets for electric cars

3. **We shall walk and bicycle more often**

   a. The walking- and bicycle path between Aegissida shore and Ellidaardal valley shall be widened
   b. A strategy to anchor bicycling within the city shall be made
   c. Get a new transport safety plan for Reykjavik accepted by the city council
   d. Water faucets shall be installed on the walking- and bicycle path between Aegissida shore and Ellidaardal valley
   e. Children's walking paths to school shall be mapped and introduced
   f. Walking paths that link residential areas of senior citizens to nearby recreational areas shall have installed heating elements
   g. Benches and railings will be installed on paths that link residential areas of senior citizens to nearby recreational areas

4. **Lively and entertaining city**

   a. Posthusstraeti street along Austurvöllur field will be a pedestrian street when weather is good
   b. Miklatun field shall be redeveloped in close cooperation with Reykjavik's residents
   c. More street sections will be made into ecological streets in accordance to the traffic laws
   d. The supply of vegetable gardens shall be increased
   e. Creation of city sweet spots. Reykjavik's collaboration projects about citizen participation and contribution in the making and maintaining of sweet spots within the city border shall be defined

5. **Better air quality for all**

   a. A policy to improve the climate and air quality inside the city boarders the next ten years, with the aim of reducing emission of greenhouse gasses shall be formed
   b. 500.000 trees shall be planted inside the city boarders
   c. The usage of studded tires will be opposed in close connection to the State and other municipalities
   d. Active surveillance will be held over the indoor clime in buildings that Reykjavik municipality has possession over

6. **Recycling**

   a. Garbage management will be improved with the aim of increasing the share of recycling

7. **Buildup of ecological neighborhoods**

   a. A new Master Plan of Reykjavik shall be made by the guidance of the principles of sustainability

8. **Ecological kindergarten- and elementary schools**

   a. All neighborhoods shall have their own nature areas/parks where teaching under open air can be preceded as well as environmental education

9. **Let's keep the city clean**

   a. The city center pond will be cleaned
   b. People will be encouraged to behave in better manner, concerning waste handling/management in the city

11. **The city of Reykjavik as an exemplary**

   a. When it comes down to ecology, the running of Reykjavik's city companies and diverse sectors shall be exemplary
   b. Reykjavik shall host international conference on eco-shopping
   c. A transport policy for Reykjavik city administration and activities shall be approved

12. **Reykjavik municipality work school**

   a. Reykjavik municipality work school participates in Green Steps of Reykjavik and will directly improve the physical environment of the city

3.2.4.2.5 Reykjavik the Bicycle City

Figure 3-32: Reykjavik the Bicycle City, a strategy plan to introduce bicycling in Reykjavik municipality (Hjólaborgin Reykjavík, 2010)

Reykjavik the Bicycle City is a strategy plan to introduce bicycling as a mean of transport to the residents of Reykjavik. The aim is to increase the share of bicycling in the city and open up the eyes of the inhabitants for bicycling as a realistic way to travel. The plan was published in 2010 and by that the foundation for improved bicycling facilities inside the city borders was laid out. By improving the bicycle facilities it is reckon that it will encourage the residents to use bicycle both for recreational use as well as doing errands and go to work. By that the share of bicycling inside the city boarders can be increased as well as the city sustainability. The recommendations given among other things in Reykjavik the Bicycle City are e.g.: (Hjólaborgin Reykjavík, 2010)

- **Reykjavik city and its government shall be a role model**
- **Use incitements projects amongst public, organizations and companies**
- **Marking bicycling paths so a division between walking and bicycling can be realized**
- **Get bicycling into transport design processes**
- **Improve bicycle skills of inhabitants**
- **Increase and improve education and information flow when introducing bicycling**
- **Promoting and define the bicycling network**
- **Promote and improve the correlation between bus and bicycling**
- **Improve maintenance and service for bicycles paths**
- **When planning and carrying out bicycles projects consultation to interest parties like National Union for Bicycling in Iceland (Landssamtök Hjólreiðamanna) shall be maintained**

3.2.4.3 Reykjavik's development in transportation matters

Figure 3-33: Intersection in Reykjavik to left (Umferðaröryggisáætlun 2002-2012, 2001) to right separated intersection of Reykjanesbraut and Bredholtsbraut roads (Samgöngustefna Reykjavikur, 2006)

Every form of transportation needs infrastructure and as such all forms have an impact on its surroundings. The need of infrastructure and thus the magnitude of impact are though heavily dependent on the type of transportation.

3.2.4.3.1 Pollution

Nationally causes transport about 20% and Industry about 75% of all Iceland's release of greenhouse gases to the atmosphere. In Reykjavik this is the other way around, transportation causes about 70% of all the release and that makes pollution due to transportation to be Reykjavik's main environmental health issue (see Chart 3-2).

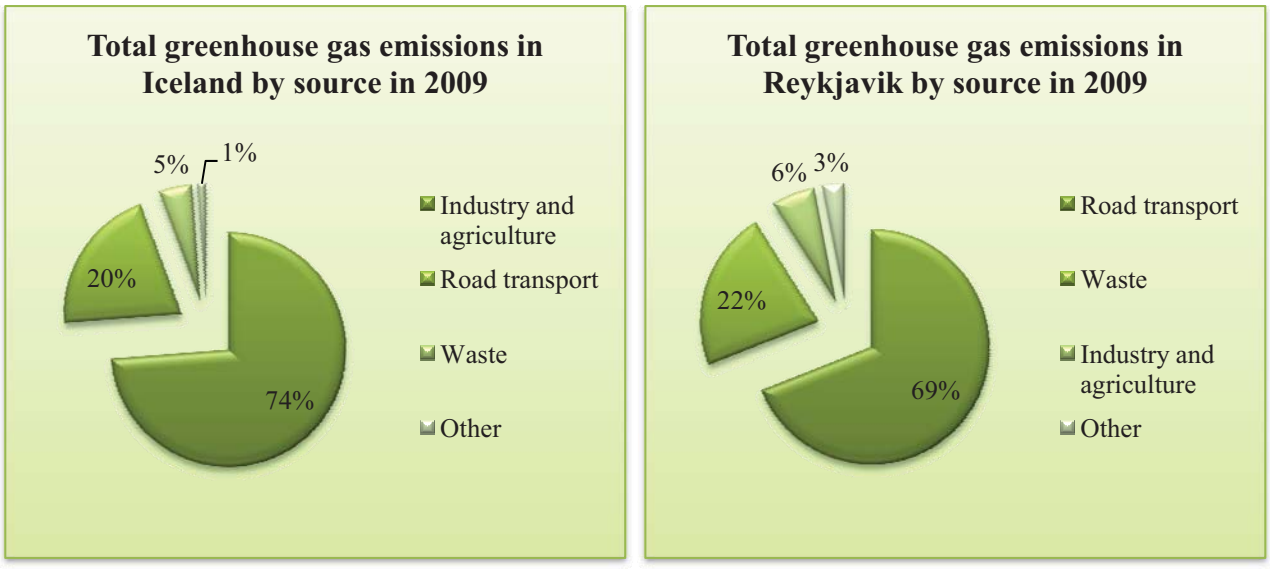


Chart 3-2: Greenhouse gas emission respectably in Iceland and Reykjavik (see Appendix 3: Transportation numbers)

Additionally does transportation increases pollution in form of noise and particulates (PM10), but particulates has its origin mainly from Icelanders heavy usage of studded tires. Motor driven transport is thus by far the largest sinner and primary the heavy usage of the private car. Parallel with changes in urban development and latest year's fluctuating economic situations Reykjavik's

transportation culture has changed significantly. In the middle of last decade, Reykjavik's private car usage and ownership were comparable to the once in Europe. Since then Reykjavik has developed into a city with by far greater car dependency than many of those European cities and can now most likely relate itself to many cities in America. Approximate 48% of Reykjavik's built area is for vehicular transport (see paragraph 3.2.4.4) and if not set to ease this number will only increase in the future as well as its polluting affect.(Samgöngustefna Reykjavikur, 2006)

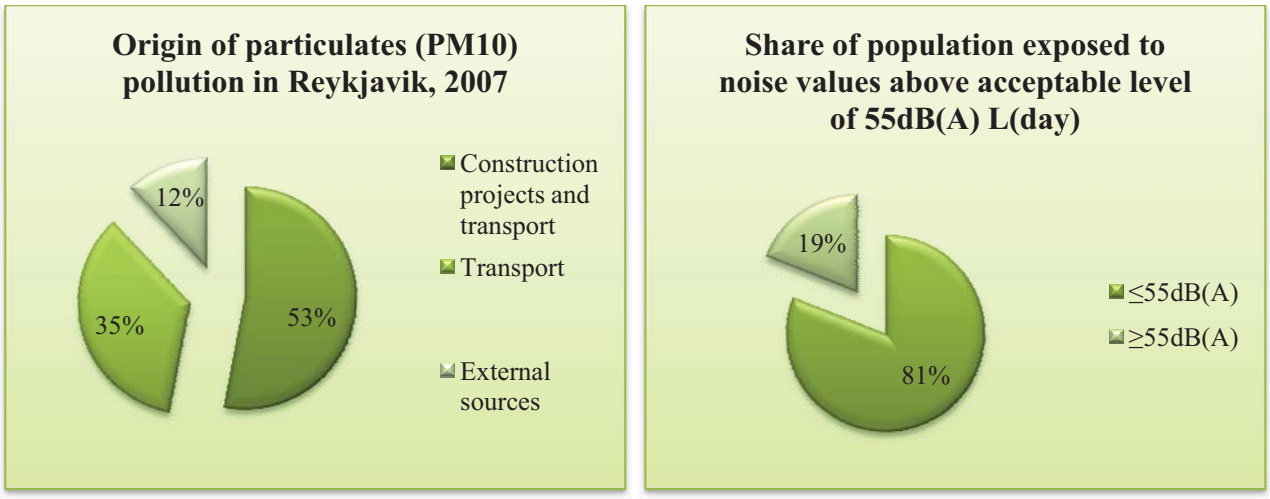


Chart 3-3: Pollution from particulates (PM10) in Reykjavik [(Samgöngustefna Reykjavikur, 2006) and (Framtíðin Liggur í Loftinu, n.d.)]

3.2.4.3.2 Car usage

Traffic and car usage has rapidly grown in Iceland both during this century as well as the second half of the last one. In the year 1950 there were 10.716 motor vehicles in the country and thereof the number of private cars was 6.380. Now, about 60 years later, these numbers has changed to staggering 237.089 motor vehicles were the private car is counted for 206.652 in total. The private car ownership has thus multiplied itself 34 times in this time period and was in 2010 about 87% of all motor vehicles (see Appendix 3: Transportation numbers).

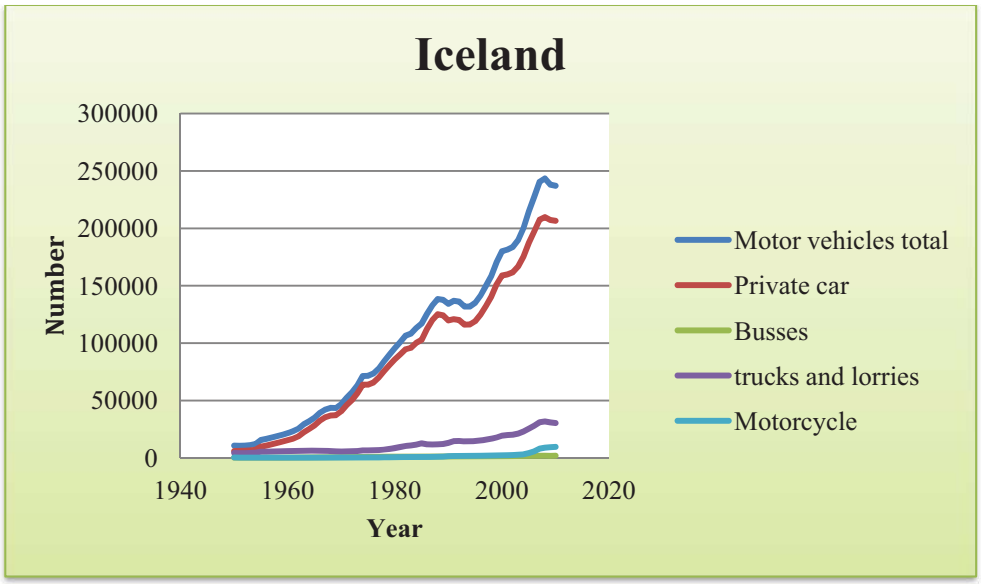


Chart 3-4: Motor vehicles growth in Iceland (see Appendix 3: Transportation numbers)

In 2010 there were about 757 motor vehicles per 1000 inhabitants in Iceland. There were 643 private cars per 1000 inhabitants meaning that there were 1,6 persons about each car (see Appendix 3: Transportation numbers). This gives that car ownership in Iceland rates probably as one of the highest in the world, at least higher than in most European countries. According to world statistics in this matter Iceland was ranked in top four from 2002-2007, where its "best" place was number one in 2005. (World Development Indicators, n.d.) The concerns are thus real on a national level in Iceland.

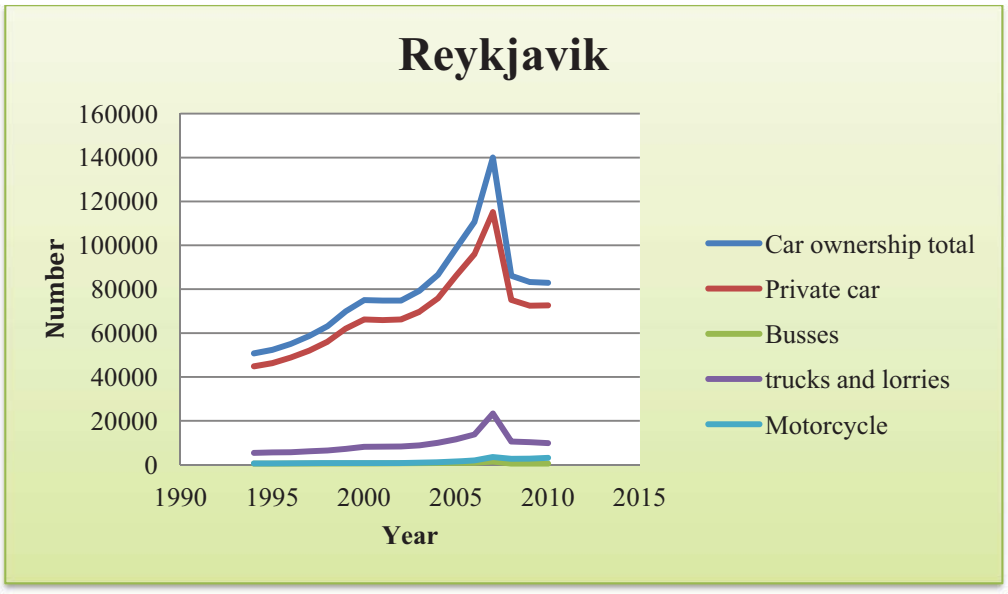


Chart 3-5: Motor vehicles growth in Reykjavik [See Appendix 3: Transportation numbers]

In Reykjavík the traffic and car usage has also grown rapidly. In the year 1994 there were 50.726 motor vehicles in the city and the number of private cars were 44.847. In 2010, these numbers has changed to staggering 82.929 motor vehicles were the private car counted for 72.609 in total. The private car ownership in the city has almost multiplied itself two (1,6) times during this time period

of 16 years. If this is not bad enough there was made some changes in registration of cars and motor vehicles between 2007 and 2008 (see Appendix 3: Transportation numbers) This change of registration was about that now motor vehicles were registered after where the car authority person lived but not the car owner. If the owner lived in Reykjavik but the person that used or had the authority over the vehicle lived in some of the neighboring municipalities e.g. Kopavogur the vehicle was under the new rules registered in Kopavogur. (Upplýsingatorg, n.d.)

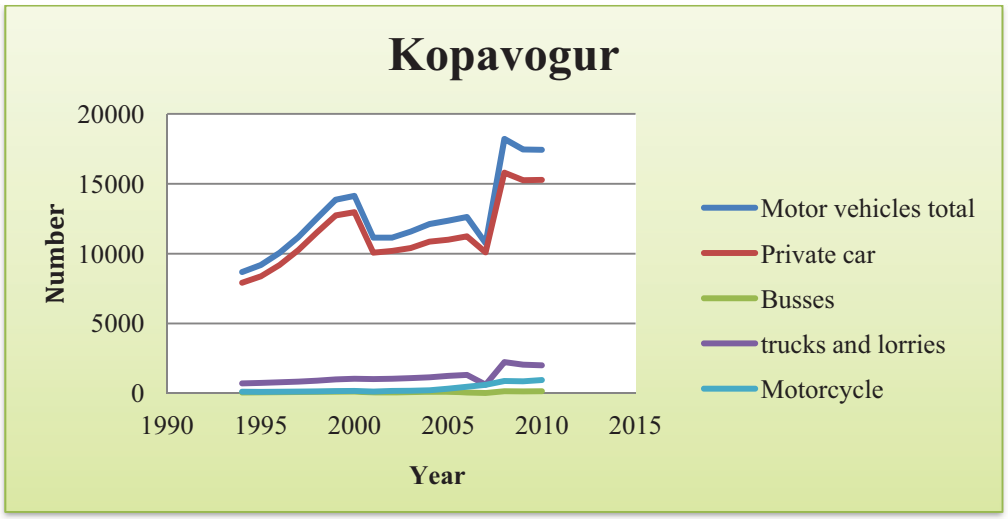


Chart 3-6: Motor vehicles growth in Kopavogur (see Appendix 3: Transportation numbers)

This gives a downfall in the numbers of vehicles for the Reykjavik area and rise to the numbers for e.g. the Kopavogur area as can been seen in Chart 3-5 and Chart 3-6. This could give misleading information to the actual usage of cars in the Reykjavik municipality and improve the image of Reykjavik in global context. If we look at the period 1994-2007 we can e.g. see that the private car ownership in Reykjavik had almost multiplied itself 3 (2,6) times in period of 13 years. It does not matter if we look at the first number or the latter, both numbers are alarming. In 2010 there were about 697 motor vehicles per 1000 inhabitants in Reykjavik. There were 610 private cars per 1000 inhabitants (1189 in 2007) meaning that there were 1,6 persons about each car (1,0 in 2007). If taken the age from 17 (car certificate age in Iceland) to 85, the prime age to drive car this number gets even lower or down to 1,3 persons per car. This again gives that car ownership in Reykjavik rates probably as one of the highest in the world, at least higher than most European cities (as can be seen from Table 3-4).

Number of cars per 1000 inhabitants in some of the countries and capitals/cities in the European Union							
Period: 2007-2009							
Belgium	480,4	Italy	605,1	Finland	509,5	Oslo	378,4
Brussel	485,8	Roma	707,4	Helsinki	-	Schweiz	517,5
Germany	453,1	Slovenia	515,9	Sweden	462,0	Zurich	389,3
Berlin	285,6	Ljubliana	547,4	Stockholm	369,8	Genéve	419,1
Netherlands	450,6	Austria	515,1	(Malmö)	394,3	Spain	-
Amsterdam	288,6	Wien	392,4	Norway	463,8	Madrid	484,1

Table 3-4: Car statistics for major countries and their capitals (see Appendix 3: Transportation numbers)

3.2.4.3.3 Travel pattern

It can be stated that average driving length of each journey in The Great Capital Area is about 6 km. (Umverfisáætlun Reykjavíkur, n.d.) This can be supported with the result from a survey that was executed in summer 2010 for the Icelandic transportation authority's. By this survey, that was a telephone survey with about 800 participants, there has been tried to get answers to questions concerning transportation pattern. According to the results then an average amount of journeys in The Great Capital Area (then one journey is a trip from point A to B) is 3,8 journeys that corresponds to that inhabitants in The Great Capital Area take in average 2 trips back and forth every weekday from their home e.g. to work and home and then to the grocery store and home. The average distance to work from inhabitants home is 6,4 km and in same manner the average time spent in car for each journey is between 10 and 11 minutes and for those that has not car it is about 21 minute. This, results in a statistics that for those who live in The Great Capital Area and have a car, spend an average 37 minutes in their car every weekday during the summertime, duration that can easily be 60% higher in the wintertime. (Könnun á ferðavenjum sumarið 2010, 2010)

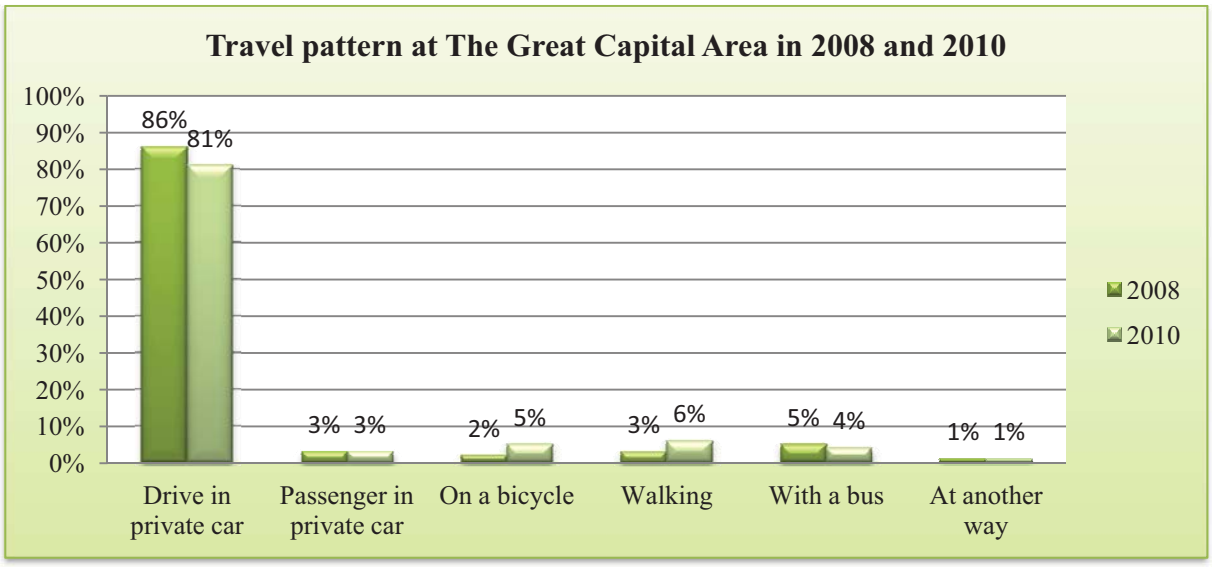


Chart 3-7: Travel pattern (modal split) of the inhabitants of the Great Capital Area, respectably in 2008 and 2010 (Könnun á ferðavenjum sumarið 2010, 2010)

Chart 3-7 shows the transportation pattern in The Great Capital Area according to this survey. It shows this overwhelming car usage of the residents and how little the alternative transportation means are used. Delightfully, does this graph show that the usage of the private car is decreasing from 2008 and bicycles usage and travel on foot is gaining strength. This can be explained in three ways either there has occurred change in way of thinking, an influences of the economical crises or plain simple that the survey in 2010 was executed at summertime but the one in 2008 during the wintertime. Luckily there was conducted also a survey in 2009 during the summertime that showed that this decrease in car usage was already started. (Könnun á ferðavenjum sumarið 2010, 2010)

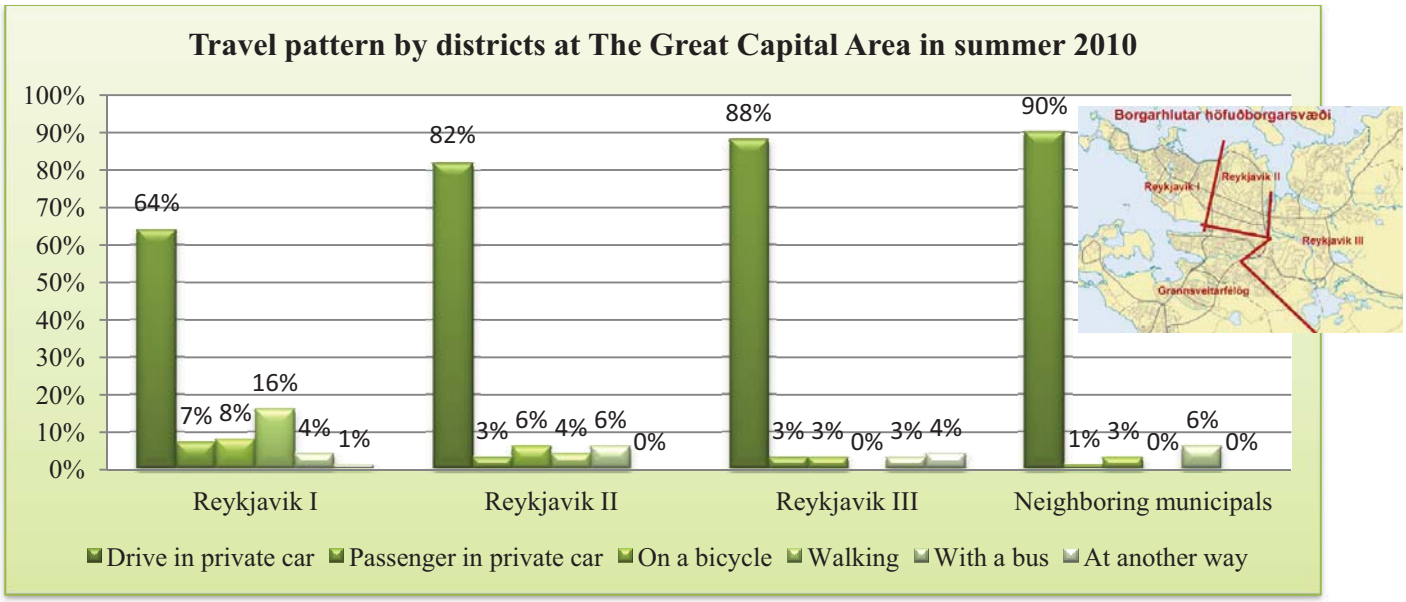


Chart 3-8: Travel pattern (modal split) in different parts of the Great Capital Area in 2010 (Könnun á ferðavenjum sumarið 2010, 2010)

The survey in 2010 shows a clear difference in travel pattern according to distance from down town of Reykjavik. The car usage in the area, Reykjavik I is much lower than in the districts farther away. In same manner the usage of the other transportation means is much higher than in the other districts (if looked aside travelling by public transport). (Könnun á ferðavenjum sumarið 2010, 2010) By this pattern it is obvious that most of those residents that work in the main administration-, commercial-, service- and education districts of The Great Capital Area, the Old City Center (and maybe the Kringlumýri area) of Reykjavik, travel thereto mainly in cars.

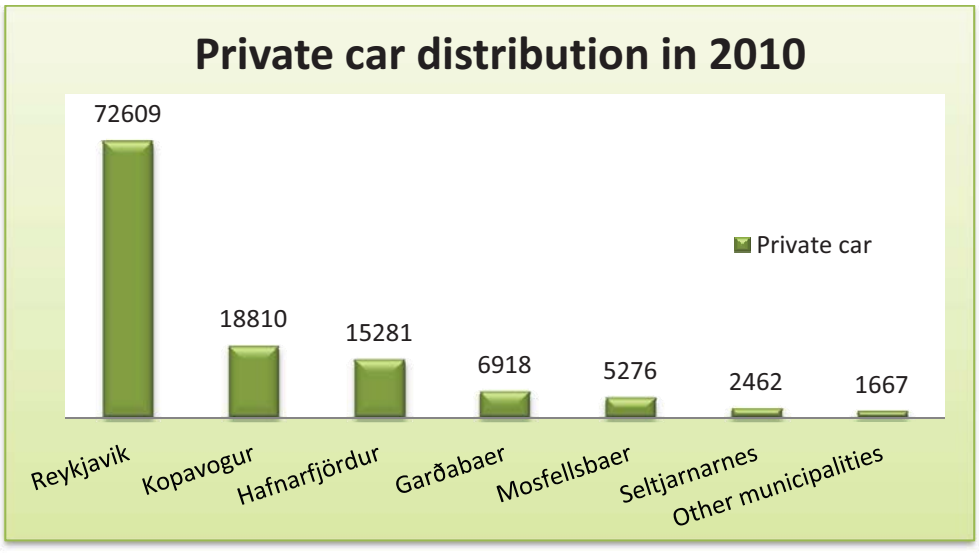


Chart 3-9: The distribution of the private car in the Great Capital Area in 2010 (see Appendix 3: Transportation numbers)

It is estimated that every day goes, through Reykjavik's transportation infrastructure, 70% of The Great Capital Area traffic. The Great Capital Area is estimated to hold about 60% of the overall national properties of motor vehicles so the burden on Reykjavik's traffic system is great and evident. The burden is especially hard on the main roads like Vesturlandsvegur (Ártúnsbrekka),

Miklabraut , Hringbraut, Kringlumýrarbraut, Reykjanesbraut, Sæbraut and Bústaðavegur. These are the main highways in Reykjavik municipality and they are the once that are most heavily loaded, especially during the morning- and afternoon traffic (see Chart 3-10). (Samgöngur, n.d.)

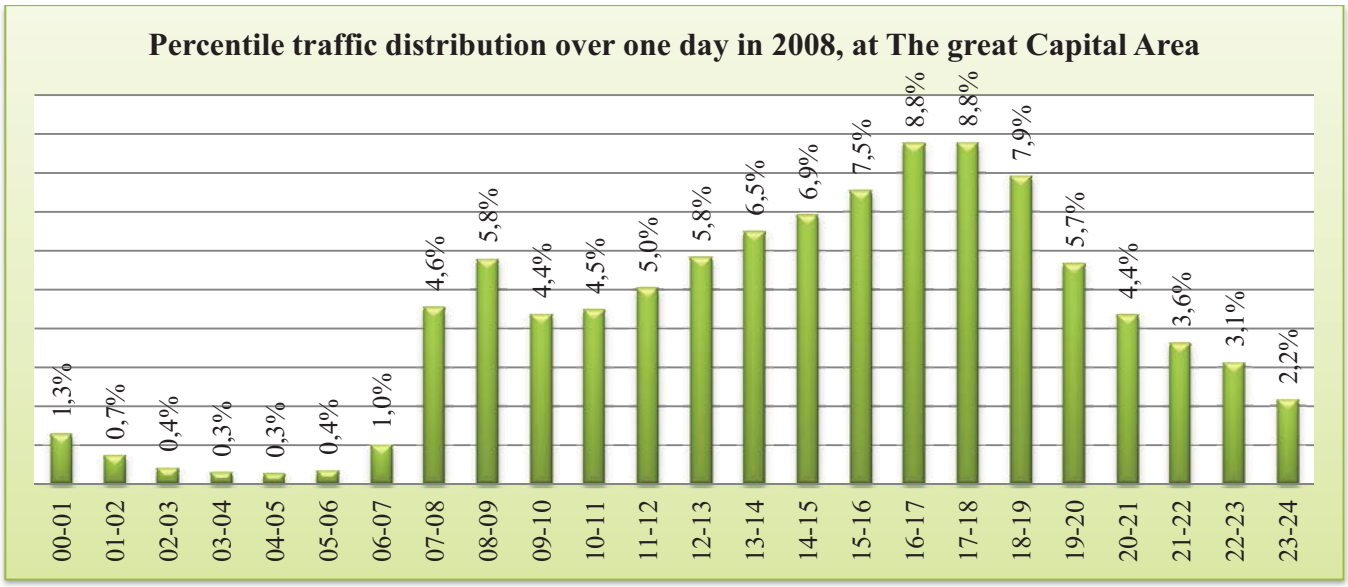


Chart 3-10: Comparatively distribution of the traffic in The Great Capital Area each day in 2008 (Klukkustundarumferð 2008, 2008)

3.2.4.3.4 Accidents and injuries

Additionally, then does those main highways possess a great danger to the ones that travel on and nearby. Sjova, an insurance company, made a rapport in 2010 for traffic accidents in 2009 where they claim that 69% of all Iceland's transport related accidents happen in The Great Capital Area. Within The Great Capital Area, Reykjavik has about 59% of all the cars and most of the traffic injuries and -accidents happen there as well as Chart 3-11 shows.

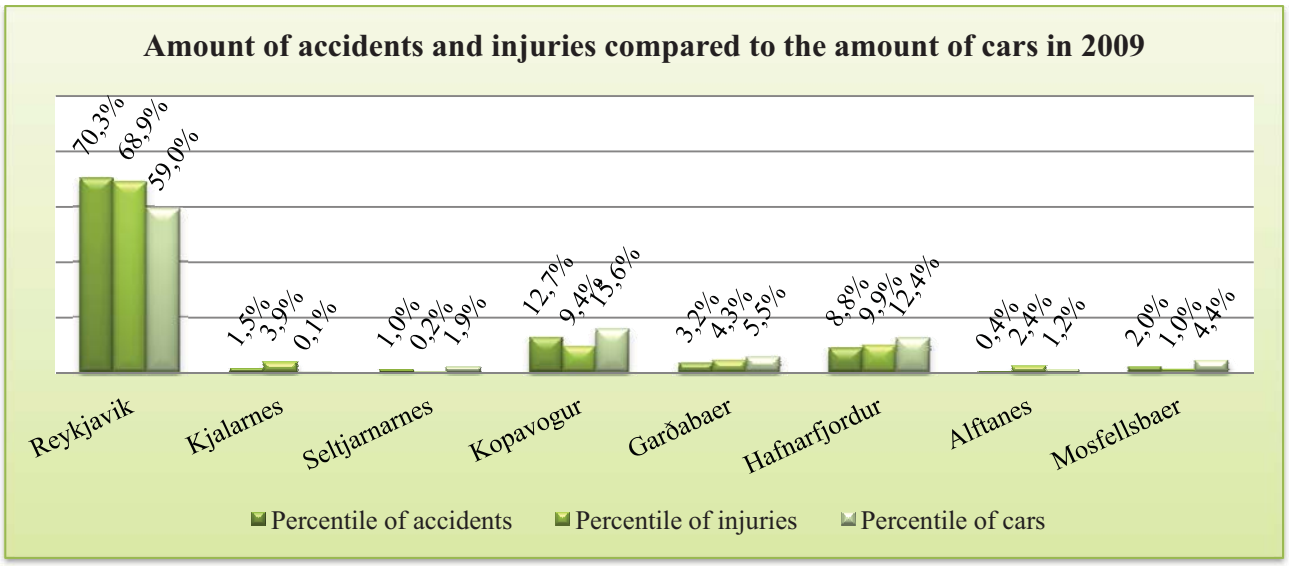


Chart 3-11: The amount of accidents and traffic related injuries in The Great Capital Area in 2009 (Guðmundsson, 2010)

Most traffic accidents and injuries in The Great Capital Area happen inside of Reykjavik's boarders according to this rapport. Miklabraut road is the one that has most accidents and Reykjanesbraut is the one that has the most injuries.

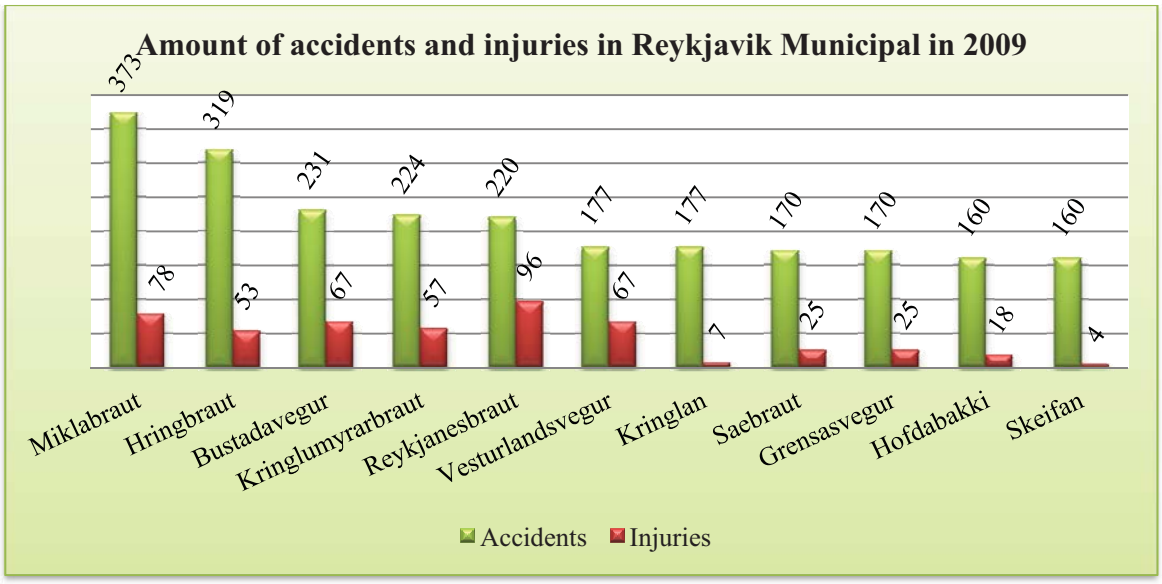


Chart 3-12: Amount of traffic related accidents and injuries in Reykjavik in 2009 (Guðmundsson, 2010)

Many of these main highways cross each other and by that make large and dangerous intersections. Eight out of ten most dangerous intersections are mainly related to the two largest highways, that is Miklabraut and Kringlumyrarbraut (see Figure 3-34). It shall though be pinpointed that resent years development has shown that the amount of accidents and injuries has been decreasing. (Guðmundsson, 2010)

Figure 3-34: Ten most dangerous intersections at The Great Capital Area in 2009 (Guðmundsson, 2010)

3.2.4.3.5 Changes in ideology

Interplay between urban planning and planning of transportation network is vital. By that it is possible to change and controls travels patterns as well as conduce to more environmental and sustainable solutions. The tradition in Reykjavik as well in The Great Capital Area has been to change the streets and highways by the need or requirements of the increased car ownership and -usage. Streets have been widened and new street lights, roundabouts and intersections have been added with the aim to increase the traffic flow. These solutions are now known as only to maintain the real problem that is this ever growing car usage, -need or -dependency. Only by decreasing the need or dependency for the car, the more environmental and sustainable solution can be gained. This will only be done by increasing the part of public transport and the alternative modes of transportation, bicycling and walking. (Samgöngur, n.d.)

This could be done by condensing the built environment as well as conducing towards more mixed use of it. This could change the travel pattern that could reduce in general the daily travel length from people's home to work and to the service needed. The transport network for public transport and the alternative modes should as well be improved. That would facilitate the ones that choose those ways of travelling and make the decision easier for those that are more skeptics. People shall as well be encouraged to use those modes of transportation instead of using the car. Improved knowledge shall be giving right from the start and the government as well as the inhabitants has to change their sentiment towards those means of transportation. The latter year's development has shown certain retroversion towards those matters in The Great Capital Area as Chart 3-13 shows.

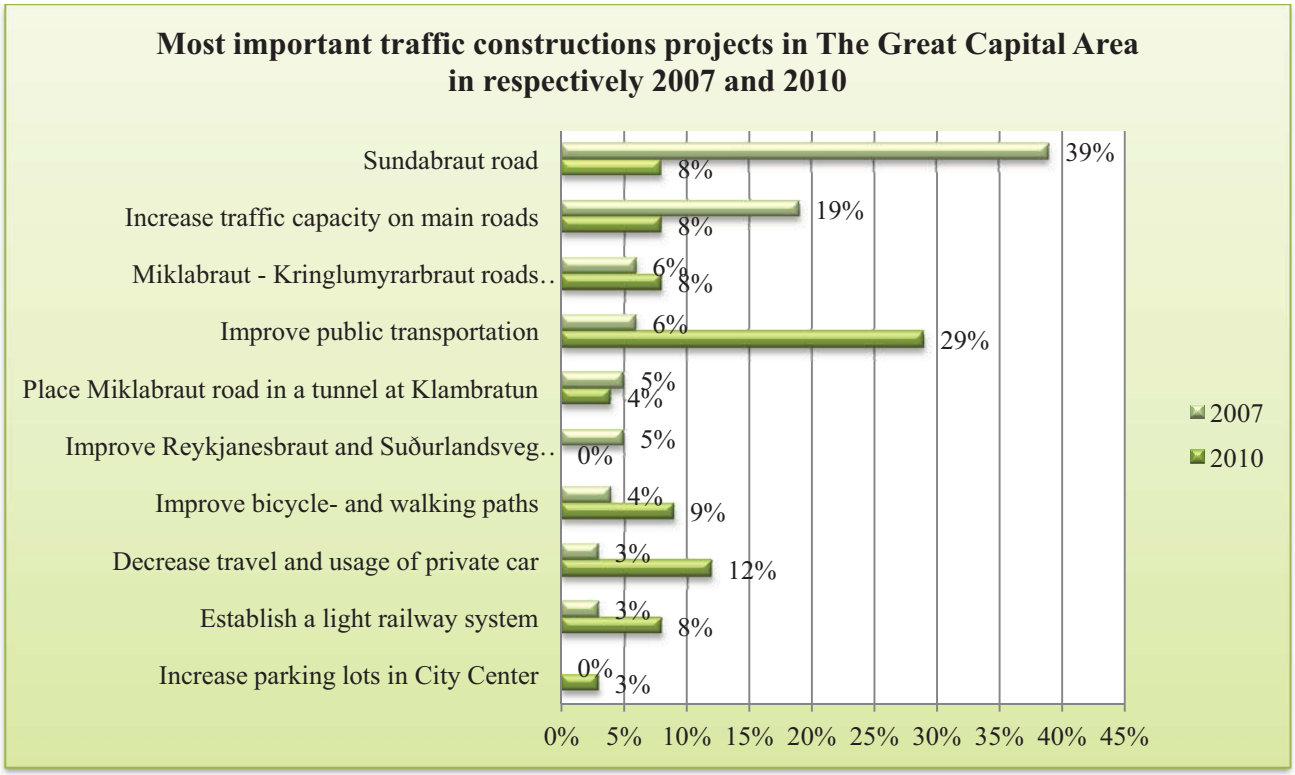


Chart 3-13: The main transportation improvements in The Great Capital Area (Könnun á ferðavenjum sumarið 2010, 2010)

Chart 3-13 shows that the inhabitant's ideology has changed since 2007. In 2007 there was a will to expand and facilitate the car dependency but now people wants to reduce this dependency and the usage of the privet car. People's priorities have changed and now people want to improve the public

transport as well as bicycle lanes and walking paths of The Great Capital Area. (Könnun á ferðavenjum sumarið 2010, 2010)

3.2.4.3.6 Public transportation

Figure 3-35: Typical buses in The Great Capital Area. T.L. diesel driven bus and T.R. Methane driven bus (Strætó, bus network in Reykjavík, n.d.)

Public transportation in Iceland is rather skimpy, meaning that in general Icelanders only public transportation means are buses (there are though special transportation means (special buses) for disabled and elderly). As mentioned earlier there is one company, Straeto bs, that operates all The Great Capital Area city buses and its main function is to serve in best ways for the inhabitants considered the annual budget given.

Straeto bs is owned and operated through coalition of 7 most populated municipalities in the Great Capital Area i.e. Reykjavik, Kopavogur, Hafnarfordur, Gardabaer, Mosfellsbaer, Seltjarnarnes and Alftanes (Kjosarhreppur is excluded). The executive committee of Straeto bs is thus formed of one member of each municipality involved and shall he/she additionally be a member of the municipality in question administration. This executive committee is election period is two years and head of the committee rotates between the municipalities involved and the tasks at hand are totally up to the executive committee. (Eigendur og stjórn, n.d.)

The work principles of Straeto bs are to constantly improve its service level and attract new customers with the aim to increase the overall ration of public transportation in the city. By that the vision is to offer to The Great Capital Area inhabitants a transportation mean that is more beneficial and environmental friendly then travels by private cars as well as even less time consuming. (Stefna og saga Strætó bs, n.d.)

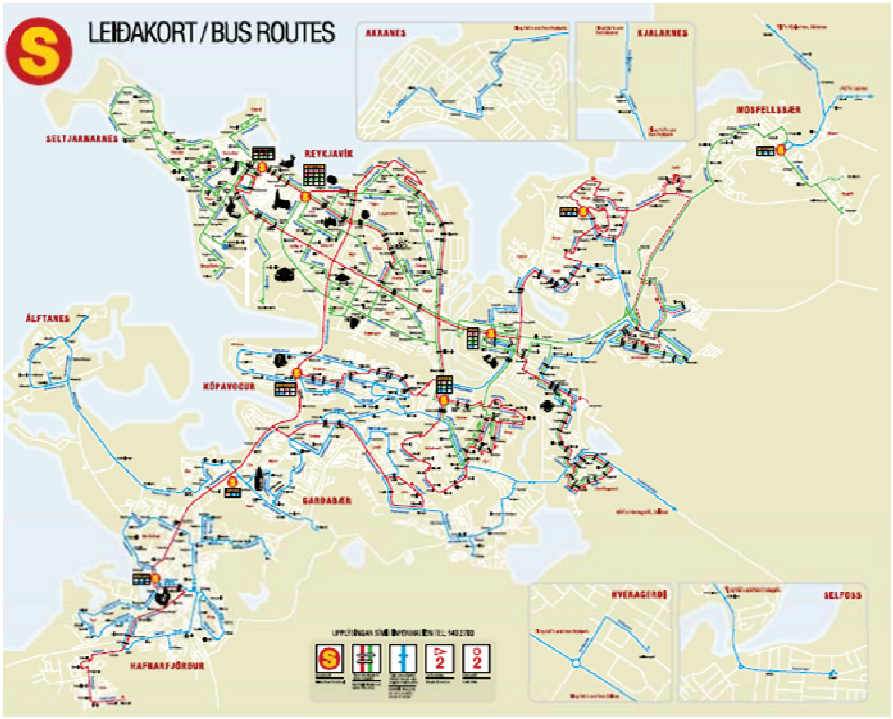


Figure 3-36: Bus routes in the Great Capital Area (Leiðarkort, n.d)

The bus routes are 26 and they are divided into three categories, i.e. red-, green- and blue routes (see Figure 3-36). The red routes are 6 and they are the so called "trunk routes", routes that use the main traffic arteries of the city. The red routes are thus the fastest routes available and their main purpose is to get people around between the largest residential areas and work. The green routes are 8 and they are the "general routes" that go deeper into the different neighborhoods on slower streets. The main purpose of the green routes is to link large and heavily populated neighborhoods to the red routes. The blue routes are 12 and they are called "neighborhood routes" as they run within or between the suburbs and do not stop in downtown Reykjavik. Their main purpose is to link the suburbs to the red- and green routes. (Notkunarleiðbeiningar, n.d.)

During rush hours, most buses run at about 15-30 minute intervals and they are operated from 9 terminals spread across the whole Great Capital Area. (Notkunarleiðbeiningar, n.d.) In 2010 Straeto bs transported about 8 million passengers and that number has increased in 2011 and is estimated to reach well beyond 9 million passengers. (Farþegum Strætó fjölgar um 16,5% , 2011) Hopefully this is a sign of change of the travel pattern and that people is started to have more confidence into the bus system. In the early Sixties bus passengers in the Reykjavik area was about 20 million every year. Now as said they are about 9 million in the whole Capital area and if we take as well into account that the number of inhabitants has grown than we can fairly say that the passenger's number today is only about 25% of that it was in the early Sixties. (Helgason, 2004) As can be seen from Chart 3-7 then there is only about 4% of the inhabitants that choose to use the bus system so there is still a long way to go and it is clear that something has gone terribly wrong in the urban development considering those matters.

In 2005 a new, updated, bus system was launched in The Great Capital Area with the aim of double the passenger number (one can doubt if that goal (8%) is sublime enough). (Sigurðsson Á. Þ., n.d.) Many changes were made and routes systems were altered to what was described earlier (se Figure 3-36). The main features of the new system were that now there should be tried to maintain only 10

minutes intervals between the buses on the red routes. This has Straeto bs though not be able to maintain as delays on the main traffic routes are still too long even though trials with special lanes for buses and high priorities on traffic lights has been made. Those trials are still in rather small scales and thus they have not had the great influence on the frequency of the whole bus system. (Sérakgreinar Strætisvagna á Höfuðborgarsvæðinu, 2010)

Till 2005 the whole bus fleet was rather outdated. Since then Straeto bs have tried to modernize their vehicles as well as the waiting shelters and service provided. This have be done with the aim to lure more passengers and make the trip more convenient for customers. There has been used resources known from abroad like offer free newspapers and internet access on board and by now most waiting shelters had gotten a name that the bus intercom gives a voice message when approaching. As the waiting time for a bus in Iceland can be quite long and a harsh weather conditions can make the wait even longer there has been made some trials projects for heated waiting shelters. In addition some trial projects, like offering bus transport from large parking spaces near the center of Reykjavík have been made as well as offering free transport for students. Concerning environmental matters then Straeto bs has an ongoing experimental project where some of the buses runs by hydrogen and methane, more ecological power sources then oil.

Today, one pays in general 350 kr (2,82 USD) for one fare and it does not matter where inside the system you are going. When stepping aboard you can ask for ticket that allows you to use the whole bus system for about 75 minutes. You can only pay with cash but payment with credit cards will be installed soon. For those who want to combine bicycling and bus fares can do so as you can take the bicycle inside the bus (if there is enough space). (Strætó er líka valkostur, 2011)

Figure 3-37: Facilities for bicycles inside busses and at the main terminals (Mjoddin) are limited. T.L. (Randversson, 2009), T.R. (Hjaltested, 2011)

At the waiting shelters and the main terminals are almost no facilities for bikes or cars (see Figure 3-37 and Figure 3-38) so a system of "bike and ride" or "park and ride" is not to be found in Reykjavik as is in many cities, e.g. Copenhagen. As for now, travels by bus in Reykjavik is not as easy or less time consuming then travels in private car. There is though much to gain in expenses but the latter theories in this field has shown that there is an underlying more complex correlation between land use, travel pattern and the making of transportation networks. A correlation that is based on that traveler chose its transportation means not solely from economics values. (Sigurðsson H. , Um ferðamáta á höfuðborgarsvæðinu, 2004)

Figure 3-38: The facilities for parking bicycles at the waiting shelters are limited (Hjaltested, 2011)

3.2.4.3.7 Bicycling and walking

In Reykjavik's transportation policy (Samgöngustefna Reykjavíkur) there is put emphasis on reinforcing the ecological ways of travelling, bicycling and walking. (Samgöngustefna Reykjavikur, 2006) This has not always been the case as described earlier. The city path system seems to have been designed to fit the transportation network and not the other way around. This path system of Reykjavik has been and is still used and design for both bicycling and walking and a separate path system is not installed. Some trials have been made to separate the two path systems but they are in rather small scales.

> *"In 2005 the city's first bike path was implemented and a year later another short path was opened where car parking spaces had been removed, much to the areas car owners disliking. Since then not much has been done. Not until the summer of 2008 where three streets got marked with "bike and chevron" markings. This is a new approach by the city of Reykjavik where simpler, less costly measures are to be used to make the city more bicycle-friendly."* (Randversson, 2009)

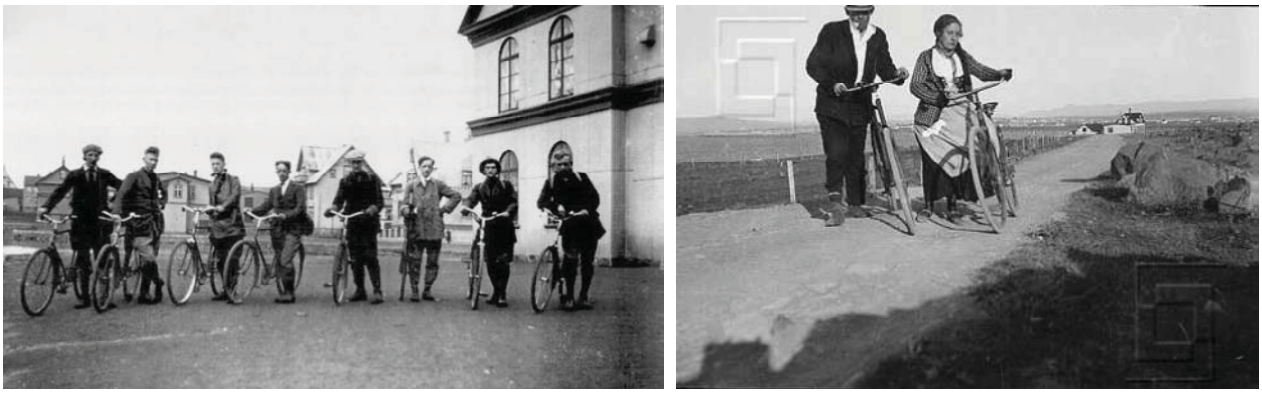


Figure 3-39: In the old days bicycling was one of the main ways to travel (Randversson, 2009)

Focusing on bicycling, city wide is and has been a natural part of development of transportation networks in many cities around the world. Many cities has had this focus for a long period of time, others have just recently started to consider bicycling as one element in the modal split. Reykjavik is one of those latter once, where it seems that bicycling as a form of transportation mean has been forgotten through the periods of time. The first half of the last Century, bicycles were considered as one of the preferred modes of transport parallel to horses and cars in Reykjavik. There was a room for this mode in the transport network along with the others, a room that appears to be forgotten or lost in latter progress. It can be stated that until the turn of the century, bicycling has not been considered as one of the transportation modes in Reykjavik. In transportation designs this mode has simply been left out of the picture. (Hjólaborgin Reykjavík, 2010)

In the 21st century the conditions for bicycling have been improved in Reykjavik. More focus has been on this mode through new trends in urban development i.e. sustainability and Reykjavik is leading when it comes down to those matters in Iceland. A new network of combined bicycles lanes and walkways have risen around the city (started in the Eighties), a network that glides in some neighborhoods well through the localities and is hardly developed at all in others. This system combines, and creates shortcuts between recreational- and green areas of the city as well as providing a pathway along the seaside and the main arteries of the city. (Hjólaborgin Reykjavík, 2010)

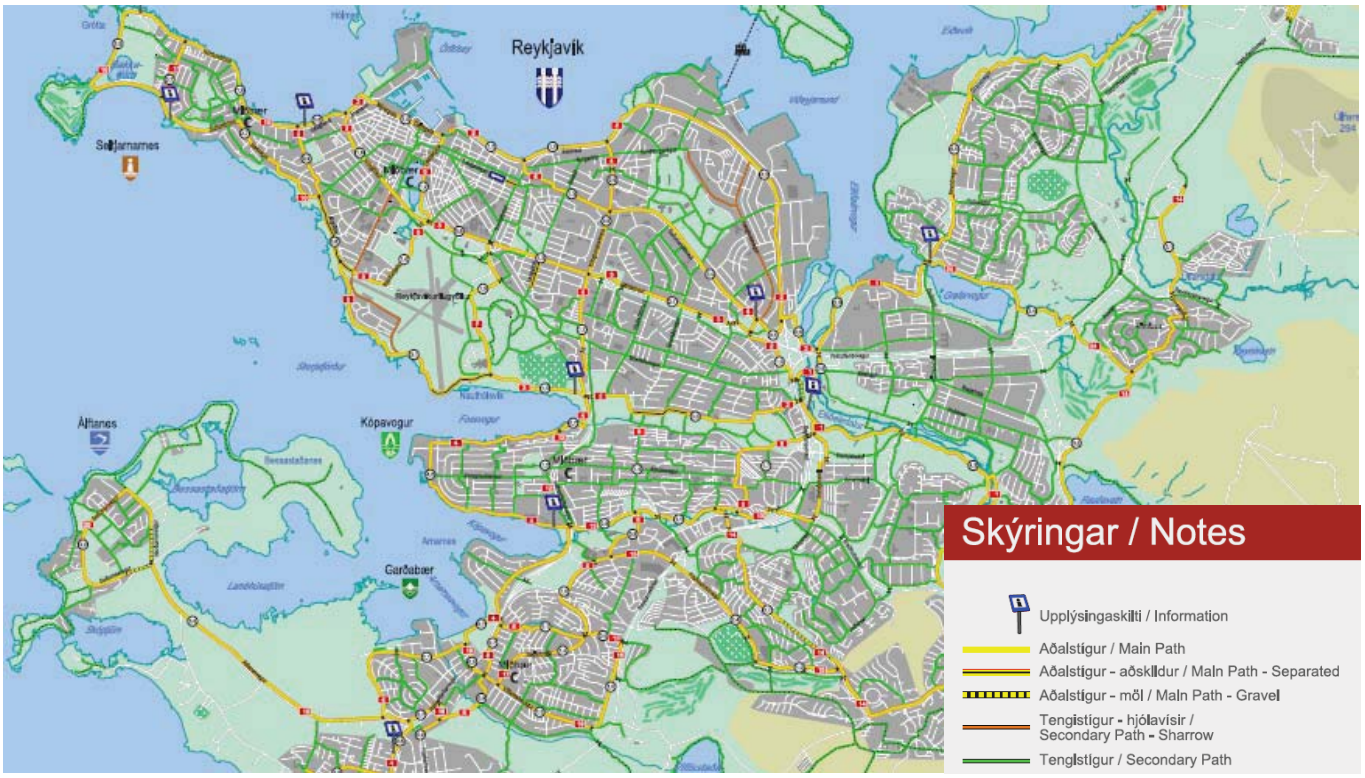


Figure 3-40: Existing map for walking and bicycling in The Great Capital Area (Great Capital Area map, n.d.)

3.2.4.3.8 Travel pattern vs. health issues

As for now bicycling in Reykjavik has mostly been regarded for recreational purposes. The city authorities seem to have overlooked this great mean of transport in its urban development that has resulted in that today bicycling is not considered as a realistic way to get around on daily bases. In general one can say that the attitude towards bicycling (and public transport as well) is basically negative. There are many factors that shape those opinions but the loudest factors, apart from bad facilities, are probably the extreme weather conditions and the changing altitude of the country. Designers have to face numerous challenges when designing pathways whether it is for walking or bicycling. In Iceland maybe the hardest challenge is to design those pathways so the users are protected from the elements and have visibility and lighting that gives them a sense of safety. The elevation in the landscape can as well vary a lot and it is vital to make the journey as pleasant and effortless as possible. When analyzing this path system of Reykjavik that started to be built in the Eighties one could say that those challenges has been faced in some ways but as said this path system is designed strictly for recreational purposes. This system does not aim at making distances as short as possible for bicyclers and does thus not actuate bicycling as one of the modes of

transportation. The path system provided for bicycling in Reykjavik has not, as it is now, changed the travel pattern and the public behavior towards bicycling in the city. (Randversson, 2009)

This can be seen in Chart 3-7 and here below. Chart 3-14 shows that only about 3% of the inhabitants of Reykjavik does travel to work or school on bicycles and only about 6% of the children attend school by that mean of transportation. (Umhverfis- og samgöngusvið Reykjavíkurborgar, 2009)

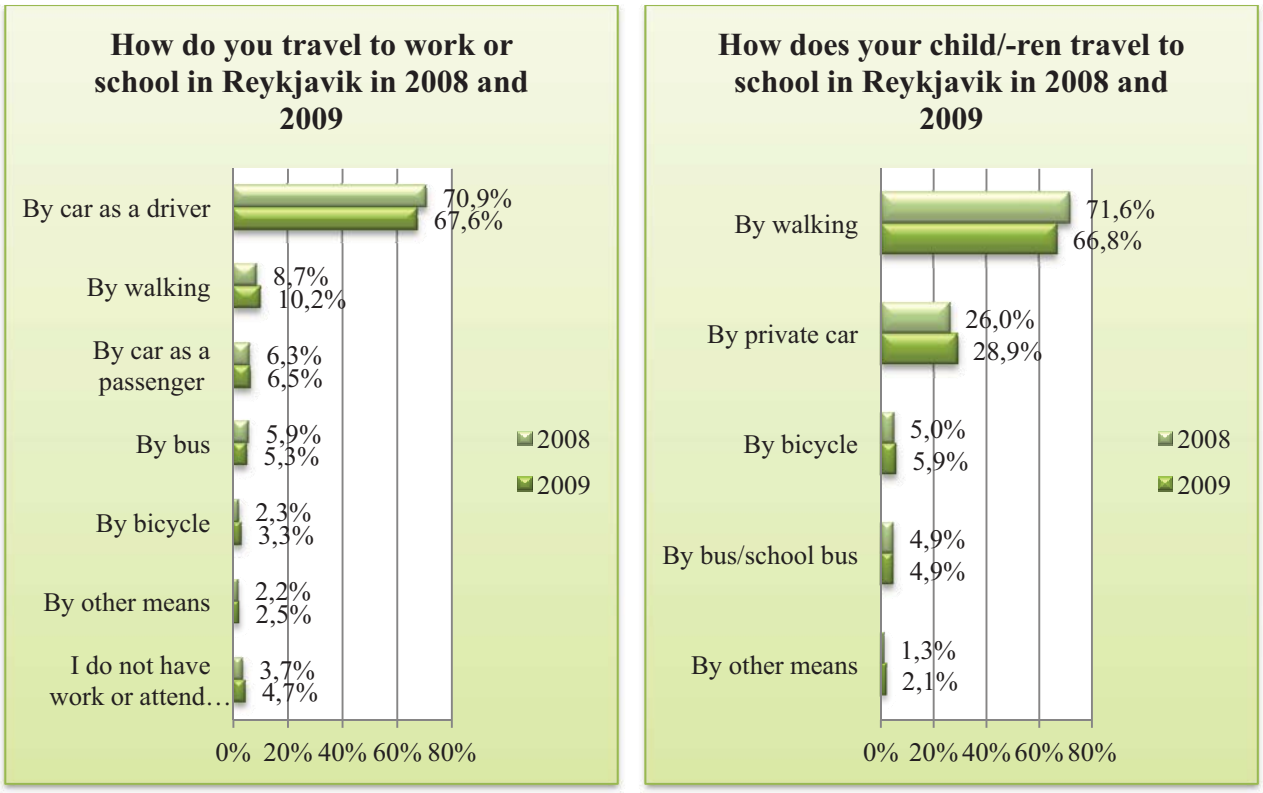


Chart 3-14: Reykjavik in general, how do you travel to work or school (T.L.), how did your child travel to school (T.R.) (Umhverfis- og samgöngusvið Reykjavíkurborgar, 2009)

Chart 3-7, Chart 3-8 and Chart 3-14 does all show well what is happening in The Great Capital Area as well as Reykjavik municipality today. People are chosen the car as its favorites mean of transport, though they try to teach their children not to do so (partly). The inhabitants are developing bad habits about daily motioning and they are getting more and more addicted to their cars. The result is more physically unfit inhabitants in a city were life between the buildings is slowly fading out. As for now the Icelandic nation is in ninth place over the nations that have most obese and overweight problems in the world, about 60% of the nation has overweight problems. Iceland's statistics in these matters are worse than most countries in the world and way beyond the other Scandinavian countries (see Chart 3-15).

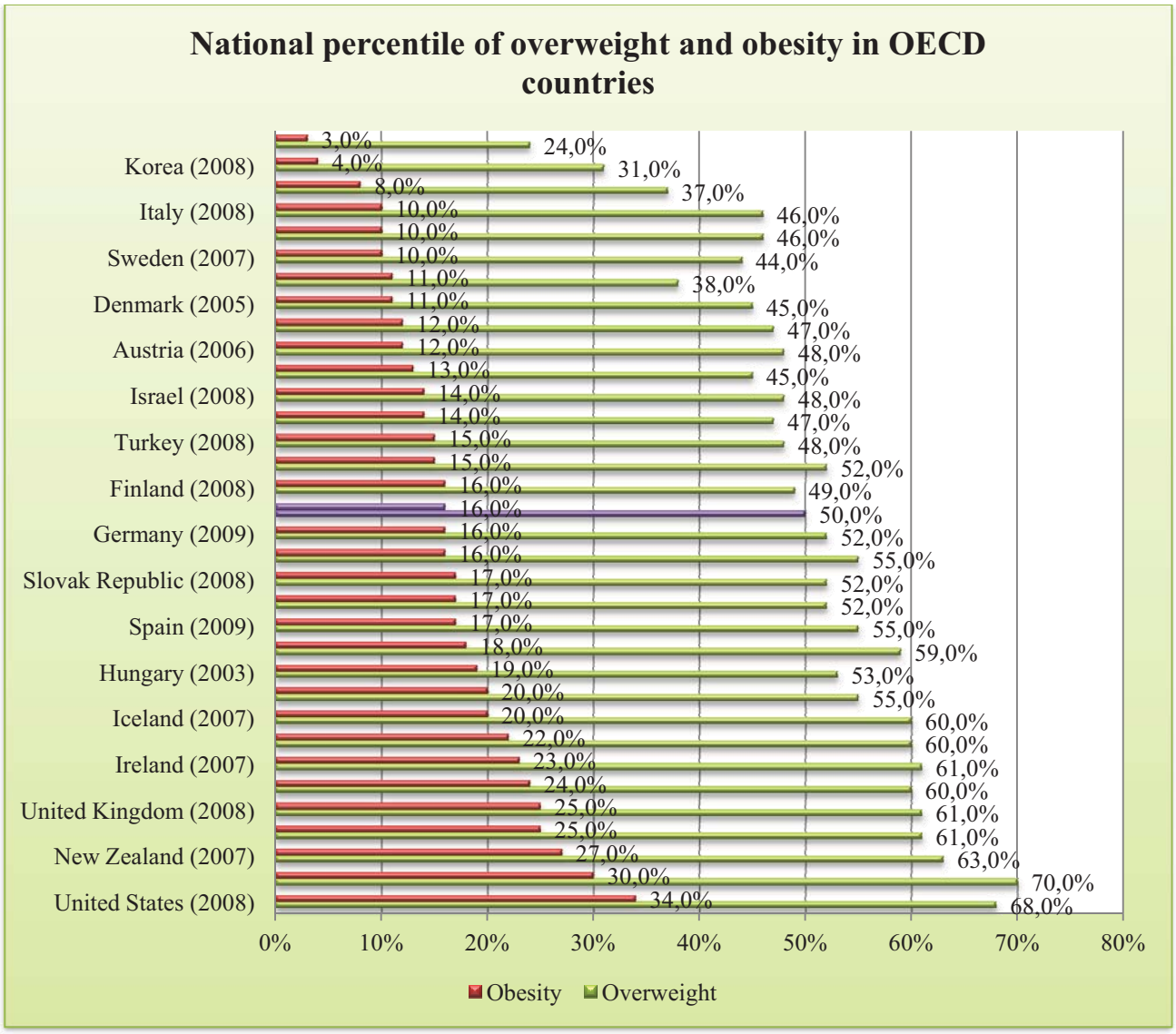


Chart 3-15: Rates of obesity and overweight persons by country 2010 (World Obesity Stats – 2010 and Beyond, 2010)

3.2.4.4 Reykjavik's built environment

Figure 3-41: Overview over Reykjavik's City Center, with the City Hall at the end of the pond Tjornin (Samgöngustefna Reykjavikur, 2006)

Reykjavik's built environment is and has been under an influence from many urban development trends and -practice. As such there is to be found in Reykjavik many types of buildings and whole neighborhoods take the appearance of that current time urban development practice. The built environment has in many cases had hard time following this vast development and has repeatedly rushed through its fringe.

The municipality is clearly divided in its structure where industry areas define the north shore of the peninsula, financial and administration characterize the old city center and the heart of the peninsula meanwhile residential areas interweave and grow out of the peninsula.

In the following there will be looked at some of the characteristics that Reykjavik's built environment has and there will be tried to give clearer image of its shape.

3.2.4.4.1 Population density

Iceland is among the ten least populated countries in the world, with a population density of 3 persons/km^2. (population and population density in the world, n.d.) The size of The Great Capital Area is approximate 1,062 km^2. The amount of inhabitants is about 202,370 persons so the population density of the area is approximate, 191 persons/km^2 (see Chart 3-16). Reykjavik's Large Urban Zone (LUZ), i.e. The Great Capital Area is thus not as densely populated as many of the capitals of the Nordic countries. Reykjavik's LUZ area can be placed in a category with some of the smaller towns and cities of the north (that in many cases are known for their stray built-up) and does not stand comparison to the cities of United Kingdom, Germany or cities farther south in the continent. The Great Capital Area profile fits well with many American cities like Alabama and Houston as seen below (In Chart 3-16 and Chart 3-17, there was aimed at using the same definition for Reykjavik municipality and The Great Capital Area as in the data of the city profiles from Urban Audit collection and Census). (City Profiles, n.d.)

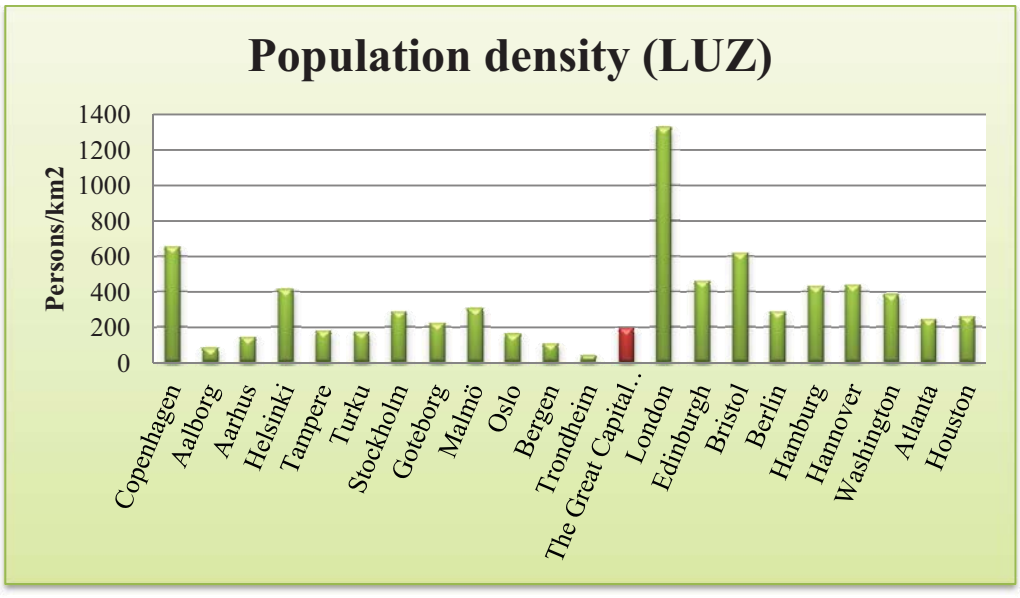


Chart 3-16: Comparison of density in some European cities larger urban zones (LUZ) (see Appendix 4: Density statistics)

As the history has shown than has Reykjavik's growth been enormous in a matter of 60 years (see paragraph 3.2.3). The municipality does cover a land of roughly 273 km^2 and the inhabitants are just under 119,000. That means when taken into consideration the whole municipality the population density is about 436 persons/km^2. Reykjavik municipality is though not fully populated

as can been seen in Figure 3-42. The main populated area of the municipality is only about 60 km^2 and is defined by the green areas of the east (see paragraph 3.2.4.4.6), the coastline to west as well as municipality boarders to south and north. In current master plan, this 60 km^2 of a land is the area that shall be focused on in the future urban development of Reykjavik. The aim is to densify this already populated area of the municipality and link the suburbs together. (Hagkvæm nýting lands, n.d.) As for now at least 99 % of Reykjavik's municipality population live inside this area and that gives that the density of the area is about 1,872 persons/km^2.

Figure 3-42: The main populated area of Reykjavik municipality, marked with dark gray (Hagkvæm nýting lands, n.d.)

If only this part, the main populated area of the municipality is taken to consideration than the comparison to other cities changes a little bit. This comparison gives a better comparison as now the main populated areas of the cities are compared. Now the core area, where the mass is located is compared, a comparison that could indicate cities sustainability level. Chart 3-17 shows that the mass of the population is more related to the centers of the cities (CITY area) in e.g. Copenhagen, Stockholm and Berlin but in e.g. London it seems to be more dispersed in larger area (compared to amount of inhabitants and space needed, both Chart 3-16 and Chart 3-17 gives only a comparison, it is not certain that all data are gotten by the same premise). Cities like Atlanta and Houston are known for having one of the smallest population densities in America. (Cities and Counties, 2011)

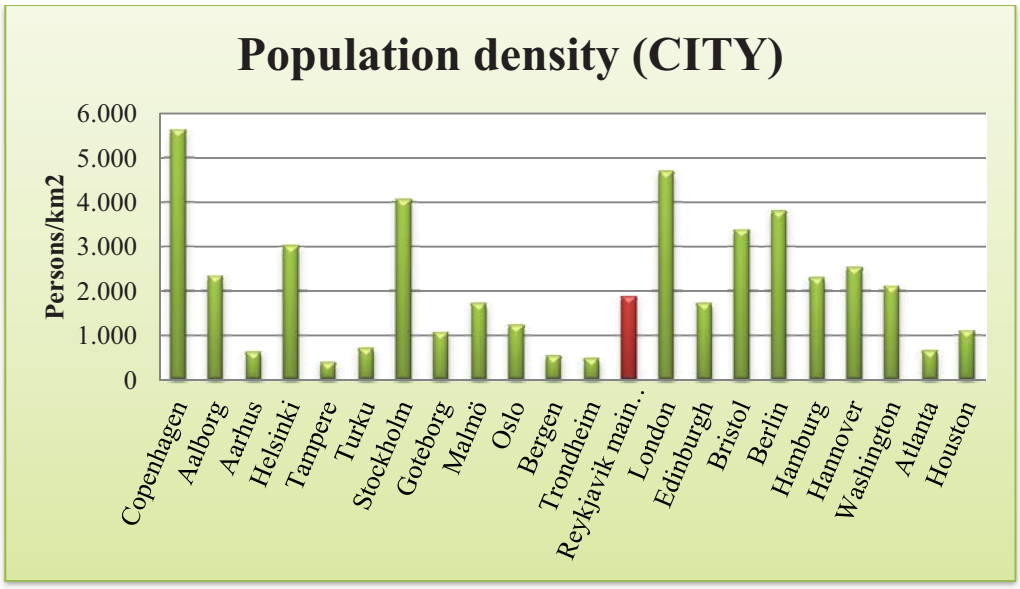


Chart 3-17: Comparison of density in some European cities main populated areas (CITY) (see Appendix 4: Density statistics)

When looked at this 60 km^2 built area of Reykjavik municipality it is obvious that it has not the same character everywhere. This area can be divided roughly in 2 zones, one that is located on the west side of the Ellidaardalur valley i.e. Reykjavik I and the other, Reykjavik II, that is located on the east side. It is obvious that Reykjavik I is the one that is more mature in nature where the built area is older and the population density is larger. The density fates out to Reykjavik II were the built areas starts to take shape of more suburbs with its more rural areas.

Figure 3-43: Sharply division of Reykjavik municipality in two types of areas (Google Maps, 2012)

In the years from 2001 to 2009 there were finished or taken in use about 4,878 apartments in both Reykjavik I and II. In this period there were built 1,112 apartments in Reykjavik I meanwhile in Reykjavik II there were built 3,766. Of those 4,878 apartments there are about 2,085 apartments (43% of the total) that are built in already built areas i.e. apartments that make the built environment denser. If one recon that all of the 1,112 apartments built in Reykjavik I are too dense the built environment, one can assume that only about 973 were built in Reykjavik II with the same purpose

or only about 25%. The rest of the apartments that was built was then to further maintain the urban sprawl or to try to link the suburb together (see Chart 3-18). (Þórarinsson, 2010)

The main areas that are to be rebuilt at this development period i.e. 2001 – 2024 according to The Master Plan of Reykjavik are marked with orange dots in Figure 3-43.These dots mark old industry and underutilized areas where 50 or more apartments are or will be built at this development period. The aim is to increase Reykjavik's density by utilizing these brown fields of the municipality. (Greinargerð I, 2008)

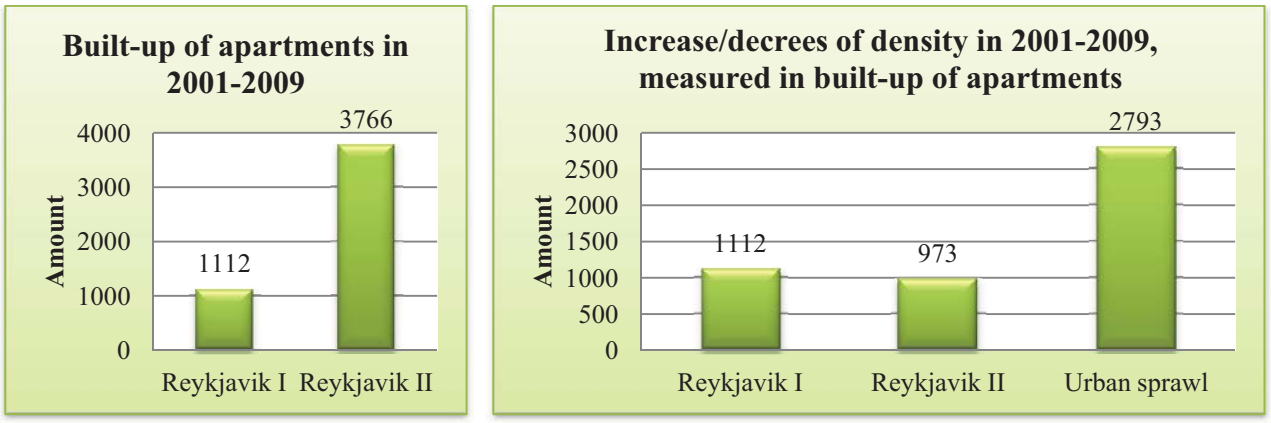


Chart 3-18: The built-up of new apartments in 2001-2009 (T.L.) and comparison of built-up in already built areas or in new areas (T.R) (see Appendix 4: Density statistics)

3.2.4.4.2 Center of residence

In 2010 the population of Iceland was 318,236 persons. In the Great Capital Area there were about 202,370 persons (63,7 % of Icelandic population) and in Reykjavik municipality there were 118,908 persons (37,4 % of Icelandic population) over half of the population of the Great Capital area. [Appendix 2: Iceland in numbers]

If looked at the center of residence for Reykjavik municipality and the Great Capital Area than as can been seen in Figure 3-44 the both centers lay inside the area of Reykjavik I.

Figure 3-44: Center of residence in 2010 [(Google Maps, 2012) and (Miðja Búsetu, n.d.)]

The center of residence for the Great Capital Area lies near the municipality boarders between Reykjavik and Kopavogur and are moving in south-east direction as can been seen in Figure 3-45. The figure also shows that the center of residence in Reykjavik municipality have almost stagnated from 2008 but has moved slightly in as well south-east direction from 2006.

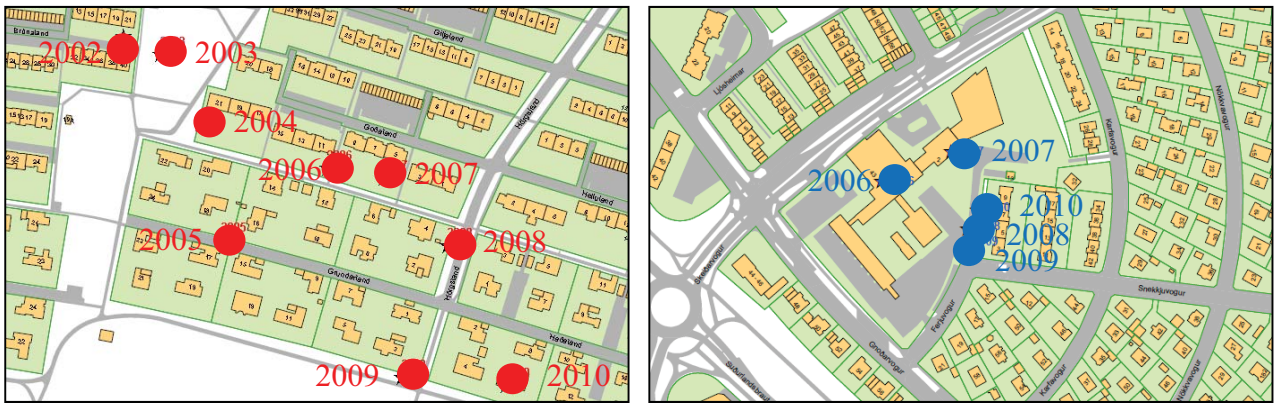


Figure 3-45: Movement of center of residence in both the Great Capital Area (red) and Reykjavik municipality (blue) (Miðja Búsetu, n.d.)

3.2.4.4.3 Center of occupation

In current Regional plan of the Great Capital Area there are defined three types of centers for the whole area, i.e. Center of National Interest, Center of Regional Interest and Center of Municipality and Neighborhood Interest. (Stefánsdóttir & Haraldsdóttir, 2010)

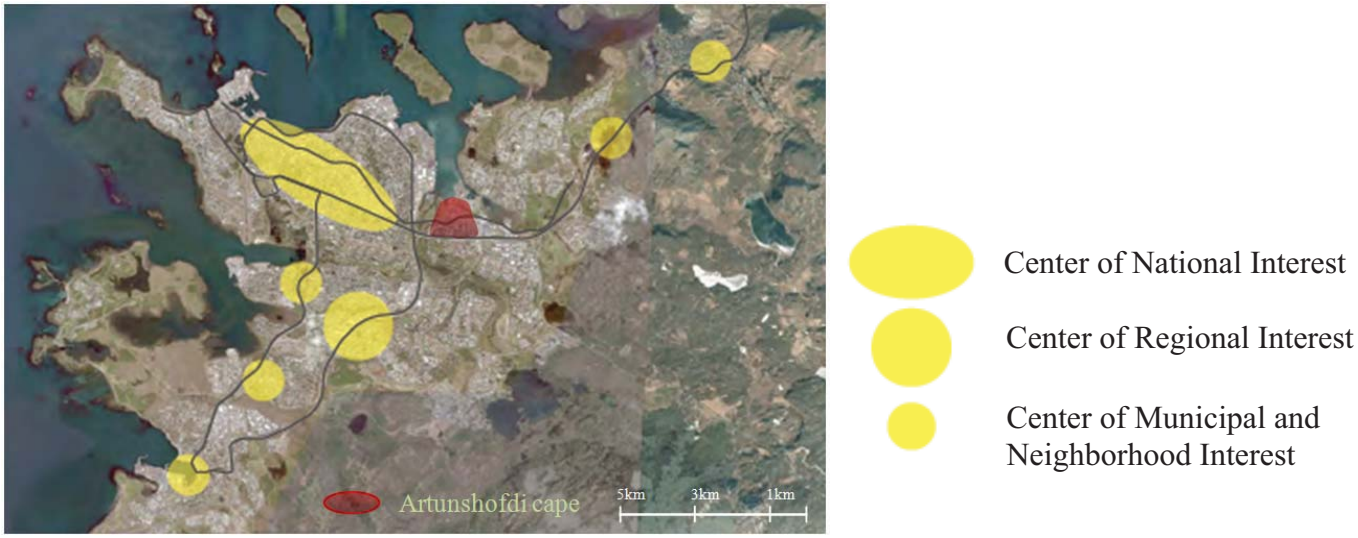


Figure 3-46: The various centers of occupation in the Great Capital Area (Stefánsdóttir & Haraldsdóttir, 2010)

Center of National Interest: A center of service, administration and business that serves the Great Capital Area as well as the country as a whole.

Center of Regional Interest: A center for service and business that serves the Great Capital Are, especially the center surroundings.

Center of Municipality and Neighborhood Interest: A center for service for each municipality as well it's near surroundings.

The strongest and most vital center of those all is the Center of National Interest. This one beholds the main administration, service and business district of the Great Capital Area. It is directly linked to the old city center of Reykjavik and has more of an appearance as can been seen in Figure 3-47.

Figure 3-47: Center of National Interest marked with yellow (Samgönguskipulag í Reykjavík, 2006)

In 2005 there were about 100 thousand jobs in the Great Capital Area and thereof were about 80 thousand of them in Reykjavik municipality. At this time there was estimated that in the Center of National Interest were about 40 thousand jobs. This means that about 40% of all jobs in the Great Capital Area are in this center zone and about 50% of all jobs of the Reykjavik municipality. (Samgönguskipulag í Reykjavík, 2006)

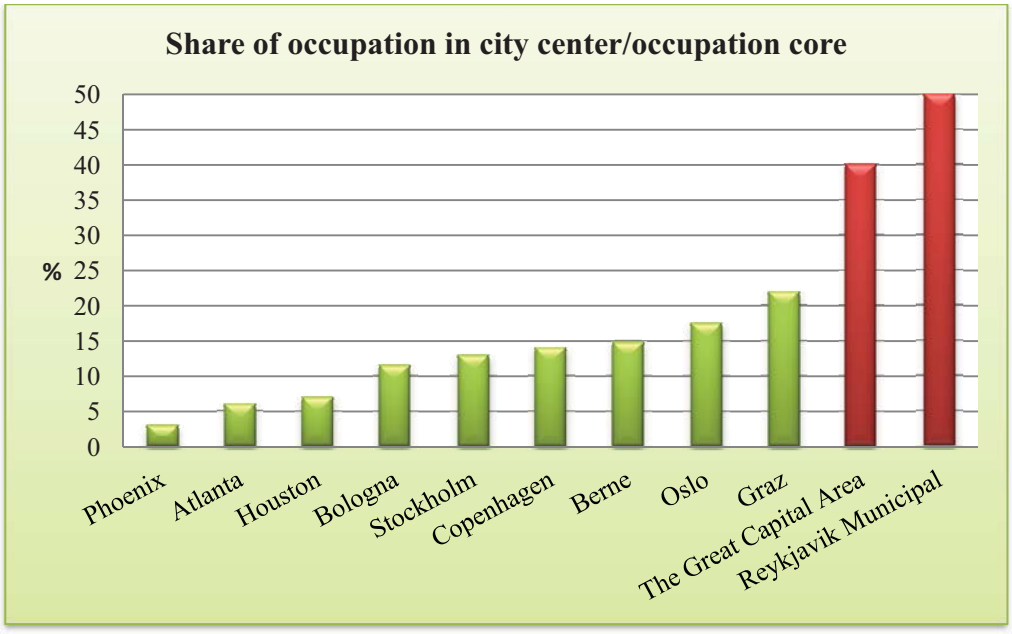


Chart 3-19: Share of occupation in city center-comparison to other cities (Samgönguskipulag í Reykjavík, 2006)

Though these numbers are rather outdated, i.e. they are from 2005 there is estimated that the percentage has not changed a lot as there was in 2010, 111 thousand jobs in the Great Capital Area (see Appendix 4: Density statistics) and the recent urban development have brought more jobs to the Center of National Interest area. These are e.g. build-up of Harpan concert and conference centre and office buildings in Skulagata Street and Borgartún area, (see Figure 3-48). This recent

development is estimated to rather increase the percentage of jobs in the Center of National Interest and that alone would not help Reykjavik in national comparison as in 2005 its status was as seen below.

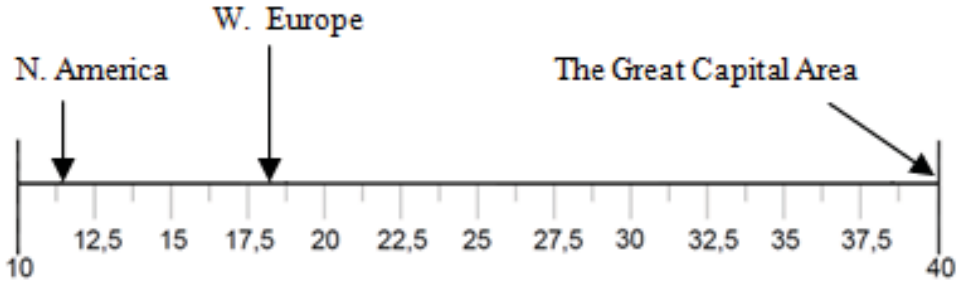


Chart 3-20: Share of occupation in city center-comparison to average numbers (Samgönguskipulag í Reykjavík, 2006)

3.2.4.4.4 Share of transport

Land and space to be utilized in cities is a limited resource and with increasing growth of the urban society of the Great Capital Area the value of available and unutilized land is getting more and more expensive. This is especially the case in Reykjavik municipality as the value of the central areas is increasingly rising. Parallel to this development the demand for better quality of the urban environment is increasing. Now the life between the buildings is valued more than ever and the sustainable principles are demanding more compact urban environment with less emphasis on transportation systems. To put it more precise the demands for lowering the share of transportation inside the city boarders to gain better urban atmosphere and more efficient utilization of the urban land are getting louder.

Though there is to be found various materials concerning the influence that the car and its associated network have had on the urban development of Reykjavik, there is not much to be found concerning how much land the transportation system actually cover. There is in many cases said that in car orientated cities like in America the transportation system and associated spaces needed is about 50% of the built environment and even higher. Reykjavik can be categorized with those cases as can been seen in Chart 3-21. (Landþörf samgangna, 2004)

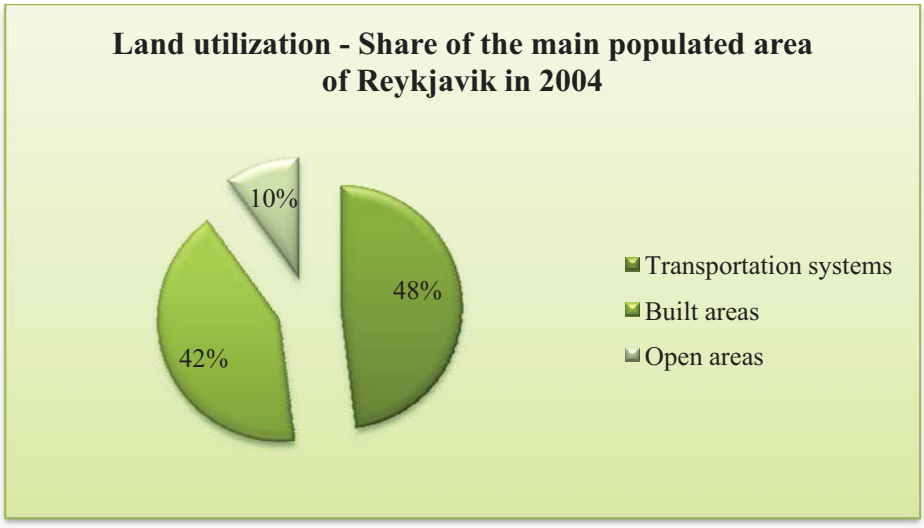


Chart 3-21: Land utilization of transportation systems in Reykjavik municipality (Landþörf samgangna, 2004)

The fact that Reykjavik's transportation network covers 48% of the main populated area (see the main populated area in Figure 3-42) does not come as a surprise. This share does cover Reykjavik's road network and associated areas that are linked to the roads (all the "green" areas between roads and the areas linked to roads because of sound protections and pedestrian safety), all parking spaces, walking paths as well as tracks. In many cases the number given for the share of transport for cities only includes the share of road network, i.e. the network built for the car. To have the right comparison to those cases one has to subtract the walking paths and tracks and by doing so one would get the share of transportation as being 42% instead of 48%. (Landþörf samgangna, 2004)

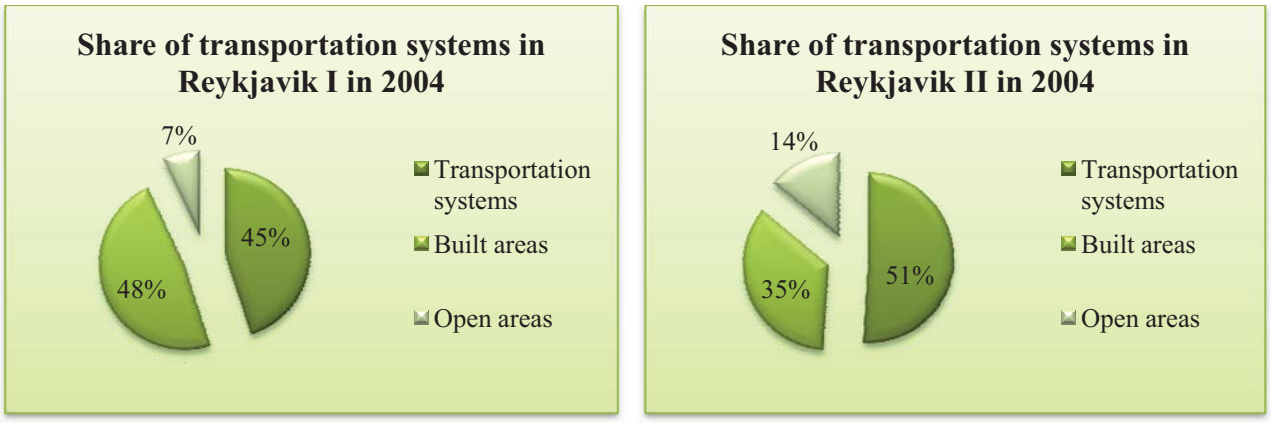


Chart 3-22: The share of transport in respectively Reykjavik I (T.L) and Reykjavik II (T.R) (Landþörf samgangna, 2004)

To put this in a context with density one can use the already made division of Reykjavik in two zones, i.e. Reykjavik I and Reykjavik II (see Figure 3-43). By Chart 3-22 one can see that the land usage under transportation systems are relative larger in Reykjavik II, i.e. on the east side of the Ellidaardalur valley. Reykjavik II is an area that has been constructed in more car oriented period then Reykjavik I, i.e. the area on the west side of the Ellidaardalur valley. In addition one could say that the areal taken under transportation systems for each resident in Reykjavik II is 35% more than for residents in Reykjavik I and the areal taken under transportation systems on each built square meter is almost double in Reykjavik II as for Reykjavik I (see Table 3-5). This again shows that the area on the west side of the Ellidaardalur valley, Reykjavik I is denser than the area on the east side, Reykjavik II. This also shows that the Reykjavik municipality gets more out of its transportation network in Reykjavik I than in Reykjavik II. (Landþörf samgangna, 2004)

Land usage of the main populated area of Reykjavik municipality*				
	Reykjavik I		**Reykjavik II**	
	Areal (m^2)	ratio(%)	Areal (m^2)	ratio(%)
The share of transportation system	7.364.715	45,4	7.824.157	51,1
The share of residential areas	7.754.163	47,8	5.377.727	35,2
The share of green areas/open areas	1.109.562	6,8	2.095.845	13,7
The amount of transportation system on each resident	123		166	
The amount of transportation system on populated area	1,2		2,3	

* The share of the largest outdoor recreational areas between neighborhoods and city districts as well at the fringes are left out as well as the coastline and the airport area of Vatnsmyri moor though some of them categorizes as being a part of the transportation network

Table 3-5: Land usage of the transportation network in Reykjavik municipality (Landþörf samgangna, 2004)

These numbers emphasizes thus how a city can better utilize its transportation system by having a denser built environment and this shows the correlation between urban density and utilization of the transportation network. This correlation can though be affected be planners as a "bad" urban design can easily corrupt this correlation (extensive transportation network on each resident/accommodation, despite high density) meanwhile a "good" urban design can encourage it (minimum transportation network on each resident/accommodation, despite low density). This is the case in Reykjavik as in most cities, there is a certain variation between neighborhoods, a variation that seem to follow the urban practice at each time. (Landþörf samgangna, 2004)

3.2.4.4.5 Fringe belts

When a city grows and expands in such a rate like Reykjavik has, it is inevitable that some areas functions are not as convenient today as they were in their buildup period. Today many of these areas in Reykjavik are embraced by an urban area though their original location was aimed at being in the outskirts of the city. These kinds of areas are called Urban Fringe Belts or just fringe belts. This term was first applied by a geographer called Herbert Louis in 1936 as a Stadtrandzone meaning Urban Fringe Belts. In old fringe belts one can e.g. find areas with facilities that are space consuming and activities that no longer are suited for being in a city. In these areas, in many cases, there are e.g. small and large industries, car dealers and workshop, warehouses, garbage yards, vegetated areas, stables etc. (Whitehand & Morton, 2004) In Reykjavik these areas are mainly to be found around the city center, in the Vatnsmýri moor, in Artunshofdi cape and the old garbage yard in the Gufunes area. These areas belong to different timezones of Reykjaviks urban development and are e.g.: Industry areas like the Orfirisey "island", some of the harbor activites along the north shore of the peninsula, Hringrás a recycle company for metal and car parts as well as Bjorgun a minerals company and asphalt- and concrete companies in the Artunshofdi cape area (see paragraph 0). Service and business areas around the Myrargata street, Skulagata street, Borgartun area, Sudurlandsbraut street, Landspitali sjukrahus hospital and Skeifan business and shop area. Green areas of the city, areas like Ellidaardalur valley, Klambratún park, Laugardalur park, Oskjuhlid hill, Videy island and Heidmork area (see Figure 3-48). It is in the nature of urban fringe belts to become more and more valuable, along how deep they grow inside the city. Some of those areas have grown to become "brown fields", like the old harbor activities of the city center meanwhile others, like the green areas and historical grounds have preservation value and are thus in a battle of not giving in to the pressure of the urban development.

Figure 3-48: Specific areas that shall have focus on in the future development of Reykjavik municipality (Nokia maps, 2012)

The main rebuilding and reconstruction areas in the 21st century in Reykjavik municipality have been in the city center around Myrargata, Skulagata and Sudurlandsbraut streets as well as in the Borgartun area. These areas are all located in the Center of National Interest as is showed in Figure 3-47. Some areas like Skeifan business and shop area and Artunshofdi are waiting for their time to be redesigned meanwhile other has gotten some restoration like the garbage yard in Gufunes area and the Orfirisey "island". Some areas are though heavily debatable among residents and politicians and their re-utilization is thus associated with great uncertainties. These areas are areas like Vatnsmyri moor and Landspitali sjukrahus hospital.

3.2.4.4.6 Green areas

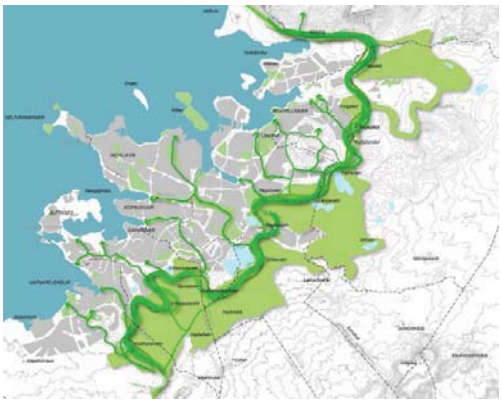


Figure 3-49: The Green Scarf of the Great Capital Area (Grænn stígur í græna treflinum, 2009)

A belt or a scarf of green areas is to be found in the outskirts of the Great Capital Area. These forestry and an outdoor recreational areas are called The Green Scarf. This "scarf" marks the boarder of the built environment and sets a boundary for the futuristic urban sprawl of the 8

municipalities involved. The "scarf" is thus linked to current Regional Plan and the goal is to link all the forestry and outdoor recreational areas of the municipalities together and thus form and develop this "scarf". The scarf is rather large area that has and will have a multiple land use properties though strictly only for recreational purposes. Today there are some areas inside the boarders of the Green scarf that hosts activities that does not conceal with the scarf's main objectives of being strictly used for recreational purposes. In the future the Green Scarf shall strive towards being strictly for leisure and related outdoor activities in favor to all residents of the 8 municipalities. (Græni trefillinn, 2009)

As said the idea behind the Green Scarf's is to link all the forestry and outdoor recreational areas of the municipalities together and therefore, in between, there are many areas that have pore vegetation. The aim is to gradually grow these areas and close the gaps so that the Green Scarf's can embrace the built environment and provide more shelter from the elements of nature. The scarf's main function is to give the inhabitants vital green areas for their activities as well as serving as green lungs for the Great Capital area. These lungs of the Capital shall hinder importation of particulates from the heath in the east, take in particulates that rise from the Great Capital Area transportation system. These lungs will as well absorb carbon (C) that is a vital counterbalance to the city release of carbon dioxide (CO_2) and other Greenhouse Gasses and as well they will protect and maintain the quality of the ground water reservoir that is a large problem in many cities nowadays. The scarf's shall as well motivate the inhabitants to take up healthier lifestyle in form of more motion and as such it will improve the health of the residents. As such the scarf is to improve the urban environment as well as work for the Great Capital Area strives towards more sustainability. (Græni trefillinn, 2006)

Figure 3-50: Part of the main Green Web of Reykjavik municipality, Ellidaardalur valley (Grænn stígur í græna treflinum, 2009)

One of the side projects of the Green Scarf is what has been called the Green Path and the Green Web. The Green Path is a vision of a 50 km long path that will thread the main sweet spots and most interesting areas of the Green Scarf and give the residents better access to the scarf and the uplands. Through Green Gates the Green Scarf will be linked to the Green Webs of each municipality. The Green Webs are the main routes, preferably green routes of each municipality in the Great Capital Area and through these each municipality will get a gateway to the Green Scarf. The Green Gates will be a rest or a meeting point for the users with appropriate service, facilitates and information stations. (Grænn stígur í græna treflinum, 2009)

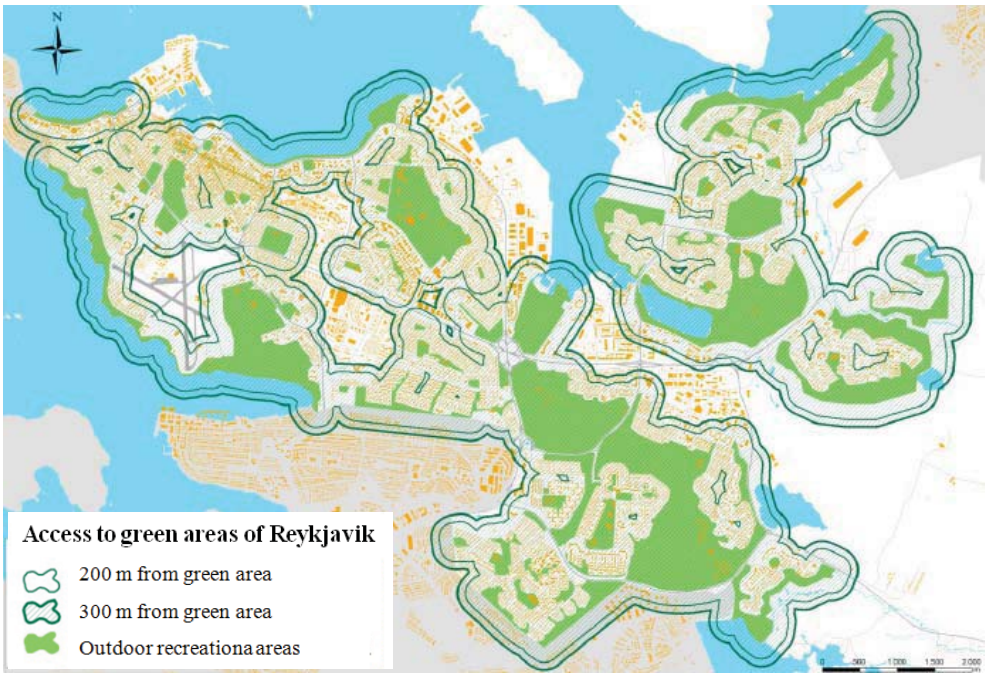


Figure 3-51: Green areas of Reykjavik municipality (Umhverfisvísar Reykjavíkurborgar, 2009)

About one third of the main populated area in Reykjavik municipality is organized as outdoor recreational areas. The access to these are relative good as for about 91,7% of the residents in Reykjavik in 2009 lived within 300 m from outdoor recreational areas. This means that within 5 minutes the residents were able to reach traditional green areas, squares, cemetery or open nature. In there is marked green area of the municipality that are larger than 2000 m^2.

3.2.4.5 The Urban planning actors

As explain in paragraph 3.1.3 then the City Government is to govern the capital, Reykjavik and see to that the regulations from the Icelandic State are followed through in each municipality (76 in total). The political landscape of the City Government has experienced political turmoil through the years that has not made this job trouble-free as explicated in paragraph 3.2.1, 3.2.2 and 3.2.3. At the turn of the century the Leftists party had been ruling the city from 1994 and before the election in 2002 they published a reviewed Master Plan for the period 2001-2024 in Reykjavik municipality, i.e. the current Master Plan of Reykjavik. The political turmoil started to grow again parallel with the economic boom of this century. The Leftist party lost their leading posture in the city in the election of 2006 to the Conservatives and by that a 10 year of Leftist power in the municipality ceased. The election period of 2006-2010 was characterized by much confusion as the Conservatives tried to settle down in their "new" posture. One could say that the Conservatives failed this job miserably, many changes were made in the leading posture and at the end of the election period there had been in total four City Majors. At the end of this election period and at the start of the economic crises in Iceland the public in Reykjavik had had enough. There were established new party called the Best Party, a party of the people, party that was placed central in the political landscape, party were the members has little or no experience in politics but had the common goal of raising against the confusion that has risen in the city government. This central party won the election in 2010 and started the restoration process that is still going on today.

If it is due to the economic crisis or the new leading party, the political turmoil and competition has ceased in the city as well as between municipalities. Some would say that today there is a form for

"status qua" state in Reykjavik. Now the restoration and growth of the city, in a sustainable way, is the primary goal, of the urban development of Reykjavik.

> *"This majority (Best Party) is thinking about increasing the economic growth of the city and such things but this majority is not thinking about votes in next election. I think that this development has been starting earlier, i.e. the prior majority in 2006…had great statements…that Reykjavik should put more emphasis on built-up, more lot allocation… that gives solid incomes into the city council founds, a model that could be realized but does not go so well with the principles of sustainability. All that was related to the economic boom in Iceland and in the world at this time, this majority (in 2006)…had though as well ideas about more sustainable and denser city as a guide light, it was then more its younger generations…this sustainable view is in fact not party related but more generation related, there is now upcoming new generation of politicians that all are in favor of this sustainable idea, to oppose to private car-ism and to gain more denser urban environment. This generation emerged in 2006 in all parties and in the following the voices of reducing urban growth in the outskirts and set the focus inwards got louder. This change of view that is related to this generation shift started before the crises, and with this "status qua" state there is a possibility to make even more ambitious aim concerning sustainability"* (Sigurðsson H. , Interview, 2011)

This century development towards more sustainability and the financial battle has definitely not come without a prize. The Icelandic Public sector was in 2005 the one in the world that was least corrupted. In 2007 the sector was number seven and now Iceland's public sector is in thirteenth place, lowest of the Scandinavian countries (Corruption Perceptions Index, 2011)

> *"The laws are such that we, the planners, shall work in favor of the interests of the general public, i.e. we shall have the general public interest as our leading point, we are always in the role of a compromisers, and that do we learn already at school. Our role is not to make the vision, it is up to the general public to mould the vision and then it is ours, the planners, to find the compromise of the build-up. The politics feel a pressure coming from private parties and listen to the residence and those that protest, the politics put pressure on the officials and planners and by that, maybe a solid foundation in urban development is gained. But it is not only the executive persons and the contractors that can have negative influence on the outcome in development matters, it is just as well the residents, this concept "not in my backyard", Nymbyism can have great influence. The politics can kneel down to matters where 90% of residents are in favor to a specific matter but few are against. By that the outcome isn't always a democratic one and certainly not always the most ideal on where general public interests have been considerate. The players/actors in this interplay, politics, private parties/contractors, residents and officials are facing complicated task where the outcome relies on officials that stand firm on their believes and are powerful/strong enough to be able to convince the politics to look at all viewpoints, but that had not happened to often!"* (Sigurðsson H. , Interview, 2011)

Today the general public and interested parties in Reykjavik is getting more to say about their own city. Their viewpoints are getting seen and their involvement is desirable in the current urban development. This changes in the urban planning procedure is evident in the new Master Plan of Reykjavik 2010-2030, that is too been seen the light of the day in 2012.

3.2.4.6 New Master Plan

A New Master Plan for Reykjavik municipality is to be published this winter, i.e. Master Plan 2010-2030. This Master Plan is a revision of current Master Plan 2001-2024 (see paragraph 3.2.3.1) and is to set the margins for future urban development of Reykjavik municipality.

The first steps of this revision work were taken already in 2006, i.e. that time majority collaboration in the city started this process. (Sigurðsson H. , Interview, 2011) This work has gradually changed during the years and one can say that the outcome is a Master Plan where sustainability and efficiency in the urban development, are in the seat of honor. The vision is to ensure growth of the municipality and its inhabitants in a sustainable way. The key principles are thus to: (Leiðarljós og áherslur, n.d.)

1. Strive towards more denser, varied and mixed use of the settlements where the human perception and its environment are respected and improved.
2. Ensure growth conditions for all sorts of economic life.
3. Create strong and lively city center.
4. Provide varied residential options for all social groups.
5. Make distances between residents and occupation shorter.
6. Strengthen the part of more ecological ways of transport, were walking and bicycling having priority and public transport gets more emphasis.
7. Maintain and protect historical heritage and outdoor recreational areas.
8. Increase the life quality of the residents.
9. Create unity about urban development matters.

The vision and the key principles will be formulated in four chapters in the New Master Plan, i.e. City for People, Creative City, Green City and The City by the Sound. (Borgarsýn, 2011)

City for People: City for People is to illustrate how the municipality is to get its aim of increasing the quality of life of the residence as well as how the quality of the human environment of the city is to be improved.

Creative City: Creative City is to illustrate how the municipality is to get its aim of strengthen the economic life of the city and how to support future innovation inside the municipality.

Green City: Green City is to illustrate how the municipality is to get its aim of efficient usage of land and natural resources as well of how to increase environmental quality, residential health, preservation of nature and how to increase the part of ecological transport.

The City by the Sounds: The City by the Sounds is to illustrate how the municipality is to gets its aim of increasing the westward growth of the city. How to increase the density of the peninsula and how to aim at building up for mixed usage.

Figure 3-52: The New Master Plan vision about densing the main populated area of the municipality (Sigurðsson H. , Nýtt aðalskipulag til ársins 2030, 2011)

The main changes from the Master Plan 2001-2024 to this one 2010-2030 is this increased emphasis on the quality of the Reykjavik's built area. The human perspectives or the life between the buildings are having higher priorities and by that the quality of life in the municipality is to gain new heights. This and increased density is seen now as the key element in attracting new businesses and residents and making the municipality more competitive in local and global contexts. (Borgarsýn, 2011) The Master Plan 2010-2030 does thus not encourage to more urban sprawl of the municipality and at least 70% if not 80% of the future built-up will occur inside the main populated area (see Figure 3-52). (Sigurðsson H. , Nýtt aðalskipulag til ársins 2030, 2011) The city will thus been made denser and in addition there will be tried to even out the placement of workplaces so distances from work and residence can be reduced. By this the aim is to ensure more variety in transportation and the usage of alternatives modes of transport. (Sigurðsson H. , Interview, 2011) In addition, public will be encourage to have more influence on the planning process and the urban development of the municipality. The aim of the Master Plan 2010-2030 is to have the residents of the municipality to take an active part in urban development matters. This has been done under the preparation work of the Master Plan and the aim is to increase this collaboration even further in the timeframe of the Master Plan. (Borgarsýn, 2011)

3.3 Artunshofdi cape

Figure 3-53: Artunshofdi cape (Hjaltested, 2011)

Figure 3-54: Location and overview (Já, 2012)

The area of Artunshofdi cape is of roughly 90 ha (0,9 km^2) and is located in Reykjavik municipality as can been seen here above. The area rise high in the landscape and far and wide there is a great view over the fjord area and at the root of the west side of the cape lays one of the best outdoor recreational areas of the city, Ellidaardalur valley. The Artunshofdi cape area can today be categorized as a fringe belt i.e. remains of a quarter that once was in the outskirts of the city but has now more central location (see paragraph 3.2.4.4.5). The area has gotten more interest parallel with more emphasis on sustainability in urban planning practice last, about, 15 years. The main objectives of Reykjavik's Master Plan 2010-2030 (see paragraph 3.2.4.6) is exactly to develop inhabited areas and transportation system in a more sustainable way and Artunshofdi cape could serve as one of the key elements in getting those goals.

3.3.1 Overview

Figure 3-55: Artunshofdi from different angles (Nýr miðbær og Sundabraut, 2007)

The Artunshofdi cape area is now occupied by businesses and activities that have different usage forms. In general those usage forms bring unwanted traffic and untidiness to the city and make the cape area to be an example of an area with low density and poor utilization of a land. It can thus be stated that the Artunshofdi area is a rather expensive area that host rather untidy activities, activities that does not fit well to a modern city structure.

As said then to the west the cape merge together with one of the largest outdoor recreational area of the city Ellidaardalur valley. The cape rises up from the vest and north and gives thus great view over the fjord area and the mouth of the salmon fishing river, Ellidaa. To south and east the area is well linked to large road systems like Miklabraut that is one of the main roads of the city, a road that lies central in the municipality and ends in the City Center.

The Artunshofdi area has a central location in Reykjavik municipality as well as in The Great Capital Area. It lies about 1,5 km from the center of residence of Reykjavik municipality and about 2,5 km from the center of residence of The Great Capital Area. At the south-west corner of the cape lays one of the largest intersections in the municipality, intersections where Reykjanesbraut road crosses the Miklabraut road. Reykjanesbraut is one of the main roads that link Reykjavik municipality to its neighboring municipalities of e.g. Kopavogur and Hafnarfjordur.

3.3.1.1 Type of companies/local activities

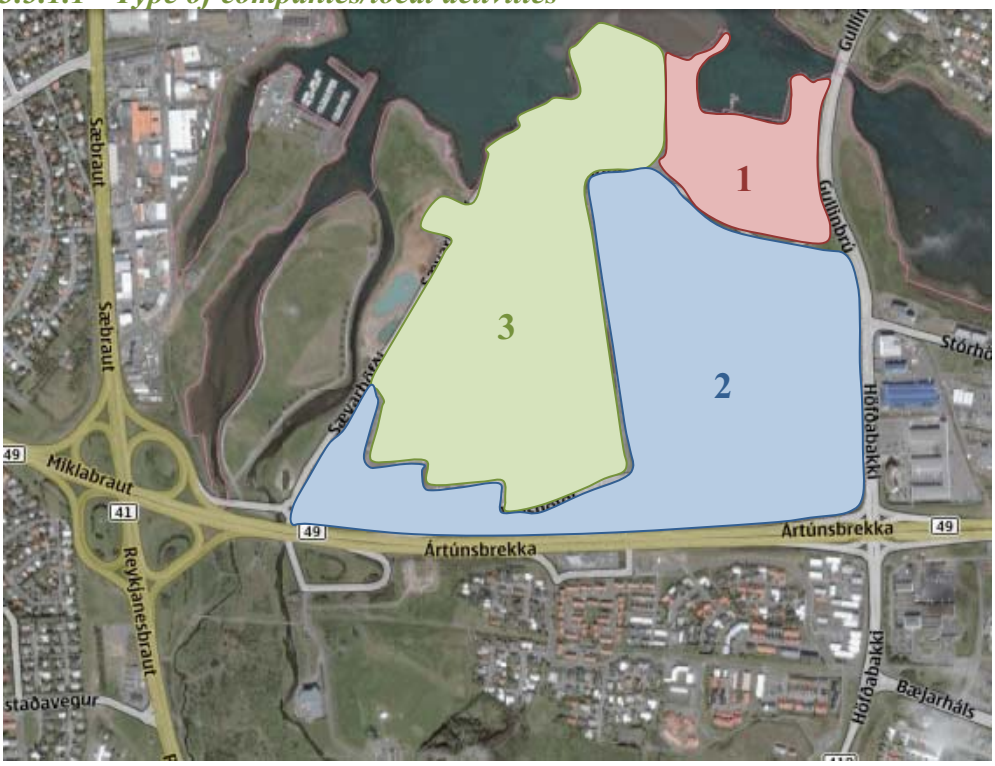


Figure 3-56: Different usage of the Artunshofdi cape (Já, 2012)

The area can be divided sharply in three parts as can been seen her above.

Part one is a rather modern residential quarter built around 1998 of roughly 8 ha (0,08 km^2) and goes under the name Bryggjuhverfi or The Harbor District. (Jónsson, Sigurðsson, Gíslason, Örvarsdóttir, & Jónsson, 2011) This district is the newest one of the whole Artunshofdi area and almost the only one that is used today for residential purposes (there is to be find e.g. hostels in part 2).

Figure 3-57: Part one, the Harbor District (Bryggjuhverfi) (Hjaltested, 2011)

Part two is a area that have multiple purposes and has a size of over 40 ha (0,4 km^2). It has in general a low structure building though there is to be found high-rises in the area. The main part of the area hosts garages and all kinds of workshops. Among these there is to be found office buildings, hostels, furniture shops, supermarkets, petrol stations and car dealers.

Figure 3-58: Different types of companies and usage of part two [(Hjaltested, 2011) and (Já, 2012)]

Part three has a size of around 38 ha (0,38 km^2) and it distinguish itself from the others by hosting primary manufacturing enterprises. Enterprises like Bjorgun a sand, gravel and pebbles extraction company, Malbikunarstodin an asphalt manufacturer, Steypustodin a concrete manufacturer and ISAGA a gas distribution company. There is though also to be found car workshop and a car dealer in this area.

Figure 3-59: Manufacturing enterprises of part three (Hjaltested, 2011)

3.3.2 Issues

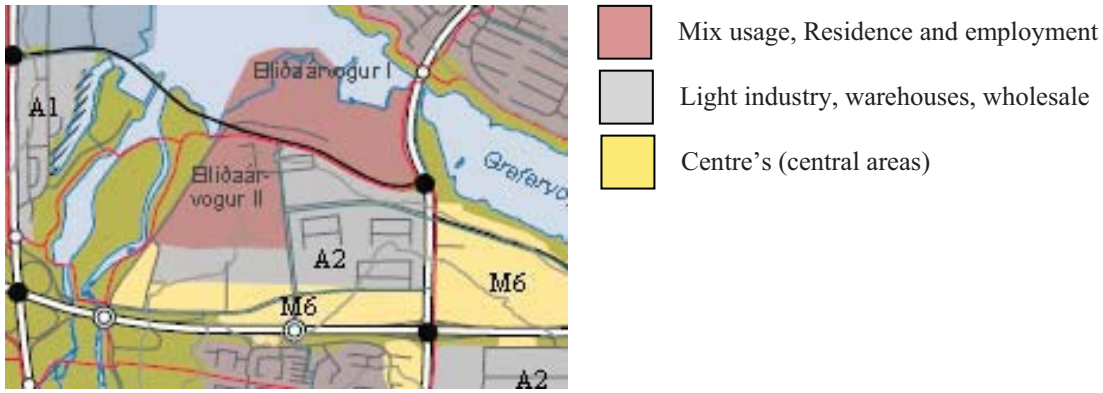


Figure 3-60: Planed usage of the Artunshofdi area concerning Reykjavik's Master Plan 2001-2024 (Aðalskipulag Reykjavíkur 2001-2024, n.d.)

According to the current Master Plan 2001-2024 then the area is to have different usage in the future. The Artunshofdi area shall be re-built and re-designed with the aim of having combination of housing, service and tidy businesses. The restoration of the area shall respect the design of the

already built Harbor District and that area shall preferably serve as a model for the future design of the cape. (Elliðaárvogur, n.d.)

By the Master Plan 2001-2024 it is quite clear that many of the businesses and companies of the Artunshofdi area is not wanted in the future development of the area. In the main part of the area there is expected to be built residential areas in combination with tidy businesses (red, in Figure 3-60). In the middle part of the area (grey (A2), in Figure 3-60) is to rise light industry areas that does not bring pollution and does not include workshops, offices or service and large shops. The south side of the area (yellow (M6), in Figure 3-60) is in the future to host Centre's. Centre's are defined in the Master Plan as area where large shops and offices are wanted. Light industry and workshops are as well allowed but preferably not residential areas and hotels. (Aðalskipulag Reykjavíkur 2001-2024, n.d.)

Today the cape is divided in multiple lots. These lots are owned or rented be many persons, companies or corporations. Some rental agreements have expired recently, some for long time ago and some are still valid and will not expired in the near future. Some owners have had the lots for long time and practice their businesses there meanwhile some have just recently became owners. Some of the new owners see potential in the area for their future businesses meanwhile others see opportunity to make good profit by invest in an area that is to be re-built in the near future. (Jónsson, Sigurðsson, Gíslason, Örvarsdóttir, & Jónsson, 2011)

3.3.3 Municipality plans

By the above it is obvious that the future vision of the Artunshofdi cape is quite different from its utilization today. To re-design an area is a one thing but to move many of its activities is another thing. By removing businesses from an area means that one have to relocate those businesses and occupy new areas that preferably are better "equipped" to serve these businesses. To take an example then some of the industrial activities in the cape are dependent on the closeness to the sea (gravel extraction companies like Bjorgun) and closeness to main artilleries of the city (asphalt and concrete companies like Malbikunarstodin and Steypustodin). The economic future of those companies relies on those facilities and thus relocation can be a delicate procedure. In current Master Plan the aim was to relocate some of those businesses, mainly the industrial once, to Geldingarnes peninsula but today that area is valued too much for those kinds of activities. Now the loudest voices are pinpointing Alfsnes peninsula, Holmsheidi heath or even to Hafnarfjordur municipality. At Alfsnes peninsula is good natural harbor conditions but as for now the area is lacing good transportation connections with the city, Holmshedi heath could host many of the smaller businesses like garage and workshops. The new Master Plan 2010-2030 is to tackle these issues of relocating and finding new areas for the activities that will be re-located. (Jónsson, Sigurðsson, Gíslason, Örvarsdóttir, & Jónsson, 2011) If Reykjavik municipality is to get their goal of stopping urban sprawl of the city and dense the built environment it is vital that the city gets control over the Artunshofdi area and manage to relocate many of the businesses there. (Sigurðsson H. , Interview, 2011)

It is estimated that until the year 2030 Reykjavik will have to provide about 14.500 new residential apartments and about 1.000.000 m^2 of employment areas. If Reykjavik's municipality ideas of getting the goal of having 80% of the future built-up inside the main populated area of the city there shall be built about 11.600 residential apartments and about 800.000 employment areas. According to the New Master Plan, there could in the Artunshofdi cape rise about 2.800 new residential apartments and 100.000 employments areas, as can be seen in Figure 3-61.

Figure 3-61: Artunshofdi cape usage in the future (Sigurðsson H. , Nýtt aðalskipulag til ársins 2030, 2011)

One of Reykjavik's goals, according to the new Master Plan is to strengthen the city image as a capital in an international context and to reinforce Reykjavik as a leading force in the country. In the Master Plan there is indicated that this will only be done by strengthening further the city economic life. According to the plan does Artunshofdi area have a part to play in this interplay as is showed in Figure 3-62.

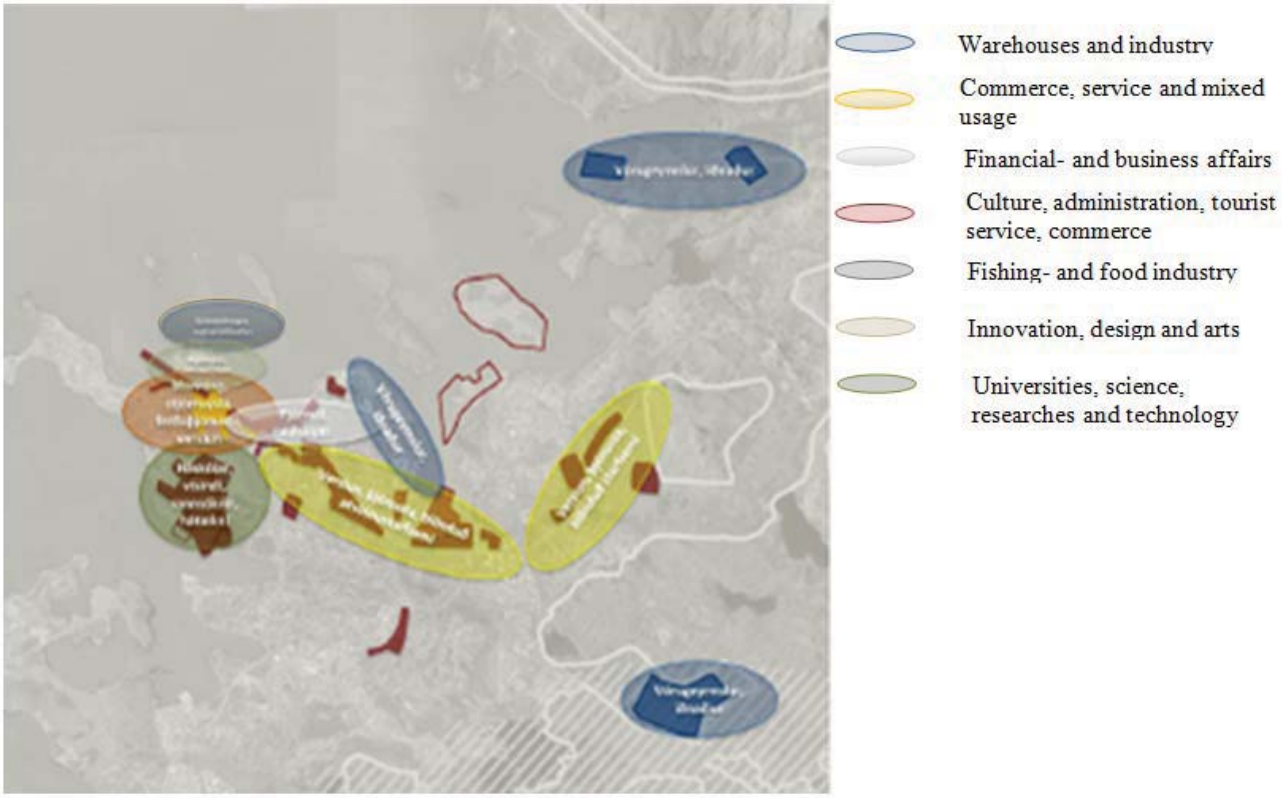


Figure 3-62: Artunshofdi role in Reykjavik's diverse economic life (Sigurðsson H. , Nýtt aðalskipulag til ársins 2030, 2011)

One of the most radical suggestions in the Master Plan 2010-2030 (that concerns the Artunshofdi cape) is to make a new transportation artery in the city. This suggestion is directly linked to Figure 3-62 here above. It is now become clear that the urban evolution of the city has opened up for new possibilities, possibilities that could relive under the pressure of the Miklabraut road that has served as a main transportation artery for decades. This suggestion is to make a new transportation artery or make one artery out of many smaller roads, an artery that could run from the city center to the outskirts of the main populated area of the city (see Figure 3-63).

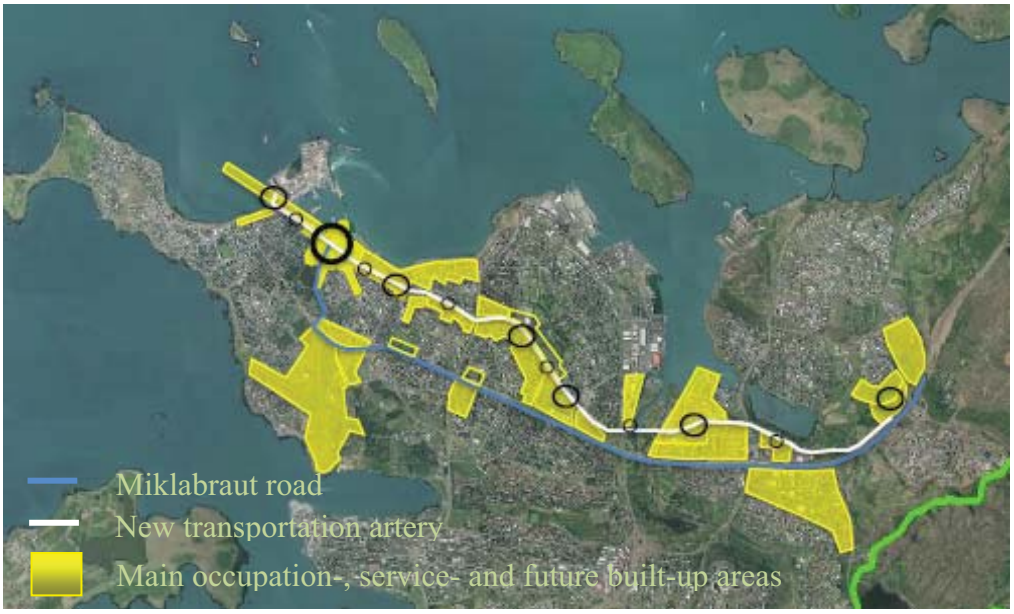


Figure 3-63: Idea of a new transportation artery in the city (Sigurðsson H. , Nýtt aðalskipulag til ársins 2030, 2011)

This suggestion, if treated right, could bring about highly sustainable solutions to the city, concerning its transportation problems. This new transportation artery lays in an area where most built-up possibilities in the city lie as well as many main occupation and service areas of the city (see yellow areas in Figure 3-63). This could clear the way for more ecological ways of travelling, if this artery would be built primary for public transport, bicycling and walking. This could as well open op for the possibility for Artunshofdi cape to be built up as a sustainable neighborhood. A neighborhood away from the city center, a neighborhood where there is possibility to live without having a car but still have a occupation in the city center. This opportunity has not opened up before in Reykjavik's urban development history. Now, it is possible to rebuilt one neighborhood in a highly sustainable manner and make it to a showcase for what is possible to accomplish in the city. By this the possibility of turning the mindset of the inhabitants of Reykjavik into more positive one concerning the principle of sustainability is getting near.

3.4 Section conclusion

The Icelandic saga and its urban history is striking, interesting, instructive and exciting all at once. Its center of gravity lies in the urban area of the south-west corner of the island were the Great Capital Area as well the center of Governance has its roots. The urban development history of Reykjavik municipality plays a great role as there the mass chose or was destined to settle and there the capital rose from a fertile soil. Reykjavik municipality grew to become the most populated municipality though not being the largest one. Reykjavik municipality urban development or the Great Capital Area urban development for that matter is a trial and error process that should be taken as a learning process for the future urban development. True it is recognized by many errors

but that's often what young cities are known of. As once under the wings of Denmark the Icelandic urban development practice was firstly influenced by their European roots. With the arrival of the American army, during World War II a whole new world opened up for the nation. The island got its independence (17. June 1944) and the society was now influenced from the other side of the Atlantic Ocean. As one part of Iceland is on the American continent and the other at the European continent the urban planning practice has played a game of ping pong ever since World War II. The result has in most cases been in favor of the American side as Reykjavik urban environment at the turn of the century and in the beginning of the 21st century was characterized by heavy traffic, large thoroughfares, congestion problems, car dependency, lack of public transport, large distances, many bedroom neighborhoods, lack of liveliness, large cluster of shops and dying neighborhood shopping. People were forced to use their cars whether the journey was for a renting a movie or purchase the daily groceries or service. And these trips were not always done by small eco-friendly cars, the cars were getting bigger, Four wheelers, 4x4 trucks, SUVs and off Road Vehicles were getting more and more common. People were getting used to this kind of living; people in Iceland had not experienced adversity for about 50 years. The economic boom had been there for a long time and the general public had forgotten their parents or grandparents struggle for basic necessities. The culture was therefore also changing; people were getting more distant in their "growing in size" homes and closed private cars pending from work and home, a journey that additionally was getting longer year by year. To follow the growth of the number in people's bank account suddenly became more exciting than following the growth of their own children. The Government and administration authorities and businesses also demanded this of their "workers", people had to work and the demand for more than 8 hours a day was growing. For the whole society this meant huge growth opportunities and as a derivation the society was getting spoiled. Companies and private investors started to expand and now the demand was to expand over the boundaries of the little island. The general public followed the lead of their administrative power and now it was not enough to drive only in Four wheelers. Now behind the Four wheeler there had to be a cart with at least two off-road motorcycles, motor sledges, boats, large caravans so camping could be almost identical to your own home or golf carts so not to strain your ankles during that ever growing sport. Now peoples demand was also to have summerhouses and not any traditional summerhouses where minimalism was the key word. Now summerhouses had to be villas with all the modern technology and preferably with an isolated location. A large land was good, buying a deserted farmland was better, isolated fjord was one step closer to the dream and a little island on your own was the ultimatum.

The crises in 2008 put an end to all of this and the Reykjavik municipality as the rest of the country is licking its paw like a cat that has been beaten in a fight. In the wake of the crises the shame is imminent and everybody is thinking how it got so far. Resurrection processes and tidying up the society is now ongoing and the planning practice as others is trying to find its way in a highly altered society with a completely different attitude. In these hard times sustainability comes as a fresh breeze with all its analyzing and mapping processes of the society. Considering the troubled times Reykjavik has done good to participate and fulfill the sustainability agenda. It has followed all the "rules" and done all the "paper work" so it could be called a more sustainable municipality. Due to this the municipality knows now where it stands in global comparison and has sat the course where to head in the coming decades.

It is apparent from the above section that the "paper work" is in place and the municipality is aware of its status as highly car oriented and sprawl like municipality. There is thus nothing that hindered the municipality of starting the "cleansing" process. According to the findings in this section Reykjavik municipality administration has put an end to the sprawl and is seeking inwards with

infill and intensification projects and is putting emphasis on social and physical appearance of the municipality and its inhabitants. What is needed now is to get the whole society on board the sustainability train so that an acceptable result can be gained. There the problem lies now, people have no confidence in the authorities of the municipality or the country in that matter. The saga of the municipality is filled with rivalry between the people in authority and others sometimes called “elite" of the society and individualistic approaches of these and the ones that have been in charge. These leading forces of the society have through individualistic approaches hindered the urban development of the municipality. The obvious examples are the party rivalry inside the municipality, rivalry between municipalities in the Great Capital Area, the tackling of the airport issue and other building projects as well as the course taken concerning public transportation. In common, how these have been tackled, has nothing to do with general public interests that these authority personas should be guarding. These actions sit deeply buried in the chest of the general public and the confidence in for the ones that shall lead the future development of the municipality is not high.

If treated right the Artunshofdi cape could in the future be known as the area that showed people the engagement of the authorities for the society. The area could be known as the area that helped people to gain confidence in the planning practice and be the area that urged more people to step aboard the sustainability train. The area has all the abilities to be a highly sustainable neighborhood where trials with new public transport system that could inspire the future development of the city could be made. According to the above section the vitality of the neighborhood for the future urban development of Reykjavik municipality is evident. The build up can easily be damaged by more rivalry and corrupted plans. Now it is up to the authority persons to show their engagement towards the inhabitants and inspire the general public so a harmony can be gained again in the society.

In the following chapter the findings in the first two sections of this study will be discussed so that a conclusion can be added.

4 DISCUSSION

Changes in one way or another, in urban areas will always bring about new emphasis in a city's urban structure. The "need" and desire of the inhabitants and the economic circumstances will influence this, as well as that time trends in urban development practice. Social and financial growth is linked to expansion and scattered living pattern meanwhile decline is linked to seeking inwards and more compact living. These constant changing urban infrastructure and emphasizes gives each city a unique character and in that way the city area is like a living body constantly moving and changing shapes. This movement should be harnessed or controlled to a certain degree. It should not contaminate the character or the identity but be more of a leading force setting rules and restrictions. Just like real life parents to a child the city is in need for guidance through its lifetime up's and downs by its administration. This administration is just like real life parents, a highly complicated body.

I started this study with the question: ***How can a new land-use strategy in Reykjavik re-shape outworn visions and create new transportation possibilities that lead to less automobile dependency and more sustainability of the society?***

In the following this intimate and delicate interplay between different actors of the society will be discussed and the effect it has had on Reykjavik's vision and transportation possibilities. I will start out by reflecting upon how the urban development has been influenced by the past time utopias visions, movements and planning concepts. Then I will reflect upon what main influences the post-war era brought upon the urban development followed by a paragraph that shows the maturity time of the municipality before the political turmoil started. The main discussion will be held out in the two latter paragraphs 4.4 The long road to sustainability and 4.5 Transportation habits and land-use strategies. In the last part of this section a discussion about the Artunshofdi cape area will be held followed by my vision for the future atmosphere in the cape. The discussion section will then end with my reflection about what will happen in the future according to present attitudes.

4.1 Past times influences

Influences are a vague figure of speech in urban planning practice and even if they are not written down somewhere that does not mean that the planner was not influenced by anything. As was said in the first part of the Theoretical Section of this study, *"much of what planners do today reflects their understanding of practice and their aspirations as molded by the planning theories they have read or heard about, or by the ideas of others which, in turn, were molded by theories"* (Stiftel, 2000, p.4). So the planning practice is always influenced by something and in the following a reflection of Reykjavik's past influences will be held out.

Reykjavik will probably never, or at least not in the near future, been recognized for its organized gardens and the aesthetic they give to the city. This is not to say that those gardens aren't beautiful or majestic but Icelanders have not learned to appreciate them enough. This is partly due to early planning not taking into consideration theories of men like Fredrick Law Olmsted and that park culture has simply not gotten to grow in Iceland as summers are short and the closeness of the city to open nature is vast. In the early days, parks in Reykjavik were built like separate units of the city. They were not built like an extension of the city landscape and often shielded with rows of trees or framed with large roads like one of the largest park in Reykjavik, Klambratun (see Figure 4-1). The latter planning methods of the city are trying to remedy this by connecting most green areas of the city with bicycle paths and pathways (see paragraph 3.2.4.4.6 Green areas). The city is also trying to lure people or bring these traditional organized gardens "back" to the people by showing them the beauty of the park culture by e.g. providing visitors with traditional outdoor games (Dótakassi á

Klambratúni, 2011). The origin of this project is to urge people to use the parks for stay and play, a culture that has not previously taken hold in Reykjavik but is a growing one today (with rising temperature in the world). The green areas of the city are many and of all sorts from traditional parks, flower gardens and vegetable gardens to areas with horse riding and fishing possibilities. Maybe the largest problem of today isn't the gardens and their possibilities but rather the inhabitants' character and stubbornness of not utilizing these great areas that the City Administration so profoundly tries to provide to its inhabitants.

Figure 4-1: The Klambratun park (Miklatún, n.d.)

So the influence of the urban parks movement of Fredrick Law Olmsted is maybe not so apparent in the city planning of Reykjavik but that is not to say about Ebenezer's Howards Garden City Movement. The Garden City Movement, as it was a prior to the Satellite Planning Principle is definitely a huge influential force in the urban development of Reykjavik. Reykjavik has grown from its old City Centre by satellite planning where new neighborhoods have emerged at the fringe and then the gap in-between has been filled with additional houses or neighborhoods. Fortunately some aspects of geography have hindered this growth and today many of those satellite towns could function as independent units. As many of the workplaces are linked to the down town area most of these satellite towns are though just bedroom neighborhoods and as such lack all liveliness and mix of usage. Though the original purpose of Satellite planning or Garden City for that matter was not fulfilled a huge possibility lies in these neighborhoods. That possibility lies in the usage of the concepts of New Urbanism that will be looked at later on.

Figure 4-2: The office park of Borgartun road (Já, 2012)

Sadly, Le Corbusier principles have been used in modern time Reykjavik. It is sadly as his theories has been used in Reykjavik as his theories have been used in Reykjavik as in many other cities in a pervasive way i.e. his idea of sky-scrapers in a park have been turned into sky-scrapers in the parking lot. Example of this is the office park of Borgartun road, and even more sadly there is the head office for Reykjavik's planning department. The same could be said about the skyline "park" that faces the tourists when sailing into the harbor of Reykjavik, large skyline with modern "skyscrapers" was put there to impress the visitors and get expensive apartments surrounded by concrete and hiding the cozy old town, one of the main reasons for visitors to visit the downtown area

Figure 4-3: Reykjavik skyline welcoming tourist when arriving at the harbor (Efstasund, 2011)

Zoning has been one of the leading concepts in Reykjavik's planning practice as the municipality has been divided into different usage categories (see the 1948 Master Plan of Reykjavik paragraph 3.2.1.1 Planning became a practice). Reykjavik has thus physically been shaped according to zoning meanwhile on a more sociological level, one might think that Frank Lloyd Wright syndrome of Broadacre city has affected the inhabitants. If Broadacre City had become a reality with all its suburban sprawl, individually owned houses and reliance on telecommunication and on privately owned transportation means it had marked the end of social contact and liveliness of cities. This tendency is found in many of the neighborhoods of Reykjavik, people only want to have social account with their neighbor on their own premise and thus want to be able to decide themselves how much (or even at all) contact to have with their neighbors. This has isolated people from each other, people tend to drive to the nearest shopping mall and grocery store and there people try to focus their eyes at the shelves or the huge grocery carriage and thus trying to avoid close encounter with people they might know from their kid's school, coworkers or distant family members. Every task of the day is done by driving from door to door, that's how dependent a general Icelander is on its automobile.

4.2 Post-War influences

According to Valsson (2003, p.384) *"it is a common characteristic of planning in most areas in the world that post-war city planning was in general very bad"*. In Iceland the post war years marked a great shift as Iceland became a republic and ended its union with Denmark. Now all decisions were in the hand of the Icelandic nation and its administration. In this post-war time two master plans were released for Reykjavik municipality. These plans have showed to be of great importance

concerning Reykjavik's urban development future. These plans were the master plan of 1948 and 1957 and have shown to be the key plans that started a trend that is still going on today. Before the making of these plans Reykjavik was relatively densely built in a relatively concentrated area and the city was in a certain stability state. The World War II brought blooming times to Reykjavik and these two plans captured all the latest fashion trends of the planning practice on both side of the Atlantic Ocean and symbolizes how immature Reykjavik's urban planning practice was and how open and un-critical it was for foreign influences. These influences were e.g. the usage of the concepts of Zoning, Satellite Planning, Urban Sprawl and Suburban Pattern (see paragraphs 2.2.1 - 2.2.4 and 2.4.2). Reykjavik was not a town that had been highly affected by the Industrial Revolution, though pollution put its mark on the urban environment. Despite that the need for Zoning up the municipality into industry, residential, institutions and city center was evident. The car got a leading role and the road system was expanded along with building of residential neighborhoods in some distance to the city center. This was a transition era of the planning practice in Iceland as in the rest of the Western World where the "golden age" of planning was ending and a "system planning" emerging (see paragraph 2.3). As both being a top-down planning practice then what distinguished them were the huge technological differences i.e. the emergence of the computer and its system. As said, in this post-War era Reykjavik bloomed and its seeds were scattered around in form of suburban neighborhoods. Its root canals, the main roads thickened, allowing more cars to stream through and by that secured its existence. This became the first steps of Reykjavik's municipality towards a suburban sprawl a symptom for a city with degrading liveliness and human relations, an "Auto City".

4.3 1960-1980 maturity time

The planning practice of Reykjavik municipality in the period from 1960 to 1980 was characterized by insecurity and conflicts (see paragraph 3.2.2). It was apparent that the municipality was rising and that in a fast pace. This vast growth of the municipality was apparently too much the urban planners of that time as e.g. the job of the master plan 1965 was given to foreign planners. A team of Danish planners were given the role of choosing which and in what way the municipality should develop. Their advises about moving the city center, sharp division of usage and building large bedroom neighborhoods on the other side of the urban fringe was bad for the urban development of the municipality and only put more fuel in the urban sprawl. Their plan was in general built upon outworn planning methods but the urban planning environment in Reykjavik was not making their job simpler. The rising conflict between the municipality of Reykjavik and Kopavogur and the lack of governmental control thereabout did not help the work of the Danes. Neither did the emphasis and decision of Reykjavik's City Council of facilitating the car and the car ownership in the municipality. The idea of relocating the city center could have helped the future urban development but the delay or maybe the insecurity of that time administration resulted in scattering of the commercial activities that otherwise could have been focused at one place i.e. in the new city center.

It was first around 1970 that the general public of Iceland started to afford to travel abroad and study abroad. Until then it was only the few of the wealthier families that had this privilege. This created a strange atmosphere in the working environment that is only now, 40 years later, leveling out. This relatively small group of people, elite, has had monopole rights over the best jobs and positions in the country. That means that the elite has had the possibility to force their often egoistic ideologies and principles upon the general public, a atmosphere that still can been seen remains of today, though not as obvious as it was in the old days. (Valsson, 2003)

> *"One characteristic of Icelandic society has been that the educated class has been small and closely knit, often related. In fact, it has been able to bathe itself in the glory of its education because the education has provided them with possibilities of getting into a position of power and influence and giving them the ability to shape the lives of others."* (Valsson, 2003, p.372)

Due to this and other things people have had a mistrust in the planning practice and misunderstanding, and even prejudice, on what the nature of planning is. This lead to the planning practice being looked at as a practice that tried to fixate everything and make things inflexible. Additionally this lead to the planning practice getting the image of being some supreme authority that was meant to rule and that planning automatically meant an end to dynamic changes in the society. (Valsson, 2003)

The rise in civil-rights movements and the Hippy Movement put its mark on Reykjavik's urban development practice by trying to set an end of top-down planning and it certainly gave rise to bottom-up planning. The bottom-up planning puts demand on public participation in urban development and aims at putting an end to individualism, where planning only serves the few, the elite. In 1980 this had though not become the case, corruption forces in the society had still the upper hand and a political unbalance and turmoil was only at its starting point. The upcoming years did not take notice of the general public will or need as the power struggle in the municipality resulted in few years of wasted efforts concerning urban development scheme (e.g. 4 years of urban planning were cast aside due to conflict between the main leading parties).

In 1980 Reykjavik was growing up. It had a hard time of finding its way in the big world of planning and the general public was just a pawn in a power struggle that was only showing the very tip of the iceberg. Up until the turn of the century Reykjavik was planned with great admiration for the car as many cities at that time. The power struggle and huge interest conflicts of the two main political parties, Leftist and Conservative lasted throughout the century resulting in constantly changing directions in the urban development that resulted in mistrust of the general public over the municipality administration. The economic boom after the year 2000 facilitated individualistic approaches in the administration of the whole country that lead to the rolling over of the iceberg, in 2008, that now revealed the vast corruption that had been going on in the society.

In 30 years Reykjavik had grown-up with all its pros and cons. The urban actors had burned themselves in the process resulting in that the planning practice was going back to the roots with a huge weight on their shoulders. Today Reykjavik's planning practice has been fighting a hard battle of remedying mistakes of the past and a resurrection process had begun in the society. The waves from the rollover of the iceberg are fading out and the lesson learned is that the planning practice as a profession is relatively young profession in Reykjavik. This profession has been forced to mature in a short time to catch up with the modern, international, standards. The urban planning practice are thus introducing their answer that reveals a vast change in work procedures, resulting in the newer Master Plans being advocates of the new planning practice of the 21st century, i.e. sustainability.

4.4 The long road to sustainability

Though Sustainability is a global movement, an action at the local levels is what is needed for sustainability to get its chance. What is needed are holistic and united changes so the Sustainability concept is to prevail in modern societies. As an actor in the global interplay Iceland is bound to participate and there it is up to the capital is to take the first steps and set an example. Reykjavik's

administration is not capable of doing it on their own, there is need for the participation of the inhabitants, politicians, as well as the municipality companies and institutions. Workplaces, schools, private developers, inhabitants and interest groups have to join hands in creating satisfactory or acceptable environment for sustainable thinking or action whether it being in the form of flexible work hours (flexi times), improved facilities for those who choose the alternative means of transport or subsidy of bus fares to those who choose public transport.

Becoming a sustainable city is not about forcing people to sell their cars or to take the bicycle or walk all their errands. It is about providing people realistic choices or alternatives when it comes down to choosing transportation modes in any given relation. Today's inhabitants of Reykjavik do not have that choice; it demands great skills and character to choose the bicycle and walking before the car. The transportation system is demanding these softer modes of transportation and not all workplaces provide satisfactory facilities for bathing and changing of clothes. Additionally the public transportation process is a time consuming process that does not offer unequivocal benefits above the private car like it should do. For example neighborhood shopping, grocery stores and malls does not provide good facilities for bicyclers and thus does not make them feel welcome. The amount of parking spaces that normally are linked to those tell another story and welcome those who travel by cars. The ones that are capable of doing mass shopping are more welcome than the ones that only comes by bike and are constrained by that travel mode.

Figure 4-4: Picture of neighborhood shops and difference in car and bicycle facilities around them (Hjaltested, 2011)

> *"Sustainability is not likely to be a state that is reached, but one toward which the world must constantly strive, Sustainability is a vision and a process, not an end product"* (Newman and Kenworthy, 1999, p.5)

As Newman and Kenworthy (1999) here above pinpoint then sustainability is more a state of mind than a condition. It demands the participation of all the actors of a society and to do so a shift is

needed in the mindset of all the inhabitants. If this is too much to ask of the Reykjavik area is what will be discussed in the following.

4.4.1 Compact City or New Urbanism

As said earlier in the theoretical section then the theory of Compact City (Smart Growth) focuses on urban intensification, creating limits to urban growth, encouraging mixed-use development and placing a greater focus on the role of public transportation and quality urban design. The Theory of New Urbanism aims at integrating diverse, walkable, transit-served, less automobile dependent communities with urban design.

Both theories focus on sustainable urban development and as such they are two different branches on the same trunk. For a city like Reykjavik it would not be wise to choose the one over the other as both theories have their pros and cons. The "nostalgic" characteristic of New Urbanism is not worse than the critique that Compact city gets of focusing too much on the environmental part of sustainability. Reykjavik is best of by honoring both theories and by that choose the best from both "worlds". The geographical structure of the municipality is highly mirrored in New Urbanism with its identifiable centers and edges of neighborhoods but could not separate more concerning the architectural design. The need to densify with infill or intensification projects that the Compact city model provides is highly related to the need of Reykjavik as the city density of Reykjavik's main populated area is only about 18,7 people per hectare (see Appendix 4: Density statistics) where according to Newman and Kenworthy (1989) low density is about 25 people per hectare.

With that said and if one would be forced to choose the one over the other the choice would fall on the theory of New Urbanism. Both theories have many resemblances but it seems that the new urbanism is just capable of more. Ellis (2002) describes New Urbanism main features as following:

> *"New Urbanists subscribe to definite principles which are clearly stated in the CNU Charter. By now, the list is familiar: metropolitan regions that are composed of well-structured cities, towns, and neighbourhoods with identifiable centres and edges; compact development that preserves farmland and environmentally sensitive areas; infill development to revitalize city centres; interconnected streets, friendly to pedestrians and cyclists, often in modified grid or web-like patterns; mixed land uses rather than single-use pods; discreet placement of garages and parking spaces to avoid auto-dominated landscapes; transit-oriented development (TOD); well-designed and sited civic buildings and public gathering places; the use of building and street and building typologies to create coherent urban form; high-quality parks and conservation lands used to define and connect neighbourhoods and districts; and architectural design that shows respect for local history and regional character "* (Ellis, 2002, p.262)

The theory of New Urbanism comes in a very solid package, i.e. the Charter of New Urbanism (CNU) and have all the ability of tackling the satellite town pattern that Reykjavik is facing. In many aspects it could be said that the Compact City theory has already been incorporated into the theory of New Urbanism, so many are the resemblances.

4.4.2 Where is the heart beating

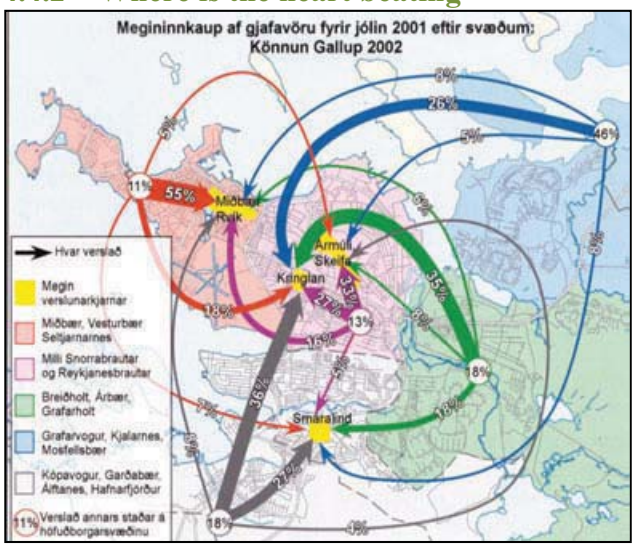


Figure 4-5: Main shopping areas, for retail shopping, in the Great Capital Area in 2001 (Valsson, 2003)

There are mainly four retail areas in the Great Capital Area, it is the shopping district of the City Centre and Armuli-Skeifa and the shopping malls Kringlan and Smaralind. Three of those are inside the boundaries of Reykjavik municipality and thus it creates much wealth as well as it increases the burden on the municipality traffic system. The arrows in Figure 4-5 shows that the Kringlan shopping mall gets the largest share of the retail shopping and that those who use the City Centre shopping district are primarily the ones that live west of the area. (Valsson, 2003) It could seem strange to show a picture of shopping habits when dealing with the question of where the heart is beating in a city. In Reykjavik it is though apparent during Christmas time that the heart is beating in the Kringlan shopping mall. Kringlan shopping mall is located in the Kringlumyri moor where two of the municipality largest roads, Miklabraut and Kringlumyrarbraut, cross each other. As dealt with in paragraph 3.2.4.3 these two are the main (and one of the most dangerous) through fares in the municipality and they feed Kringlan shopping mall with visitors and possible buyers. Though this figure shows the Christmas shopping this, sadly is an image that reflects the reality. People tend to only use the shops of the city central to get the spirit of Christmas and the warmth of the summer sunshine.

When it comes to buying groceries the picture looks like the one in Figure 4-6. It show the placement of grocery stores in Reykjavik municipality in 1981 and then again in 2001.

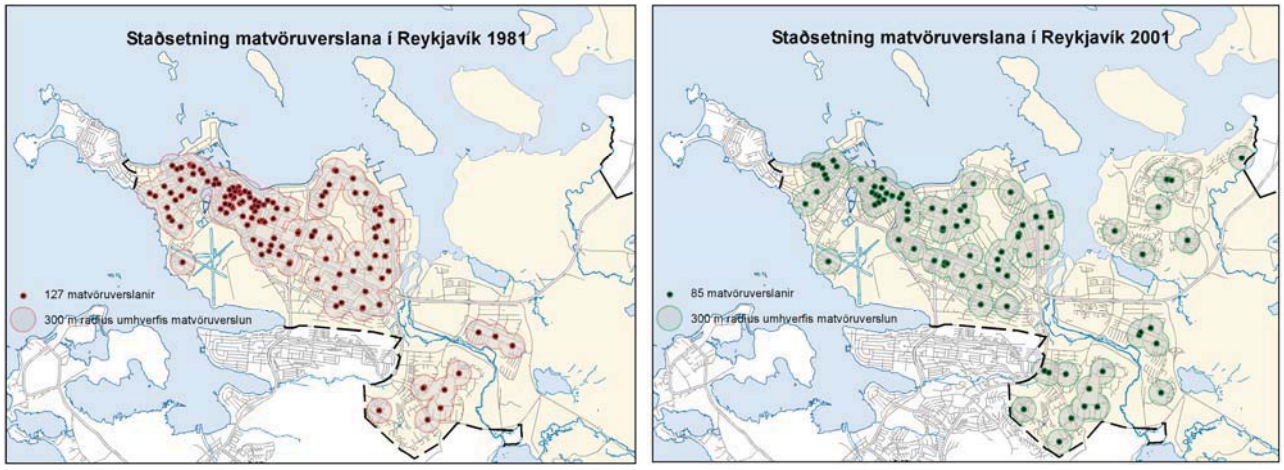


Figure 4-6: Placement of grocery stores in Reykjavik Municipality in 1981 (T.L) and 2001 (T.R.) (Reykjavíkurborg, 2001)

From the year 1981 to 2001 the grocery stores decreased from 127 to 85 stores. Parallel to this Reykjavik's population rose from 84.593 to 112.268 an increase of about 28.000 persons (see Appendix 2: Iceland in numbers). Large neighborhoods were added to the municipality as well during this period and this resulted in development that has not ended yet. This development, (seen in Figure 4-6) shows that the little grocery stores of the older neighborhoods are "thinning out" and grocery stores of the newer neighborhoods are getting larger. This is directly linked to the last century's growing car ownership of the inhabitants which is the number one factor leading to the death of small neighborhood shopping. The shopping behavior is that people shop in one of the large grocery stores (located e.g. in Skeifan area) once, twice or three times each week and then uses the smaller "neighborhood" grocery stores and ever growing petrol stations along the main thoroughfares there in between for forgotten necessities. (Reykjavíkurborg, 2001)

Figure 4-7: Center of residence in 2010 [(Google Maps, 2012) and (Miðja Búsetu, n.d.)]

As described in paragraph 3.2.4.4 Reykjavik's built environment the center of residence in Reykjavik municipality is moving eastward direction and the center of service, administration and business that serves the Great Capital Area as well as the country as a whole (Center of National Interest) stretches itself in the same direction from its starting point in the old City Centre. The city

authorities answer to this development is to resist by trying to locate many of the large education and health institutions in close proximity to the City Centre. The newest examples are to be seen in the ever growing Science Park, the enlargement of the Landspitali University Hospital and the placement of the country's second largest university, Reykjavik University, that used to be located a more eastern part of the municipality (see Figure 4-7). Understandably the municipality wants to secure the businesses to withstand their position inside of the municipality boundaries (and thus looking at the municipality benefits instead of the benefits of the whole Great Capital Area) but this does not make any sense when looking at sustainability objectives. True, one of the largest development project lies in the vicinity of all these institutions i.e. the buildup of the old airport area of Reykjavik airport. There, (see paragraph 3.2.3.1) a residential area is to rise, that will support and inject life into the old City Centre. In this area students and members of the working society of these downtown institutions could choose to live without having the urge to own a car. Despite that the majority of the employees of these institutions live in the more eastern part of Reykjavik municipality or in neighboring municipalities. This means that by having these large occupational institutions all packed at one location the majority of all students and employees have to travel from their homes every morning and afternoon down to this "hot spot" of the Capital. This puts restraints on the transportation system as the public transportation has not had the opportunity to grow alongside this population boom that the Great Capital Area has been facing since World War II.

When looking at the larger picture one can say that people are pending back and forth in the whole municipality whether it is for grocery or retail shopping or for work or getting the service needed. This forced or chosen behavior is highly unsustainable and in no relation to the concept of New Urbanism or the Compact City model for that matter. Reykjavik's heart will always be beating in its old City Centre and that will not be changed in the future. Nowadays, administration, culture activities, restaurants and cafes characterizes most city centers while increased tourist activity is the one that gives it energy. It could be said that the Great Capital Area is giving birth to a new city centre in the Kringlan and Armuli-Skeifa area and that this area is getting a certain resurrection. Hopefully the city administration will take this matter more firmly in hand in the future and try to resist this pattern by controlling the size of shops and their location so a more sustainable form can be maintained inside the municipality boarders. In a certain way, that was what Reykjavik administration did when the Kringlan shopping mall was built in 1987. At first it was to be double the size it is today but that was hindered as it was estimated that it would have meant the end of shopping in the old City Centre (Reykjavíkurborg, 2001). It seems that Reykjavik authorities have forgotten this mindset and spirit in the blooming times from the opening of the Kringlan shopping mall. Shops and service in a city have to be controlled so that the more sustainable living pattern of neighborhood shopping is to be restored again. In tackling the question of where is the heart of the city beating? It is my hope that in the near future one can rephrase this question by asking instead, where is the heart of the neighborhood beating?

4.4.3 Municipality boundaries/ Political struggle/individualistic point a view

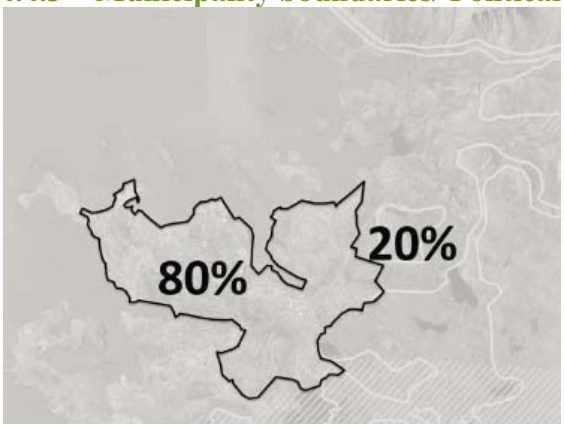


Figure 4-8: The New Master Plan vision about densing the main populated area of the municipality (Sigurðsson H. , Nýtt aðalskipulag til ársins 2030, 2011)

As said holistic and united changes are needed so that the concept of sustainability is to prevail in modern societies. Reykjavik has taken a step forward and published (in its new Master Plan 2010-2030) that through urban containment and urban intensification at the local level they will try to gain more sustainability. At a local level this is all good but more radical measures are needed. These are e.g. a united regional effort in the Great Capital Area, neutralization of political conflicts and dissolvement of individualistic approaches and corrupting forces of the society.

The Great Capital Area is a relative small area where there are eight municipalities each with their independent elected council. As such this area is a "playground" where the atmosphere is filled with competition and rivalry. Reykjavik as the most "powerful" municipality has to stand its ground to keep up its status meanwhile the other seven municipalities try to get their share of the cake. Reykjavik is also the leading municipality that in the quest for more sustainability but the municipality is though in a great dilemma as being a capital area and thus an actor in the global arena with all the obligations that it has while being hindered to get real results because of this local rivalry. This rivalry between the municipalities is the prime source of what hinders sustainability processes and it can been seen in the independent battle of each municipality to try to provide and thus lure businesses and inhabitants as that's what brings wealth into the municipality cash register. Each municipality thus fights its own battle and the battle rules are the same as in the open market of businesses. As such, when fighting by the laws of the free market there is nothing abnormal about the situation of the Great Capital Area. This is though highly unfortunate when it comes to maintaining or striving towards more sustainability in an area. If one municipality offer e.g. cheaper building lots and thus lower prices of apartments while another offer more income possibilities people are tempted to live in one municipality and work in another and thus travelling or pending back and forth. This is then encouraged by the Government if it is generous enough to provide a good linkage between municipalities in form of highways. It is also a daring decision of Reykjavik municipality to publish that in the coming years they will concentrate on building up on "brownfields" sites as that could give the other municipality the perfect opportunity to lure private developers and investors into its municipalities by promising them "greenfields" sites instead. To become more sustainable a union or merger of the municipalities of the Great Capital Area is needed. According to Sigurðsson H.(interview, 2011) this is not likely to happen as there is no political will for doing so. He points out that ideas have emerged of making one Master Plan over all eight municipalities, but legally it is not likely to succeed. What could be successful is to make a Regional Plan that has the same detail niveau as Master Plan and in that manner united goals could

be made for the future urban development of the Great Capital Area. According to Sigurðsson H.(interview, 2011) such measurements will though not stand the ground when the economy will start growing again in the area. Today´s economic circumstances, after the crash in 2008, have left the Great Capital Area more humble and more willing to participate in problem solving, a circumstance that does not prevail when the economic growth starts again and developers and investors starts knocking on the municipalities doors.

Political conflict is though not only to be found between municipalities but also between different parties of each municipality. Throughout this study a huge rivalry has been pointed out between, mainly, the left wing and the right wing in the political landscape of Reykjavik. A rivalry between leading parties gives unstable atmosphere in a municipality where voters start to lose faith in the leading people of the society. This results in that when important decisions are made they are met with great distrust of the inhabitants and are generally opposed. If prolonged this atmosphere cannot help the concepts of sustainability. This dreadful political atmosphere in Reykjavik has been going on since 1978 (see paragraph 3.2.2) when Leftist won the city council election. Many years up until then the Conservatives had governed and thus conflicts had not set its mark on the urban development practice. This is not to say that only one leading party should govern the city to get good result in urban development matters, this is more to say that the planning practice should have more to say. The work of a planner should be as politically independent as possible. Sigurðsson H.(interview, 2011) also has a point when he says that a certain change of view has been characterizing the political landscape the years before the crash in 2008 and today. He means that now when the world is getting more open and boundaries are getting vaguer and where many of the nations young people are starting to study and work abroad and getting more familiarized to what exists in the world and what can be accomplished, a change of view has been occurring. Sigurðsson H.(interview, 2011) means that *"this sustainable view is in fact not party related but more generation related, there is now upcoming new generation of politicians that all are in favor of this sustainable idea"*. If he is right or wrong is well kept in the future and hopefully the future will show us that sustainability was not only a "buzz" word used in the beginning of the 21st century.

The Icelandic nation is a stubborn, independent and a proud nation that is used to working itself out of problems and hard times with persistence and discipline. Future generations struggle and problems has thought us to put worries and troubles behind us and look forward meanwhile working us out of crises, "what has happened, happened and that lies buried in the past". This gives the nation a certain naïve shade as corrupted forces get to bloom in a society where people have tendency to think this way. The general public has been used by corrupted political and individual forces in the society as a pawn in a game where they have crowned them self queens and kings. This is all too well known from the economic and political crisis in 2008 where almost over a night the society was pushed down into the mud and shame was brought upon the nation´s good name.

The general public of Iceland, as members of a republic, are willing to work themselves out of hard times but in order maintain the resurrection work the home has to become a shelter where all the worries of the world are abandoned. This is why a certain type of "nimbyism" is firmly grown into the nation. People want to "protect their turf" with all means possible so not to let the problems of the real world influence it. This is not to free all the inhabitants from responsibility as these "simple souls" allowed this situation spiral and the society fully participated in the late 20th century period of prosperity. The general public of Iceland had let themselves become spoiled in the start of the 21st century and had forgotten all the rules, benefits and the meaning behind being a republic. The general public was getting used to the qualities the modern society had given to them and brought them on a silver plate. This I will look into in next paragraph.

I just hope that the nation has learned from the crises in 2008 and its past difficulties that something can just not been put behind us and left to grow again into weed. Weeds have to be taken up by its roots and prevention measures have to be taken so its existence will come to an end.

4.5 Transportation habits and land-use strategies

"An overemphasis on road building and an underemphasis on transit and the pedestrian environment can spin a city into a decline phase". (Newman and Kenworthy, 1999, p.55)

Transportation habits and land-use strategies in cities are formed by the urban development practice that "governs" at each time. As said in paragraph 3.2.4.5 The Urban planning actors , *"the politics feel a pressure coming from private parties and listen to the residence and those that protest, the politics put pressure on the officials and planners and by that, maybe a solid foundation in urban development is gained"*. To change transportation habits and land-use strategies is thus not a short term project and can only be done by using many different measures and by having all the actors of the society participate. This involves changing planning methods, dense the settlements encourage mix usage and re-design neighborhoods with sustainable approaches. The main procedures to take to change transportation habits in a society as the one in Reykjavik is to increase the priority of the public transportation means, improve condition for walking and bicycling and increase education, instruction, guidance and motivation for inhabitants to change over to the more sustainable means of transportation.

Reykjavik has (as described in paragraph 3.2.4.2 Sustainability of Reykjavik's urban development) put considerable amount of work and time into these matters, with working on and publishing following plans:

- **Shaping Reykjavik (2006)**, a plan of action to follow through the concepts of Local Agenda 21
- **The Future is in the Air (2009)**, a plan to improve the climate and air quality inside the city boarders
- **The Transport Policy (2006)**, that focuses on the aspects needed when developing a city and its transportation network
- **Green steps for Reykjavik (2009)**, an implementation plan showing how Reykjavik intends to lead the way and be a role model in the campaign towards sustainability and finally
- **Reykjavik the Bicycle City (2010)**, a strategy plan to introduce and increase the share of bicycling in the city and open up the eyes of the inhabitants for bicycling as a realistic way to travel.

The same can be said about the municipality work of registering its sustainability "level". This Reykjavik municipality has started to do through the use of indicators.

4.5.1 Usage of indicators

Reykjavik authorities have spent considerable amount of time and money to register how the city has been developing and indicating what the future goals are. Since 2003 the city has been monitoring its sustainability level through ecologic indicators monitoring. These the city can use to indicate its sustainability level, how far it has reached and where to go as well to give vital information about Reykjavik's environment. The indicators to be monitored are about 15 and range from air-, water- and soil pollution to energy- and water usage as well transportation habits and biology diversity. (Umhverfisvísar Reykjavíkurborgar, 2009) These along with good promise were

to give Reykjavik a place in the final for the European Green Capital awards in 2012 and 2013. (Græn borg Evrópu, n.d.) Reykjavik did not win at this time but being among the last 6 in the "competition" was a great honor and an indicator that much has been gained along the long road to sustainability but a lot of work is yet to be done before Reykjavik can proudly say it is a sustainable city.

> *"The problem with indicators (whether for guiding sustainability in cities or for managing a business) is that they are not always linked to a process that can lead to improvement in the indicator. If they are just for public relations purposes or individual motivation, they are not going to work very well. They need to be tied into policies and programs that can create some potential for improvement for the whole city"* (Newman and Kenworthy, 1999, p.18)

In these matters the municipality has done right in keeping the indicators relatively simple, few and scaled-down so they are understandable but yet extensive. Until I am proven wrong I am afraid of that the indicators that Reykjavik municipality is monitoring are not, like Newman and Kenworthy (1999) here above pinpoint, related to any policies but rather linked to publicity agendas of the city.

4.5.2 Public transport

> *"The total costs of the car transportation system exceed transit system costs by 30 percent to 40 percent and are not paid for by users"* (Newman and Kenworthy, 1999, p.41)

According to Sigurðsson H.(interview, 2011) there are certain opportunities opening for public transportation in Reykjavik. Not only are more people starting to use the network and the cost of operating private car rising but also the State, transportation authority's has published that in next ten years ten milliard Icelandic kroner will be spent, one each year in public transportation. The practice in Iceland is that the State constructs all main roads and through fares but the municipalities builds their own municipality roads. The public transportation network is run by one company, Straeto bs that is a coalition of 7 municipalities in the Great Capital Area and it is run by subsidizes from each municipality involved. By promising to spend these milliards the State will require the municipalities full support and their united understanding concerning estimated transportation projects. In the near future many large transportation projects will therefore be postponed, like the Sundabraut road, but the State also requires that each municipality will onward subsidize Straeto bs. By this the State is imitating the Danish system that has worked so well (Tilraunaverkefni um 10 milljarða framlag til almenningssamgangna á tíu árum, 2011) and according to Sigurðsson H.(interview, 2011) by this the State saves itself some money, during hard times, as a large transportation project is more expensive. In my opinion it was about time that more money is to be used on improving the public transportation as in 2006 the situation was as can been seen in Figure 4-9. Then investments in public transport per capital per year (in dollar) were staggeringly low in Reykjavik, way behind the other Nordic capitals. My additional opinion is that to have an effective public transportation system growing in Reykjavik the State have to start founding the public transportation sector on regular basis not only during rough times and when it works to the State´s advantage. The State has to change its way of thinking and not look at the public transport as a one way of making profit. Now it is time to think of the general public interests and start for real to re-build the public transport sector with united efforts of the State and the municipalities, so it can in the future symbolize the (maybe sustainable) growth of the capital.

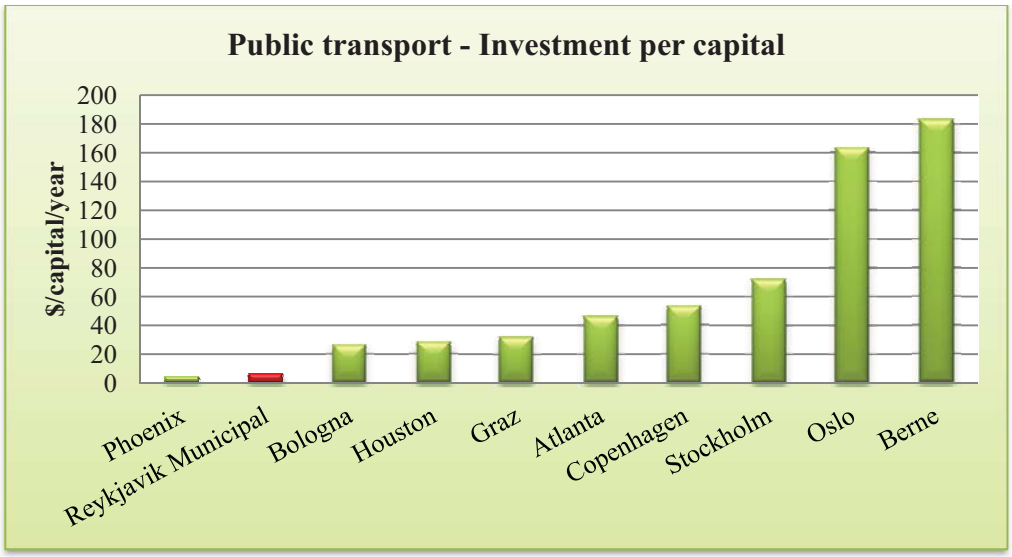


Figure 4-9: Investment in public transport, per capital in 2006 (Samgönguskipulag í Reykjavík, 2006)

As discussed earlier, geography has hindered the horizontal growth of neighborhoods in Reykjavik and still today its suburb´s have clear boundaries. This could be used, without great difficulty together with the New Urbanism approach of Transit Oriented Development (TOD) (see paragraph 0). It could be wise for Reykjavik, with its hardly developed public transportation, to follow the theory of New Urbanism in this matter and develop a highly functional TOD system. This could give rise to new sustainable approach in the municipality, methods that would gain the Great Capital Area in the long run. As a system with metro- or train lines would bring about great expenses for the city this could almost only be realized by using the existing bus system. According to Newman and Kenworthy (1999, p.88) the "*amount of transit [public transport] service is not as critical as its quality if a city is to attract high transit usage"*. With this they mean e.g. that only adding more buses to the existing public transport system is not enough to get people to choose the buses instead of the car. More advanced measures are needed, like more rapid transport from one neighborhood to another. According to this it could be wise for the city of Reykjavik to build upon the existing bus system by making a miniature model of what has been called Bus Rapid Transit (BRT) system and has been used in e.g. Bogotá the capital of Colombia with great success. There the system goes under the name TransMilenio and some refer to it as a "surface subway". This system consists of mainlines, large express buses, that follow the major through fares of the city in separate lanes and then small buses, free of charge, that go through the neighborhoods and collect people and feed the mainlines. This model costs ten times less than a traditional subway or train system and in Bogotá case it transports every day 1.3 million people. (Bus Rapid Transit: Bogotá, 2008) Additionally Newman and Kenworthy (1999) pinpoint that cities will recover faster (its Government costs) from public transportation costs projects by using transit-oriented structure. According to Sigurðsson H.(interview, 2011) the city planning department wanted to start some kind of system where the buses would have the main role. By doing so the transport lines of the buses would have to be included in the Master Plan of the municipality and major changes thereabout would mean going through publication according to the laws. By that people could finally start to choose where to live according to where good transportation possibilities were, i.e. a similar system as in Denmark where people can choose the location of home and work according to how good the transportation possibilities are. This is highly sustainable and in the spirit of TOD of New Urbanism. In Reykjavik, Straeto bs can change its routes whenever they want and thus people are never secure that the public transport opportunities they have today will exist tomorrow.

According to Sigurðsson H.(interview, 2011) Straeto bs does not want to be bound by the Master Plan in where their bus routes lies that is the prerequisite for such system and thus all negotiation has failed. Once again an individualistic approach of one firm stands in the way of the progress of a whole region.

But what is it with Straeto bs, why does a company that is run by all the municipalities involved set itself against improvements that in my opinion are highly efficient and would improve the transportation opportunities inside the city and all the municipalities involved. An independent assessment that was made in 2006 revealed some great flaws in the way the company was administrated and managed. The assessment revealed that the company is managed with no apparent goal or aim regarding e.g. service quality and the system routes. Political interventions concerning the company's activities have been considerable and damaging. This intervention has gone so far that the members of the Board are highly influenced by it and are in no way capable of making independent and professional decisions. These interventions are thus highly harmful to the company and that undermines the confidence of the customers and is harmful to the company's image. Additionally the ways the company is subsidized by each municipality are flawed as it creates suspicion and conflicts between different members of the Board as each municipality will benefit from having as much of the company´s services in its own municipality and thus as little service in others. A complete solidarity and integrity between members of the Board does not exist and it is highly reflected in the company's bus schedule, how it was made and executed. (Strætó bs, 2006)

So corrupted forces of the society also have their fingers in the public transportation system but still there is a functional (barely) system in the city and that does not explain why so few use it. What have been needed in the society is to change people's attitude towards public transportation and the usage of the alternative modes, walking and bicycling. The inefficiency and boringness of the bus system has lead to very slow increase in the usage of the city buses and the general public has not has the will to change as blooming times have been facing them the last decades.

4.5.3 Automobile dependence

People are getting used to having two cars each household where everybody has guaranteed parking space in front of their house, workplace, grocery store, gym and other general service. The State and the municipalities have supported this behavior by constantly facilitating the private car by building and rebuilding more roads. In my opinion this has gone too far as "taking the car" from an average Icelander would be like taking a lollypop from a child, they would not understand the damage it does to their teeth's and health and the care that it is shown to them by taking these measurements.

Today it is a known fact in the academic world that by constantly making new roads and widening roads will never help cities congestion problems. The hunger after better transportation facilities that facilitates the private car will never be satisfied as according Duany A. (2006) *"traffic will grow to fill capacity"* and *"traffic is a constant, and it is not solved, and never has been solved, and cannot be solved by the buildings of highways"*. According to this a change of transportation habits and shift in the mindset of the inhabitants is needed instead of more "traffic solutions" in the battle against automobile dependence. I said in this study's project formulation that the mindset of Icelanders has been corrupted throughout the years as everyone's dream has been moving to the suburbs to a single apartment house, preferably with a green garden on all sides with a panoramic mountain view and few parking lots where the degree of social contact can be chosen. This mindset

is a very automobile dependent behavior but to some degree it is understandable as the city has as well been constructed around social status. (this will be better described in paragraph 4.7)

Additionally people's acceptance of the car and what it brings to the society is in my opinion frightening development. According to Newman and Kenworthy (1999) traffic death- and accident rates are highly linked to a car usage in a city (though other factors like traffic regulations, traffic engineering, management etc. also play a role). This is apparent in Reykjavik, as there are more cars in Reykjavik municipality the hazard of travelling inside the municipality boarder is higher than in other municipalities (the same could be said about the municipality traffic related air pollution). As said in 3.2.4.3.4 Accidents and injuries most traffic accidents and injuries in The Great Capital Area happen inside of Reykjavik's boarders and people are just accepting this as a consequence to having more freedom getting around in their private cars. On the main routes, when going out of Reykjavik, there have been extensive campaigns going on where the toll of the rural highways in form of deaths during each year is presented. This has been done in the form of where crashed cars are put upon a pedestal where a large number is hanging that indicates how many have died at this time of place. This is all good as the rural highways claim most death tolls but in my opinion this should also be the case when one were about to enter Reykjavik municipality, there should be a similar pedestal that indicates how many have been injured due to the traffic development of the municipality. Reykjavik municipality or other municipalities for that matter have not had many campaigns running that indicate the destructive force that we create by being so dependent on our cars.

It is vital for the sustainability and the quest of overcoming automobile dependence to keep the future urban development inside the present boundaries, both for Reykjavik as the Great Capital Area. This will not be done if the municipalities will keep on competing by the rules of the free market concerning occupation- and residential areas. The urban structure of the Great Capital Area is one that makes a good setting for future urban development. The Urban development only started for real about 60 years ago and has not gotten to spread too far into the countryside. Distances in the area are still relatively short and congestion problems are not as severe as in many automobile dependent cities of the world. All municipalities have relatively concentrated center of occupation or down town area and that alone gives great opportunities for Transit Oriented Design (TOD). Occupation areas that spread themselves over the whole city are worse than those that lie very central as to service that kind of system with bus routes and bicycle paths is way harder than when it is concentrated.

All municipalities, though Reykjavik is leading the eyes of the general public, are opening up for the alternative means of transport. The administrative authorities are also opening up for sustainability with their "after crises" attitude and hopefully this attitude will be a permanent one. By the now published municipality's policies and bicycle culture (see paragraph 3.2.4.2) Reykjavik has taken one step in coming more sustainable but only a baby step has been taken towards making the Great Capital Area more sustainable. Still about 50% of the built area is under transportation and transport related facilities and ecologically and socially the whole automobile system is bad for the society. Only collective measurements can reach sustainable solutions and that is not to be found in the Great Capital Area. To fight automobile dependence the modal split has to be bent in the will for public transport and softer modes of travel. There is thus needed to facilitate new public transportation network and culture for cycling. The main arteries are in place for new public transport network if it is to follow the one like in Bogotá in Columbia described here above and therefore a determined will of the administrative body is needed.

4.5.4 Need for changed attitude

It is not just the inhabitants of Reykjavik municipality and the authority body that have to change their way of thinking as the same could be said about the municipality companies. I have already discussed that grocery stores do not provide facilities for those who would want to do their shopping on their bikes. Now I want to discuss another matter that is the retail shops, restaurants and cafes and for that I will take the old City Centre neighborhood. Since the opening of the Kringlan shopping mall shop owners there have been worried about their future existence but still this neighborhood's shop structure has kept its original shape throughout the years. More restaurants and cafes have emerged on the scene and the liveliness of the neighborhood has not been as much for several decades. These neighborhood shops are mainly linked to one street, Laugarvegur road that ends in the very centre of the old town. This street resembles in many ways what the city of Copenhagen has in their main shopping street "Strøget". One of the main resemblances is that through this shopping street, cars are allowed to drive. But this resemblance could only be realized in 1962 as that year the city authorities of Copenhagen decided to alter Strøget to a pedestrian-priority street. In 1962 the same skeptical questions were asked as is now being asked in Reykjavik 50 years later, will a project like this really succeed so far north. In Copenhagen it has shown to have worked and today the city's liveliness factor is more than ever *"the project was enjoying greater success faster than anyone had anticipated"*. (Gehl J. 2010, p.13) According to Gehl J. (2010) and Newman and Kenworthy (1999), that by inviting people rather than cars into a city, pedestrian traffic and city life will increase correspondingly. This is despite of climates, culture and different economies and social situations. This, the city of Copenhagen and cities located far north, like capital of Norway, Oslo have proven. Despite of this most of the shop owners in the Laugarvegur road were in 2006 against the road being turned into a pedestrian street. Many of them simply didn't want to lose the parking space in front of their shops in fear of losing customers. Their argument was the same as ever, the weather is too bad for walking and bicycling, that the Icelandic culture of using the car is to far grown into the culture and Icelandic customers would never walk their t errands and that it would bring "death" to the Laugarvegur road and their shops. (Randversson, 2009). Fortunately last year experiments have challenged this old way of thinking in the City Centre. Temporary experimental projects during the summer of 2011 breathed new life into this debate. During the summer months of July and August the Laugarvegur road were partly converted into Pedestrian Street. (Satisfaction with Laugavegur being a pedestrian street, 2011) Alongside this ran another project called "Square in Adjourned Position" (Torg í biðstöðu) that was a project founded by the city but executed by individuals or interest groups. Its aim was as well to attract visitors and inject the old City Centre with live. (Borgarsýn, 2011) These projects showed the shop owners that more people visited their shops during the project period than before and people were pleased with this initiative as now they could visit the old City Centre often due to there now being more people and better atmosphere in the city Centre.

Figure 4-10: Laugarvegur retail street. T.L. in normal day (Hersveinn, 2009) T.R. when pedestrian street (Satisfaction with Laugavegur being a pedestrian street, 2011)

4.5.5 Bicycling

In paragraph 3.2.4.3.7 Bicycling and walking I mention that *"the city authorities seem to have overlooked this great mean of transport in its urban development that has resulted in that today bicycling is not considered as a realistic way to get around on daily bases"* as a result I mention that *"the inhabitants are developing bad habits about daily motioning and they are getting more and more addicted to their cars"*. According to my findings in paragraph 3.2.4.3.3 Travel pattern of those who are most willing to take the bicycle or walk their errands are the ones that live on the west side of Kringlumyrarbraut road, i.e. those that live in the more older and denser neighborhoods that are closes to this center of service, administration and business (see Center of National Interest in Figure 3-44). People tend to choose the car more often if they live in other neighborhoods as people's willingness to take the bicycle or walk decreases with increased travel length.

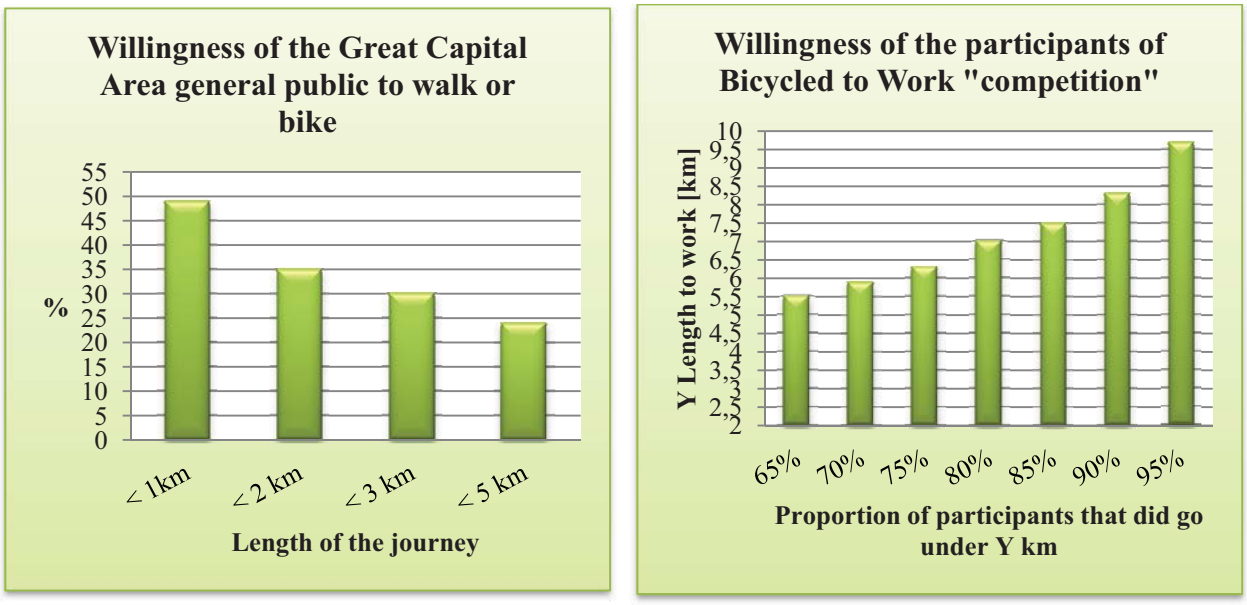


Figure 4-11: Willingness for bicycle and walk (Hjólaborgin Reykjavík, 2010)

Figure 4-11 illustrate that about 50% of the general public of the Great Capital Area could believe themselves to choose to bicycle or walk when journeys are under 1 km. As journeys are under 5 km the interest starts to diminish, i.e. the possibility that people chose to bike or walk instead of taking

the car increases with decreased travel length. The same can be said about the participants of the campaign or "competition" "Bicycle to work" that The Icelandic Sport Association has launched for several years in association with the city companies to urge people and groups to take the bicycle to work instead of the car. Most participants are willing to bike about 5 km but when the journey to work gets to be longer the enthusiasm fades out. According to this a journey may not be longer than 5 km so people find it realistic to bicycle or walk. Figure 4-12 puts this in perspective to Reykjavik municipality.

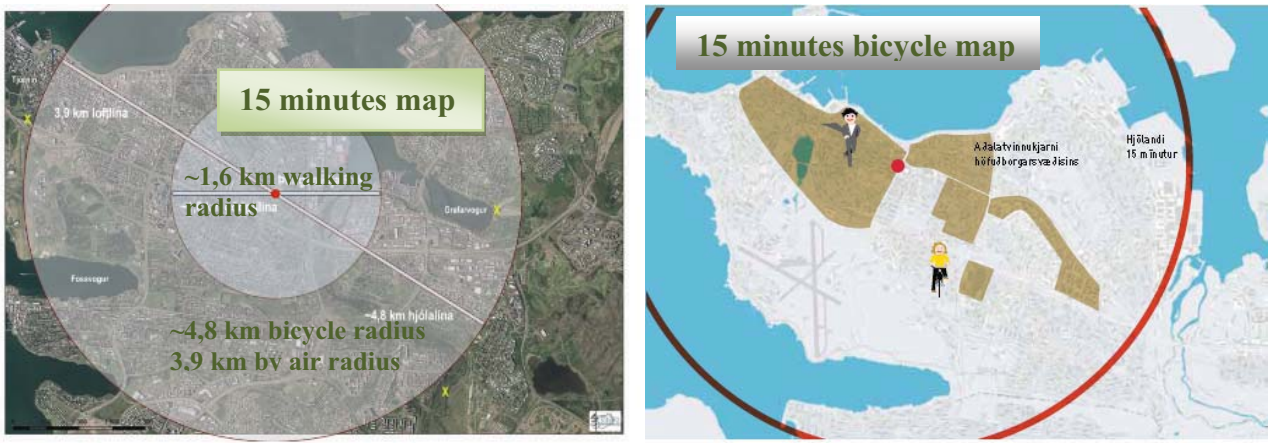


Figure 4-12: "15 minutes map" for Reykjavik. T.L. from center of residence and (Hjólreiðar, n.d.) T.R. from center of occupation (Hjólaborgin Reykjavík, 2010)

In 15 minutes on a good day, one can travel about 5 km on a bike. Thus if the starting point is the center of residence one can cover, according to Figure 4-12, large part of the municipality. If this 15 minutes circle is to be drawn from the center of service, administration and business district then the part covered is not as long as before. To decrease travel length when choosing the bicycle it is necessary to have bicycle lanes attached to the main roads and through fares of the municipality, but as it is for now most bicycle lanes are designed strictly for recreational purposes and most of them lie with curved lines and some are used for both walking and bicycling. According to Reykjavik the Bicycle City (Hjólaborgin Reykjavík, 2010) the bicycle network consisted in 2010 of 10 km of paths and lanes, the aim is to fivefold this length by 2015, tenfold it by 2020 i.e. in the year 2015 the aim is to have 50 km of bicycle paths and lanes and 100 km in the year 2020. These are ambitious goals and according to Sigurðsson H.(interview, 2011) they are not realistic and only by using the existing path system, bicycling inside the municipality boundaries could increased considerably before the network would start to bend. He adds that bicycling inside the municipality is a movement that will only grow in coming years and that the city administration will support. People are starting to alter their way of living both because of increased transportation costs but also because there is more focus on physical health and ecological welfare.

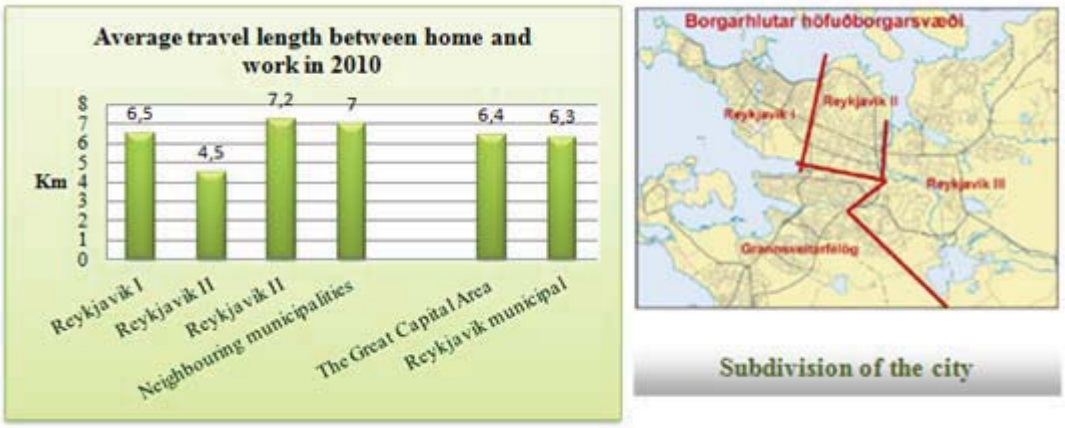


Figure 4-13: Average travel length between home and work in 2010 (Könnun á ferðavenjum sumarið 2010, 2010)

Everywhere in the municipality and in the Great Capital Area people and companies are getting more attentive about their own health and the demolishing affect the car usage has on the environment. As said the Icelandic Sport Association has for a few years run a campaign and "competition" that is to urge people and groups to take the bicycle to work instead of the car, some companies even have standing bicycles for their employees to run errands instead of cars. (Hjólaborgin Reykjavík, 2010) The municipality administration has been running experimental project for facilitating bicycles, projects like where to put and if to put bike shelters in Reykjavik. (A new mobile parking shelter for bikes in Geirsgata, 2011) The municipality has also been a participant in events like European Mobility Week that is to raise the awareness about the use of public transport, cycling, walking and various modes of transport in cities. (About, n.d.) what is left standing is that still today the average travel length from work and homes of the inhabitants in the Great Capital Area is 6,4 km (little higher than in Reykjavik, 6,3 km). That means that the number one factor for congestion problems in the city, the morning and afternoon traffic when people are going to and from work will not be that much affected by increased bicycle usage. In my opinion that is because the main occupation area of Reykjavik municipality and the Great Capital Area is still located too far from people's homes and is way to compact at one location in respect to how far the urban sprawl have reached. Too many are living too far from their workplaces in Reykjavik and until today the city authorities have been putting way too much emphasis on having main service, administration and businesses within this central location. The 15 minutes map in Figure 4-12 is said to reach to about 70.000 people (Hjólaborgin Reykjavík, 2010), what about the remaining about 60.000 people in Reykjavik municipality or the 130.000 in the Great Capital Area. In my opinion the city should start to think of alternative ways and rethink the bicycle network as a part of larger network. Not everybody wants or are able to bike 5 km every morning but some might been more keen to bicycle for 1 km to the nearest public transportation route if there would be good facilities waiting for people and their bicycles. The idea would then be that one could bike to the nearest main route of buses where one could keep the bicycle in a safe storage room and continue the journey to work by buses. This is not possible today as at the waiting shelters there are no facilities for bikes and little shelter for people from the elements of weather, this is the reality both on main routes and secondary routes today in Reykjavik.

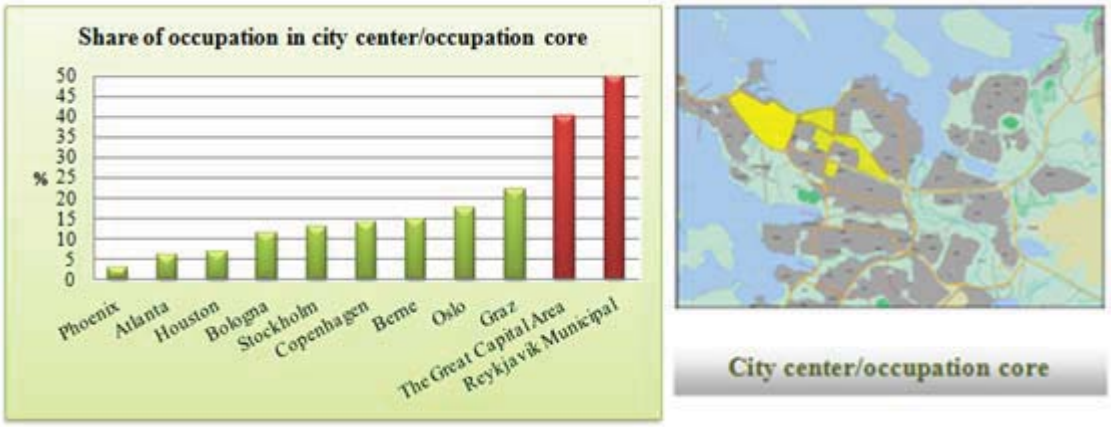


Figure 4-14: Share of occupation in city center/occupation core (Samgönguskipulag í Reykjavík, 2006)

Off course the city administration has some focus on this development as according to Sigurðsson H.(interview, 2011) the plan is to densify the City Centre in the next 20 years or so by infill's and building up the new neighborhood at the old airport area and making transportation improvements so more homes can be located near or the access will be improved to this occupation center of Reykjavik municipality. He also reckons that the east part of the center of service, administration and business area will strengthen in coming years in the form of office buildings and then the Skeifan area and especially the Artunshofdi area will get a key role. I think the aim of the city authorities is to keep most businesses, service and companies well inside the core of the city to have the city not to expand more. That is maybe not in the spirit of New Urbanism as New Urbanism approach is to get the work places nearer to homes meanwhile setting an end to urban sprawl. Reykjavik has for now put an end to urban sprawl of the city and then time will only tell if the officials and politicians of the future will be strong and firm enough to stand their ground when developers and inhabitants want once again to expand the city boarders.

What is left standing is that a bike culture is not to be found in Reykjavik or in Iceland for that matter. City center bicycle are not to be found and there exist only about three bicycle shops. Small workshops are not to be found like the once that are on every corner in e.g. Copenhagen. Bicycles can be bought at other places like supermarkets and few specific types of bikes in larger sport stores. Without having researched it is possible that bicycles are too expensive in Reykjavik, and subsidizes or lowering of import taxes are needed.

4.5.6 Codes influences

According to Reykjavik's Transportation Policy (Samgöngustefna Reykjavikur, 2006) in each journey taken by car there are only in average 1,2 persons in the car. About 19 people die and about 1500 are injured in Icelandic traffic each year. (see Appendix 3: Transportation numbers) Congestion problems peak two times daily, during the rush hours in the morning and afternoons. (see 3.2.4.3.3 Travel pattern) Discussion about "flextime" and different starting point of businesses of the City Centre have erupted and combined with, car-pulling (Carpooling in Iceland, n.d.) and car-sharing (flex-cars) (Sveinsson, 2012) these are mentioned to help the congestion problems. People are thus getting more familiarized about different means to be taken to solve the problems. What is more hidden from people and understandably not as many have knowledge about is how large part codes have on how car orientated a city becomes. Transportation facilities, roads, parking lots, walk- and bicycle paths and associated safety and sound protection areas between and on both side of roads cover 48% of Reykjavik's urban area (see Figure 4-15). To take an example then, according to the codes would a 3500 m^2 one story office building need to have 100 parking lots i.e.

1 parking lot each 35 m^2. This means that about 2500 m^2 asphalt would be needed for the whole office building, according to 25 m^2 areal for each parking place and on that adds the road network that is needed to feed the building. So buildings like that (just in one plane) acquire, according to the codes, transportation facilities that are70% of the ground floor of the building. According to my finding in paragraph 3.2.4.4.4 Share of transport the older neighborhoods near the City Center don't have these problems in the same degree as the newer neighborhoods with more eastern location in the municipality. The old neighborhoods were apparently not affected by codes in the same degree as the newer neighborhoods. According to Duany A. (2006) codes are very bad when it comes down to having mixed usage neighborhoods as codes intend to facilitate single usage. Duany A. (2006) adds that past generation of planning has resulted in neighborhoods of single usage, that are not ugly but they just do not work, *"the heart of the problem is that in the end this [single usage of neighborhoods] cannot be sustained"*. If the heart of the New Urbanism, mixed usage, is to be gained in cities the codes are in need of some re-thinking as like the codes are today in Reykjavik and in many parts of the Western World it is almost impossible to reduce the share of transportation facilities.

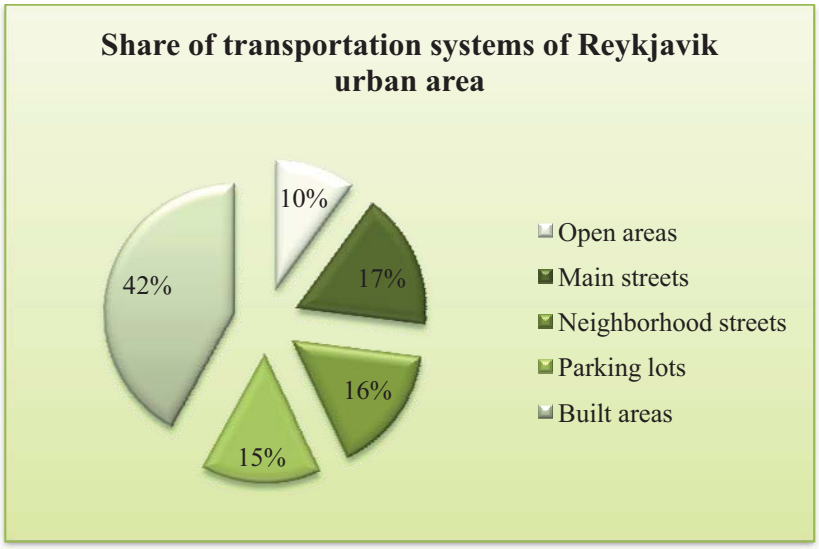


Figure 4-15: The large share of traffic facilities in Reykjavik (Skipulags- og byggingarsvið Reykjavíkurborgar, 2004)

4.5.7 Changed behavior

I share the same opinion as many that a certain generation shift is occurring in Reykjavik and in other municipalities for that matter. This generation is a generation that does not see the great advantages of the suburban life, a generation that sees the quality in a more central location with shops and services at hand. Generation that sees the beauty in being able to step outside their apartments into a lively neighborhood where one can get a cup coffee in with good company instead of making it themselves at home. Education processes are also getting longer and people are getting older and that increases the lifelong need for social contact. Students and older people are in great need of social contact to stimulate and feel appreciated and these are often the ones with least economic resources. These two groups count for approximately one third of the population of Reykjavik. [see Appendix 2: Iceland in numbers] Additionally, there are social groups that cannot afford to live the suburban life with all its costs, car dependency and energy usage.

Suburbs will never disappear and the desire for suburban living will never been fully tamed. It can be controlled and with increased global awareness hopefully the majority of people will start to see the benefits and the beauty of the urban life and thus cities will "automatically" seek more inwards.

One cannot force another to live life in a more compact city but in the future, this possibility could and should be one part of the greater picture. A realistic possibility for more compact living is indeed sustainable as it does not decrease the ability of future generations to meet their own needs. To maintain, compact and persuade mix usage in the already built suburbs would decrease the pollution effects of a city like Reykjavik and improve the quality of life of its inhabitants. If additionally a strict policy towards urban sprawl is withheld a sustainable solution is at hand.

So the need for more urban living is increasing and many now see the benefits of the more urban living but still not all are convinced. Still a doubt lays buried deep inside the soul of the inhabitants of Reykjavik. How can the current situation be improved and with what means? Is this sustainability just another golden farce or promise from the politicians and officials that is made to benefit their own need in the end, and fill their pockets even more so they finally burst at the seams?

The best solution and the most effective one is to show the inhabitants in a direct manner how things can be improved. Make a showcase, alter one neighborhood and show that it will flourish and grow in sustainable manner. Show that its future inhabitants are satisfied and fulfilled with enjoyment over this alternative way of living. Show the inhabitant's fulfillment for their new neighborhood expansion of choices instead of expansion of limits as is more usual in existing neighborhoods.

As said then Reykjavik's municipality pattern of satellite suburbs provides a great foundation to utilize the theories of New Urbanism. Artunshofdi cape is one of those neighborhoods that shall be rebuilt and redesigned in the near future. Once located at the urban fringe, now situated well inside the city boarders it has all the abilities to be a great showcase for Reykjavik in their quest for becoming a more sustainable city.

4.6 The rebirth of Artunshofdi cape

Figure 4-16: Artunshofdi cape (Hjaltested, 2011)

The need in Reykjavik is evident as the south-west corner of Iceland is estimated to continue to be the main population growth area of the country until 2050. (see Figure 4-17) (Sigurðsson H. , Nýtt aðalskipulag til ársins 2030, 2011) Reykjavik being the largest municipality (in the Great Capital Area) will take in much of this population increase and to do so some key areas are needed inside the municipality boarders as the plan is to dense and seek inwards, that 80% of the future developments will be infill or intensification projects. There are few areas in Reykjavik that have the same opportunities as Artunhofdi cape and therefore, according to the new Master Plan 2010-2030, the area will serve as a key area to serve the near future urban development. (Sigurðsson H. , Nýtt aðalskipulag til ársins 2030, 2011)

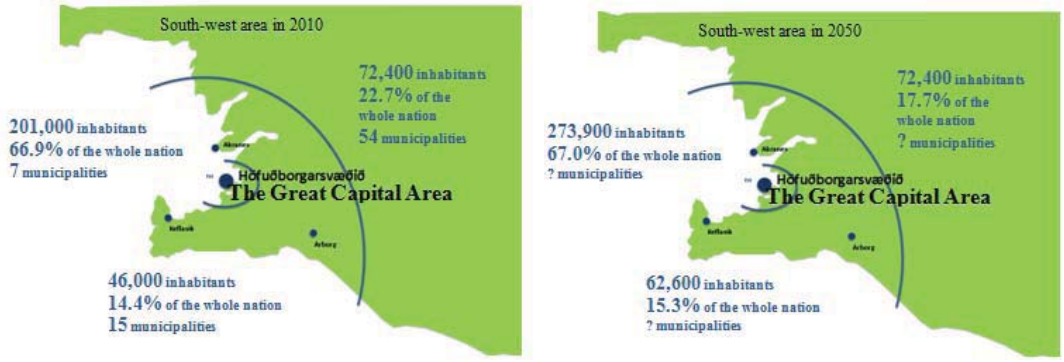


Figure 4-17: Population increase according to medium predictions (Sigurðsson H. , Nýtt aðalskipulag til ársins 2030, 2011)

As mentioned, then in my opinion the Artunshofdi cape area should be used as a showcase in showing what can be accomplished in a city when high-quality planning practice in combination with good intention and sustainable goals are employed. The vitality of the project is to rebirth the confidence of the inhabitants over the planning practice in Reykjavik as well its political actors. That this administration "cocktail" has in fact the ability to help a city like Reykjavik out of their crises of automobile dependency and bad functioning system of public transport and thus initiate a change in the modal split (travel pattern) towards usage of more softer means of transportation, bicycle and walking.

Another vital aspect of the project is the area's central position in the Reykjavik municipality as well in the Great Capital Area. As seen in Figure 4-18 the area has a position not far away from both the center of residence in Reykjavik municipality as well as the Great Capital Area. On a bicycle one can reach a large part of the built area of the Capital Area in just 15 minutes including a large part of constantly growing center of occupation, service and administration. But the vitality of the area is not only how far one can reach from the area in 15 minutes by bike but more how many can reach the Artunshofdi cape from their homes on bicycle. This makes the cape an important source of occupation in the near future as according to my findings in paragraph 3.3.3 Municipality plans it is thought that only in this part of the cape there will be around 100.000 m^2 employments areas in the future.

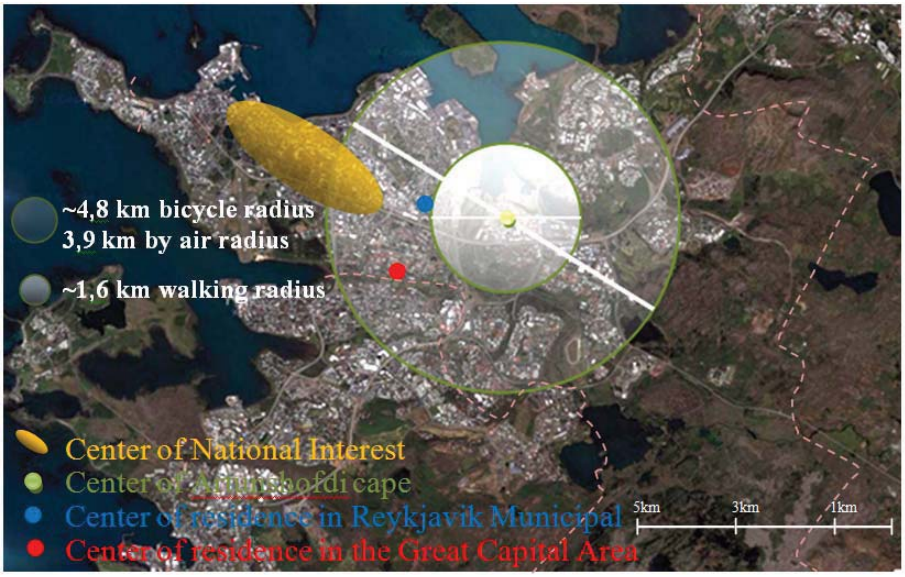


Figure 4-18: Central position of Artunshofdi cape (Já, 2012)

If the Artunshofdi cape area is to have a mixed usage in the future one living in the cape could reach to all services and shops by foot in less than 15 minutes. Additionally the area could serve as a great hub for homes with more eastern location in the municipality, thus making the area lively by inviting people to come and do their errands there instead of seeking deeper into the municipality (to e.g. Skeifan area). The intentions should not be to make the cape into an isolated hub or another Satellite neighborhood. This hub should be linked to the heart of the municipality and as such serve as one "organ" of many in the "city body".

Reykjavik's and the Government, the State, has turned their attention to the imminent problem of car dependency and the relatively isolated location of the municipality main occupation core to the center of service, administration and business. This area is in a need to get more eastern position so it gets closer to the more geographical center of the Great Capital Area. By having this core reach more to the east, work places are brought nearer the homes of the inhabitants and more efficiency and in the end, more sustainability is gained. This development will take time, but this the Reykjavik's administration seems to focus on. As mentioned in paragraph 3.3.3 Municipality plans and showed in Figure 4-19, Reykjavik administration wants to make a new transportation artery. This artery would, if realized, run from the city center along the main ridge of the occupation core and to the outskirts of the main populated area of the city and thus release some of the pressure of the main artery, Miklabraut road. By this, a linkage between the Artunhofdi cape and the heart of the municipality would be realized.

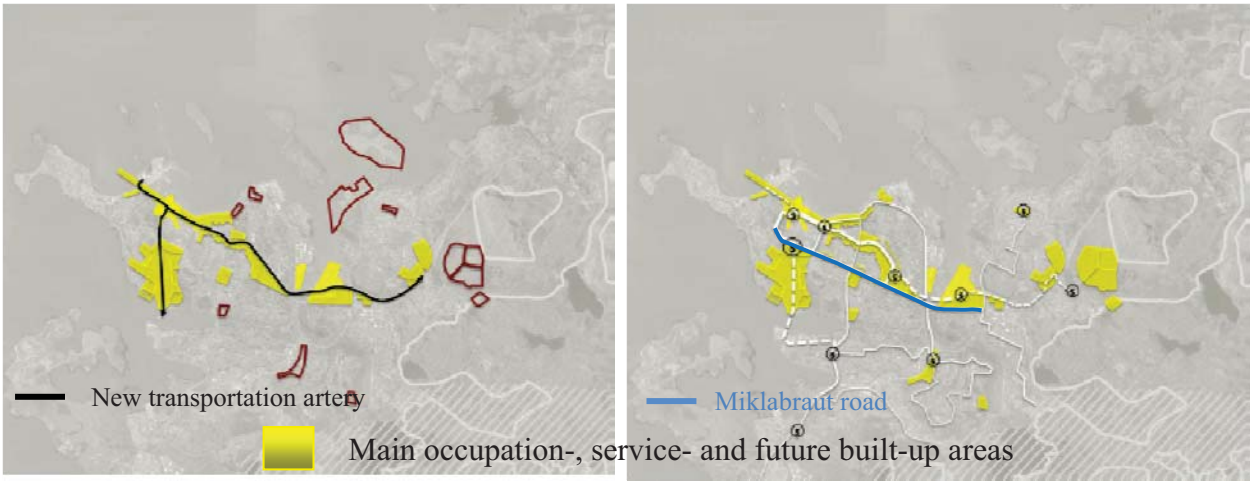


Figure 4-19: New transportation artery running through the Artunshofdi cape (Sigurðsson H. , Nýtt aðalskipulag til ársins 2030, 2011)

The design of this planned new artery has not been revealed yet but it is a merger of many smaller roads that give both restrictions and opportunities. It would bring about new transportation facilities e.g. over the Ellidaa river mouth that according to Sigurðsson H.(interview, 2011) could be solely a pedestrian, bicycle and bus lane. This new transportation artery would lay no more than 200 m from the future build-up possibilities in the city as well as many main occupation and service areas of the city (see yellow areas in Figure 4-19). According to Sigurðsson H.(interview, 2011) this is one link in trying to create a system of better public transportation routes that could in the end be incorporated in future Master Plans. This system could then have the possibility to be extended to serve the build-up of the old airport area as well, with possible connection over to the Kopavogur municipality through Fossvogur bay. This plan, of a new artery has been introduced to Straeto bs that sadly does not share the same confidence over this artery possibility as Reykjavik administration. (Sigurðsson H. , Interview, 2011)

In my opinion this new artery is vital so that a sustainable neighborhood can rise in Artunshofdi cape. Only by the existence of this artery, the possibility of living in Artunshofdi cape without even having a car but still have an occupation in the city center is realized. In my opinion the city administration should play the New Urbanism card of Transit Oriented Design (TOD) (maybe in a combination of Bus Rapid Transit (BRT)). The cape should have mixed usage and be linked to the heart of the city by good and efficient public transportation and by that a more sustainable neighborhood is realized and the possibility of turning the mindset of the inhabitants of Reykjavik into a more positive one concerning the principle of sustainability is getting nearer.

According to my findings in paragraph 3.2.4.3 Reykjavik's development in transportation matters it is apparent that the gap between the usage of private car and more sustainable means of transportation is in great unbalance in Reykjavik municipality. Many factors maintain this bad travel pattern, these are factors like economic incomes, preliminary expenses and vehicle operating costs, cost of parking and its availability as well inhabitants attitude towards more sustainable means of transportation and ecological matters etc. In the following I will try to grasp the ideology of the Artunshofdi cape if a sustainable neighborhood according to the principle of New Urbanism is to be raised or re-built in the future. I will try to describe the atmosphere if the area would have Transit Oriented Design (TOD) function linking it to the central city and the administration district of Reykjavik. I have mentioned the importance of looking to other countries for ideas and inspiration when starting a project like the one in Artunshofdi cape and I will freely do that in the following.

4.6.1 My vision

As said design plays a central role when building by the theory of New Urbanism. Design will thus put great character over the cape. At the west edge of the neighborhood the area will merge with the outdoor recreational area of Ellidaardalur valley. By better pedestrian links these two areas will live in harmony as neighbors should do. At the north edge of the neighborhood the closeness to the ocean will be utilized as the marine activities will be combined with residential areas. The idea of the city administration to use the prior design for the Bryggjuhverfi, the Harbor district is a good one for this part of the cape. There have been attempts to create a European atmosphere that consist of small apartments and good public spaces in close connection to the sea. The new buildings in this quarter will distinguish them from the first ones as all parking facilities will be underground. Both low rise buildings and high-rise will be in the cape but attention will be made to utilize the elevation of the cape so a marine view is provided for as many as possible. More greenery will characterize the higher grounds of the cape and in-between the building will be medium size parks and squares, linked by pathways that have natural shapes and curves that allow them to agilely spin a web around the buildings. The parks and squares will invite visitors and inhabitants to sit down and enjoy the local climate that due to design will embrace the sun and provide shelter from wind. Additionally, ground floors of many building will be reserved for small retail shops, grocery shops, bicycle workshops and such and automatically make the life between the buildings more vibrant and pleasant than is the custom in newer neighborhoods of Reykjavik. Small neighborhood shops will thus be in close relation to residential areas and office buildings.

To increase safety and usage, the paths will have good lighting and lead to the main service, shops and work places. To increase the usage and the harmony of the more sustainable means of transport bicycle lanes, walk paths and public transport routes could like it is in e.g. Denmark be a priority when it comes to removing snow as these are the one that has the largest transport capacity. The

paths could e.g. have ground heating to further facilitate their usage and mark their importance as transportation routes.

The upper part of the cape will have a more administrative look to it. There the main businesses and workplaces of this neighborhood will be located. Here some high rise office buildings will be built in close combination to lower houses. At the east and south edges the main corridors for those who desire to enter the neighborhood or leave it by cars are located. Here parking will happen in larger underground parking facilities the parking in the neighborhood will be highly restricted. Cars should only been allowed into the neighborhood at low speed as pedestrians and people on bike will be a priority and some part of the area shall be completely car free. Car-pulling will be familiar to the cape inhabitants and many will use the flex-cars hubs that will be located at a few places in the cape.

The already mentioned main artery will be apparent and respected in the neighborhood. It will be the one that injects life into the neighborhood as well transporting inhabitants on their way to work or pleasure in the heart of the city or for the ones that seek comfort in the rural uplands of the municipality. In the neighborhood there shall be one large bus waiting terminal. It will be located on the borderline between the employment area of the cape and the residential area. There the facilities for bicycles and users shall be as it is nowhere else in Reykjavik today. Again inspiration shall be taken in foreign examples as well as the needs of the inhabitants of Reykjavik, as they are the ones that know the need. The whole bus system of this artery shall have more the appearance of a subway system in many ways and for many reasons, there weather plays a huge role . In Artunshofdi cape as in the rest of this main artery, waiting stations shall have multiple functions. There the possibility to change clothes or store bicycles shall be good and mostly inside to shelter from the elements. There one will also pay for the fare and have the possibility to purchase some snack. When buses arrive, people will have the opportunity to walk inside all the doors of the buses as one has already paid for the fare. Stepping aboard will be in the same plane to facilitate the elderly and handicapped and to speed up the process. This can both be with an elevated runway or low-rise buses as the custom of the Bus Rapid Transit (BRT) system. Buses will drive in separate lanes that gives them more speed and a high reliability. Buses arrive and depart every couple of minutes during the rush-hour and on weekends. This will mark the foundation for vibrant restaurants, cafes and market atmosphere as these are now not solely bound to the old City Center. Thus a pedestrian street with cafes and shops will have its starting point in this waiting terminal and cross a large part of the cape. This street will interplay with the main shopping street of the old City Centre and serve as a buffer between the two areas of the cape, residential and employment. The new transportation artery and the pedestrian street will give tourists the opportunities to come and visit the suburbs. The cape area will thus in the end give good contrast to the old City Centre and thus give increased variety for inhabitants and visitors of the city. In the end these measurements will endow the municipal and the whole Great Capital Area with more livability, better economy and improved ecology and increase thus its sustainability level.

4.7 Present attitude and future visions

What the future will bring about is hidden and thus everybody can freely predict and speculate there about. In my approach to this study and with a hope of achieving some learning I have talked to a group of friends and family and asked them about their attitude towards sustainability and the present social and economical environment they find themselves in. The same I have done about their visions about the future and these along with my findings in the two books, After the Car and Sustainability and Cities: Overcoming Automobile Dependence will mark my findings about the present attitude of inhabitants of Reykjavik and future visions for urban development of the

municipality. This is meant as a closure to my discussion that will then lead to the conclusion of my study.

4.7.1 Present attitude

Throughout my study I say that the mindset of Icelanders has been corrupted throughout the years as the city has been constructed around social status, a certain "snobbism". I also indicate that the general public has been confused in recent times and does not know which way to turn when dealing with the sustainability concept. These statements and indications of mine are in some way linked to the discussions that I have had with friends and family back home during this study period and thus in the following a few of them will be described.

When discussing future plans and economics my brother told me that maybe he just has to accept that he will always be a complex or an apartment building "type". He lives with his wife and two children in an apartment at the ground floor in a terrace house with separate entrance door and a little private garden embraced by huge public green area, close to his kid's school with two cars in the household. In his mind this was not enough although he had better life then most others in the world.

My friend, when coming back to Iceland from studying abroad in Sweden chose to try to live the same live as she did abroad i.e. by not owing a car. Her little uncles and cousins called her the "crazy" aunt that did not have a car, the aunt that always came on foot or had to be picked up when invited for family gatherings. At young age these did not know anybody that did not have car but still carried a driving license.

Another friend of mine got rather frustrated when talking about sustainability as he wanted to have the ability to take the car wherever he needed to go so he would be able to spend more time with his family. He did not accept my explanation that this was not about taking his only car away it was about bringing service, shops and workplaces closer to his home so a decrease in driven kilometers could be gained and better climate could be brought over the city so he and his daughter could have great family time by taking the bicycle together to the grocery store and that he could spare some time going from work and home by better public transportation. It was not that this friend of mine was not getting the benefits and not understanding my words it was just that he did not believe in what I had to say or that this could ever be done in Reykjavik.

This is why I say that the mindset of Icelanders has been corrupted throughout the years but that I do understand, as the city has been constructed around social status. There is a packing order in the city, a certain "snobbism" that follows you everywhere. Everybody are trying to get that house at the hill top and those that choose not to and want to live in the City Center are considered abnormal, we even got a name for them "City Center Rats".

These above findings about the present attitude of my friends and family give me reason to worry about the future. These findings describe a way of thinking that is deeply grown into the general public in Reykjavik and thus shape the society and their visions of the future.

4.7.2 Future visions

Most agree that this century, the 21st century, will bring about huge changes to the urban environment. In what way and how is up for debate as not everyone has the same opinion. In my circle of friends and family I get two types of responses or answers when I ask this question about the future. The first type of responses, that is often related to the female friends is "this is depressing, I don't want to talk about it, it is enough that it is all day long on Discovery channel"

(sometimes I get asked questions in return instead of answers, “are you David Attenborough or what”). The second type of responses, that is often related to the male friends is “the technology will save us, like it has always done, when petroleum is gone a new fuel source will be found or cars will run on atmospheric air”. In these discussions, that in most cases are relatively short (as nobody wants to stay on the subject for too long), nobody mentions that in the future people have to change their behavior and priorities as that alone is a frightening fact. It´s true that technology will to a certain degree save us but will it be done before the world faces e.g. oil crises or climate change collapse. Will the technology perhaps save us in the way that will allow us to be able to maintain our society’s structure but with other means of transport instead of the car as the oil reserve of the world has dried up? Will the technology maybe help us in the way that in the future most people work, travel and meet one another in a virtual world while in their own home? Answers to these statements will not be given here as there are no answers. So maybe my male friends are right that the technology will save us but I think it will not save us in the way they were thinking. At this stage nothing is certain about the way urban areas of the future will turn out to be but what I am certain about is that my female friends are not right in their answer. Some might laugh now and say, are you telling us that you are David Attenborough but that is not what I am going to say. My statement is simply this that we, the society, must start to discuss these kinds of things so a solution can be found. By not discussing things, nothing will change until the system as we know it today will “tip” with more devastating consequences than if a vast discussion had been taken about the concerns at hand so they could be met with more understanding and improved actions.

Both authors of the books, After the Car and Sustainability and Cities: Overcoming Automobile Dependence agrees that the car system as we know it for today will end during this century.

In After the Car, Dennis and Urry (2009) reveal three scenarios for the future. All three are rather depressing views (see paragraph 2.5.1) as in their opinion the alternation of the car system will bring about huge changes to the way our societies are built-up today. As people are not ready to take the measurements needed to change their behavior the system will automatically do it for them. These forced measures will lead people, neighborhoods, societies and nations going head to head in a match that can have no good ending. Rivalry about the last remaining oil resources will tear societies apart or technological improvements will erode the social and moral foundation of civilization as we know it today.

In Sustainability and Cities, Newman and Kenworthy (1999), reveal two scenarios but these scenarios will happen after oil crisis, so they share Dennis’s and Urry’s (2009) opinions that oil crises are at hand. Newman and Kenworthy (1999) give their opinion of how people can act when the oil will start to “fade” out, as it will not just stop at one point. The first scenario is in same manner as Dennis and Urry (2009) mention it i.e. at first governments will deny the real situation. When the truth will come out free people will not change their behavior as they believe that technological achievements will come to the rescue and thus decide to “sit out” the situation. Cities will start to decline and the influences will first be felt in the suburbs as there the automobile dependency is the highest. People will start to leave the cities as shops, businesses and service will stop to work. The old core of cities will survive but just barely as economic decline had so undermined the infrastructure. In their second scenario another picture is drawn that is more positive. In this scenario sustainability is the main theme. Now the oil crisis has passed but it was expected so series of local community-based meetings are launched. The general public is informed about the problems at hand and every actor in the society is intertwined into the solution at hand. Collective measurements are launched where car-pulling, bus systems and trains were improved and the whole transit system was rescheduled. Reduction in traffic were the result from the oil

crises and collective measurements brought people near each other and the oil crises were tackled in a manner that had the least influences on the society.

According to my above findings and believes, the car system as we know it of today will end during this century. It is up to all the actors of the society to choose in what way these changes shall be met and collective measures are needed to diminish its effects but it is clear that the effects will be great. How Reykjavik is going to tackle these changes is totally up to the measures that will be taken from today. What measures Reykjavik should take, in my opinion, will thus be the conclusion to this study of mine about the Sustainable Urban Future of Reykjavik.

5 CONCLUSION

A book once started by asking the question "what makes a good city". This book is called Good City Form and is by Kevin Lynch. In the opening sentence Lynch (1984) presents this question as a "naïve" question. Most people tend to have their own variation of answering this question as everybody in deed know what makes a good city or what is needed to make one and thus the question in the first place seems very naive. Most people agree though that their own city is not the ideal "good city". Lynch's (1984) arguments thus soon turned into how complex this question really is. Most people don't know why they feel this way about their own cities and many believe that they cannot have any influence as the complexity is vast and more dignified forces of the city are in control. Lynch (1984) thus closes his opening discussion by saying that if everybody know what makes a good city the only question is "how to achieve it".

No matter what the agenda or the aim of a project it will never be achieved if not one step is taken back so that the real progress and the greater picture are revealed. This is often evident when looking at city planning, in Reykjavik's case one needs to go abroad and see what is happening there to get more understanding of what is going on back home in Iceland. This is not to say that everything from abroad is better than what is happening at the home ground it just puts it in the right perspective. It is true that the first development steps of Reykjavik becoming a capital area were influenced by students and scholars that had gone abroad and seen the real potentials of Reykjavik (see paragraph 3.2.1). To live and work in an area, with all the influential forces, and then trying to pinpoint its real faults, qualities and possibilities is a hard job which only a few can master. It is thus vital for Reykjavik's planning practice to constantly gain new knowledge in form of new scholars and re-education programs abroad to achieve better city form. This is a shared objective and not a new wisdom.

It is no less vital that the general public gets informed and has a basic knowledge about the task at hand. Only by having the whole society informed, a planning discussion can be followed through. This discussion was what early Reykjavik's planning practice was lacking. The late 20th and early 21st century field of planning has been compensating this lack by making improvements and is gradually opening up for a more open discussion. The result is that participatory planning is on the agenda in today's urban development of Reykjavik.

The two main chapters of this study along with the discussion revealed a number of conclusions and facts in the search for a more sustainable urban future, internationally and in Reykjavik. In the theoretical section the theoretical background of the urban structure in Reykjavik is traced. More generally the Sustainability agenda and the concepts of Compact City (Smart Growth), New Urbanism and Urban Sprawl are introduced and then some speculations and guidances for future urban development is introduced. The empirical section is strictly focused on Reykjavik and the urban and social structure that has managed to develop there. Firstly the urban saga of Reykjavik is traced and secondly the present social-, political-, environmental- and infrastructure map of the city is opened up and laid out and left free for everyone to speculate. As a case study Artunshofdi cape is introduced in the same manner i.e. where municipality plans are revealed and existing facilities are analyzed. The discussion is held out to combine the two main chapter's findings and give a critical assessment and guidance for the urban development of Reykjavik with the aim of finding the right city form for the municipality.

This study has revealed that Reykjavik's growth has been vast in a matter of short time. The urban development practice has thus been forced to mature at a fast pace and this period has not been pleasant at all times. The island´s location, in between two continents, firstly under the wing of

Denmark then faced with military occupation from America during World War II has influenced the urban development practice in two ways, making it not to follow the one nor the other. The first development steps of Reykjavik were thus highly influenced by the European practice but understandably the American practice has influenced the years after the War. Urban sprawl has thus been the main theme since World War II and the municipality has stretched its boundaries further and further each year. Due to this and some geographical circumstances the appearance of the municipality built environment has some distinguishing characteristics. These are that most of the suburbs have still clear neighborhood boundaries and thus the municipality can clearly be divided into different "satellite" neighborhoods. Another distinguishing characteristic of these neighborhoods is that they have low density and all of them can be said to be bedroom neighborhoods as people tend to sleep at these places but work and do most of their daily errands at other places in the municipality. Along with this, public transportation, walking and bicycling has not gotten the opportunity to grow in Reykjavik. This has even gotten so far that to some a real alternative to the private car is not at hand. This in combination with the sprawl of the city has lead to vast automobile dependence of the inhabitants. Additionally Governmental and administrative policies have not showed the general public, that they are to serve, the right respect when it comes down to the urban development of the municipality. Too much energy has gone into municipalities rivalry and party related power struggle and individualistic approaches that have only resulted in distraction and confusion in the society. Additionally this has resulted in the general public having lost all hope and belief in the true intentions of the administrative body of the municipality and thus holds tightly to what they now have, i.e. their cars and good residential properties. All measurements to change the current situation of the inhabitants of Reykjavik are thus met with prejudice and pessimism.

As said in the introduction to this study the Icelandic nation has grown from its origin as a very sustainable nation to a nation that is highly unsustainable in many ways. Sustainability as being a global action provides nations of the worlds collective measurements to tackle the highly different problems that the world is facing. Sustainability takes thus into consideration environmental, economical and social factors, both on a global level as well at local level and by that it can guide nations into more harmonious way of living. Reykjavik is in need of this guidance and therefore sustainability can be of a great help.

New Urbanism, fundamentally, is one tool of many that nations can choose to follow in their quest for more sustainability. Its usage of urban design and Transit Oriented Design (TOD) to gain more compactness and liveliness of central areas could gain Reykjavik in many ways. With the New Urbanism as a spear the municipality could re-vitalize its suburbs by making them into more self independent units or hubs. By this the automobile dependence could be eased and more alternatives could be given to the inhabitants of getting around in the municipality. This could then again inspire the remaining seven municipalities in the Great Capital Area to participate and oblige to the principles of the sustainable agenda. Reykjavik has done right in setting an end to urban sprawl of its municipality and seeking inwards with infill and intensification projects on brownfields, like the industrial area of Artunshofdi cape. Now there is need for facilitating the alternative modes of transport, public transport, walking and bicycling. By using the concept that New Urbanism provides, Reykjavik can once again be planned as a one unit instead of as a central city and suburbs. New Urbanism approach to sustainability can thus give Reykjavik's inhabitants new hopes that could re-shape outworn visions and inspire new land use strategies. Hopefully this will then be the measures that will inspire the rest of the Great Capital Area to be united as a one whole as first then real sustainability measures in the whole area will be gained.

To achieve once again, long-awaited, good city form and answer Lynches (1984) "naïve" question of "what makes a good city", Reykjavik authorities need to resurrect the hope of the inhabitants and their trust of the urban planning practice and the respect for the municipality administrative body. The determined will of the political forces of the municipality is in need of being tested and it is time to bring those forces down from their pedestals to the eye level of the general public. A showcase is what is needed where all the actors of the society jointly re-shape and re-develop the city on an equal basis with a common goal. This common goal lies in sustainability but it seriously means that now the municipality needs to take measures that will help its future generations instead of compromising their future as has been the custom in the past.

In the start of this study a question was asked that was left hanging throughout the research. Its answer was to determine how sustainable urban future of Reykjavik really is. Artunshofdi was revealed as a case and it's re-build should help Reykjavik municipality to see the advantage in sustainability and learn and show the inhabitants what is to be gained by obeying its agenda. The question was:

How can a new land-use strategy in Reykjavik re-shape outworn visions and create new transportation possibilities that lead to less automobile dependency and more sustainability of the society?

My answer is that a pure sustainability will not be gained in Reykjavik municipality the way things are heading now. This statement also relates to the remaining seven municipalities in the Great Capital Area. This is due to the administration visions of the eight municipalities and those of the Icelandic State for the urban development are the ones that are outworn. A new land-use strategy is needed and that not only for Reykjavik municipality but a collective one for the whole Great Capital Area so that sustainability can ever be gained. Only by facilitating a merger of these eight municipalities a sensible collective land-use strategy can be made for the Great Capital Area. It is apparent from my study that this merger is not going to happen in the near future and thus both these visions and the land-use strategy will not change. The same could be said about the transportation possibilities as rivalry between the municipalities in the Great Capital Area is highly damaging as the way the system is run today. Reykjavik and the Great Capital Area is in need of stopping sprawl, intensifying the built area, designing a new public transportation system (bus, metro, tram, train) and tidying up in the authorities body. As the rivalry between the municipalities in the Great Capital Area as well as inter party related rivalry is so deeply grown and almost accepted in the society this alternation and tidying up cannot be done by the authorities of the municipalities involved. The area is thus in a need of a guiding hand and that hand should be a governmental one. The Icelandic State should intervene and lead or demand a merger of the eight municipalities of the Great Capital Area. Only when that has been done a new land-use strategy can be made and these outworn visions can be re-shaped and then the true quest for less automobile dependency and more sustainability can begin.

What vision will reflect in the eyes of my children in the future when they will look out of the very same window that my grandfather, my father and I have been looking out of the past 50 years is unknown. Maybe they will see that the Miklabraut road has grown due to more automobile dependence and due to growing air pollution the visibility of the window will be obscured as the pollution has fasten itself on the outside of the glass. If right measurements will be taken now my children could be able to have clear visibility and the window could be open at all times as now the noise level from the Miklabraut road has diminished due to equalization in the modal split and new public transportation. What the window will frame for the future generations is uncertain but

actions taken today will be the ones that set the foundation for a better future in Reykjavik municipality. I still hope after this study of mine that the city will never reach our cabin in the countryside but still I am not convinced as Reykjavik's urban sustainability is nowhere secured yet.

6 PERSPECTIVE

At the start of my project Trausti Valsson, urban planner and professor of planning at the University of Iceland said to me that I should define and limit my study more. That I did but now about 200 pages later I stand with the question should I have limited it more. I could have kept on writing 200 pages more but every study has a start and an end and this is how mine ended. Morten Elle my supervisor said that I should be thankful for what I managed in this relatively short period of time. That I am but there are many views and visions that I had to rule out of my research. These could make the foundation for more researches for those who show this study of mine interest.

Political conflicts and rivalry put a mark on my report, although these forces didn´t have the opportunity to express or defend themselves. I tried to contact Gísli Marteinn Baldursson who is often said to represent the changed vision and attitude of the new and younger politicians. Additionally he is often referred to as being a spokesman for sustainability and improved livability inside the city boundaries. I, sadly, had no luck contacting him so his opinions had to be ruled out. That brought me though to interviewing Gunnar H. Gunnarsson who is a former employee in Reykjavik municipality and a passionate spokesman for improved transportation facilities inside the city boarders. According to Gunnar there is much rivalry and corruption in the society that the general public has little or no knowledge of. In my opinion this power struggle needs to be brought under control in the future so a common understanding can be brought to the decision making inside the city. That could thus be one researched theme.

Another could be about the role of the Icelandic Government in urban development matters. It is necessary to investigate why the Government, as an authority body, has not interfered and tamed the rivalry between the municipalities. A project could also be about how a merger of the municipalities in the Great Capital Area should be done. The State´s lack of action in public transportation matter is in same manner not clear. Why the State first in 2011 subsidized public transportation is also an interesting subject.

It would also be of a great interest to make a study of how bad the suburban pattern really has been for the general public in Reykjavik. To cast a light on how much the inhabitants health has declined and if this health degradation that Reykjavik is facing today really can be related to this suburban pattern and lack of motion linked to that. It could then be interesting to try to map the sociological and health of the inhabitants of respectable suburbs and those in denser neighborhoods of Reykjavik. The study would thus be about if the people in the older and denser neighborhoods of the municipality, where social contact is more are in general “happier” and healthier than those that live in the suburbs with more open nature but less social contact and the interplay there about. Some findings there could be that the people of the more compact city were actually unhealthier, as such living pattern is often linked to premature drinking or increased cigarette smoking.

What could also be interesting to study is how Reykjavik’s size, as it is today, affects the sustainability agenda, i.e. if the municipality is large enough so that affectivity can be gained in the society. When cities get larger they become more efficient, transport energy use per capita generally declines as city size increases and thus cities become more sustainable. This study could thus try to answer the question if the size and numbers of inhabitants of Reykjavik municipality or the Great Capital Area could by in the way for effective public transportation network to thrive.

Finally and little related to the previous one is an important and exciting study about the public transport system. It relates to what kind of public transportation system is best suited for Reykjavik municipality or more the whole Great Capital Area. Is the Bus Rapid Transit (BRT) like has worked

well in e.g. Bogotá a good solution to the Great Capital Area or should the authorities be thinking more ahead and establish a metro system that utilizes the cheap and renewable power source that the island indeed has. A smaller study could thus also be about how the already established public transport network of the Great Capital Area can be improved so that more efficiency can be gained. To look into the management part of the company and see how it affects the way the system works today, see if this should be an independent company instead of owned by the municipalities involved. This one would thus also look at if the existing bus system could be used as Bus Rapid Transit (BRT) where the main rout could e.g. be the Miklabraut road and their buses would drive in separates lanes with close intervals. Then the study could come to grips with if it could be beneficial to have the secondary buses free of charge and what improvements could be made to the existing payment system so more efficiency could be gained. This could thus also include transformation of the waiting shelters and how the bicycle network could be adapted to these main routes and how bikes could be brought along the ride.

7 BIBLIOGRAPHY

A new mobile parking shelter for bikes in Geirsgata. (2011, november 15). Retrieved march 05, 2012, from Reykjavíkurborg: http://www.reykjavik.is/en/desktopdefault.aspx/tabid-4631/8023_read-29013/

About. (n.d.). Retrieved march 06, 2012, from European mobility week: http://www.mobilityweek.eu/about/

Aðalskipulag Reykjavíkur 2001-2024. (2002, december 20). Retrieved march 20, 2012, from Reykjavíkurborg: http://www.reykjavik.is/Portaldata/1/Resources/skipbygg/vefur_2010/skjol/Adalskipulag_framhlid.pdf

Aðalskipulag Reykjavíkur 2001-2024. (n.d.). Retrieved december 29, 2011, from Reykjavíkurborg: http://www.reykjavik.is/desktopdefault.aspx/tabid-3818/6385_view-2732/

Agenda 21. (n.d.). Retrieved januar 24, 2012, from United Nations: http://www.un.org/esa/dsd/agenda21/res_agenda21_01.shtml

Agenda 21. (n.d.). Retrieved januar 24, 2012, from United Nations: http://www.un.org/esa/dsd/agenda21/res_agenda21_28.shtml

Almennt um staðardagskrá 21 - bakgrunnur. (n.d.). Retrieved march 30, 2012, from Umhverfis- og heilbrigðisstofa: http://www.umhverfisvefurinn.is/2/default.asp?sid_id=3423&tre_rod=013|002|&tId=1

Angel, S., Sheppard, S., & Civco, D. (2005, 09). *The Dynamics of.* Retrieved 02 22, 2012, from The World Bank: https://www.citiesalliance.org/ca/sites/citiesalliance.org/files/CA_Docs/resources/upgrading/urban-expansion/1.pdf

Arbury, J. (2005). *From Urban Sprawl to Compact City - An analysis of urban growth managemet in Auckland.* Aucland: University of Aucland.

Arnstein, S. (1969). A Ladder of Citizen Participation. In R. LeGates, & F. Stout, *The City Reader* (2 ed., pp. 233-244). New York: Routledge.

Borgarsýn. (2011). Retrieved december 27, 2011, from Reykjavíkurborg: http://www.reykjavik.is/Portaldata/1/Resources/skipbygg/frettir/2011/gogn/Borgarsyn_1tbl_2011.pdf

Bus Rapid Transit: Bogotá. (2008, january 28). Retrieved february 15, 2012, from Streetfilms: http://www.streetfilms.org/bus-rapid-transit-bogota/

Calavita, N. (1994). The new urbanism. *Journal of the American Planning Association , 60* (4), 534.

Care about the planet. (n.d.). Retrieved December 22, 2012, from PRLOG: http://www.prlog.org/10119688-wwwsustainable-development-forecastcom-launches-new-website-our-planet-is-in-danger.html

Carpooling in Iceland. (n.d.). Retrieved march 17, 2012, from Samferða: http://www.samferda.net/

Carruthers, J., & Ulfarsson, G. (2002). Fragmentation and Sprawl: Evidence from Interregional Analysis. *Growth and Change , 33* (3), 312-340.

Cities and Counties. (2011). Retrieved december 08, 2011, from Georgia Encyclopedia: http://www.georgiaencyclopedia.org/nge/Article.jsp?id=h-2207

City Profiles. (n.d.). Retrieved november 11, 2011, from Urban Audit: http://www.urbanaudit.org/CityProfiles.aspx

CNU. (n.d.). Retrieved february 07, 2012, from Congress for the New Urbanism: http://www.cnu.org

Columbia University. (n.d.). *The Encyclopedia of New York City*. Retrieved February 19, 2012, from Praise for first edition: http://www.dkv.columbia.edu/demo/enyc2/site/first-edition/

Corbusier, L. (1929). A Contemporary City. In R. LeGates, & F. Stout, *The City Reader* (4 ed., pp. 322-330). New York: Routledge.

Corruption Perceptions Index. (2011). Retrieved december 17, 2011, from Corruption Perceptions Index: http://cpi.transparency.org/cpi2011/results/

Dear, M. (1992). Understanding and Overcoming the NIMBY Syndrome. *Journal of the American Planning Association* , 288-300.

Dennis, K., & Urry, J. (2009). *After the Car.* Cambridge: Polity Press.

Design science news. (n.d.). Retrieved januar 23, 2012, from Bucminister Fuller institude: http://bfi-internal.org/dsnews/v10_no4.html

Dodman, D. (2009, April 02). *Urban Density and Climate Change.* Retrieved january 19, 2012, from United Nations Population Fund: http://www.unfpa.org/webdav/site/global/users/schensul/public/CCPD/papers/Dodman%20Paper.pdf

Dótakassi á Klambratúni. (2011, june 06). Retrieved march 05, 2012, from Morgunblaðið: http://www.mbl.is/frettir/innlent/2011/06/20/dotakassi_a_klambratuni/

Duany, A. (2006, november 01). *Lecture part 2 of 9.* Retrieved march 01, 2012, from youtube: http://www.youtube.com/watch?v=rwd4Lq0Xvgc

Efstasund. (2011, august 20). *Við Rauðarárvík í Reykjavík*. Retrieved march 05, 2012, from Flickr: http://www.flickr.com/photos/efstasund/6106890069/

Eigendur og stjórn. (n.d.). Retrieved april 20, 2012, from Strætó bs: http://www.straeto.is/um-fyrirtaekid/eigendur-og-stjorn/

Elle, M. (2012, 02 20). Vejledermøde den 20.02.12. (A. Þ. Hjaltested, Interviewer)

Elliðaárvogur. (n.d.). Retrieved december 29, 2011, from Reykjavíkurborg: http://www.reykjavik.is/desktopdefault.aspx/tabid-2240/6209_view-1830/

Ellis, C. (2007). *History Of Cities And City Planning.* Retrieved 02 22, 2012, from Art.Net: http://www.art.net/~hopkins/Don/simcity/manual/history.html

Ellis, C. (2002). The New Urbanism: Critiques and Rebuttals. *Journal of Urban Design , 7* (3), 261-291.

Engels, F. (1845). The Great Towns. In R. LeGates, & F. Stout, *The City Reader* (4 ed., pp. 50-58). New York: Routledge.

Europe Reflected in Archives. (n.d.). Retrieved februar 22, 2012, from http://www.euarchives.org/index.php?sch=3&lng=nat&pge=photo&cty=reykjavik&tmp=&nr=1

Farþegum Strætó fjölgar um 16,5% . (2011, october 07). Retrieved march 14, 2012, from Strætó bs: http://www.straeto.is/um-fyrirtaekid/frettir/nr/1080

Fischel, W. (1987). *The Economics of Zoning Laws: A Property Rights Approach to American Land Use Controls.* Baltimore: Johns Hopkins University Press.

Fishman, R. (1987). Bourgeois Utopias: Visions of Suburbia. In S. Fainstein, & S. Campbell, *Readings in urban theory* (2 ed., p. 31). Oxford: Blackwell Publishers.

Fishman, R. (1982). *Urban utopias in the twentieth century: Ebenezer Howard, Frank Lloyd Wright, and Le Corbusier.* MIT: MIT Press.

Fishman, R. (2003). Urban Utopias: Ebenezer Howard, Frank Lloyd Wright, and Le Corbusier. In S. Campbell, & S. Fainstein, *Readings in planning theory* (2 ed., p. 21). Oxford: Blackwell Publishers.

Fjölskrúðugar heimildir sagnfræðinga. (n.d.). Retrieved January 10, 2012, from https://notendur.hi.is/eggthor/heimildirAdal.html

Flyvbjerg, B. (2002). Planning and foucalty: In search of the dark side of planning theory. In P. Allmendinger, & M. Tewdwr-Jones, *Planning futures: new directions for planning theory* (pp. 44-62). London: Routledge.

Footprints in the sand. (n.d.). Retrieved february 28, 2012, from Royal Air Force: http://rafinegyptandaden1950sduddings.co.uk/RAFReykjavik1942to1943.aspx

Framtíðin Liggur í Loftinu. (n.d.). Retrieved april 04, 2012, from Reykjavíkurborg: http://www.reykjavik.is/Portaldata/1/Resources/umhverfissvid/Framtidin_liggur___loftinu.pdf

Furuseth, O. J. (1997). Neotraditional planning: A new strategy for building neighborhoods? *Land Use Policy , 14* (3), 201-213.

Gehl, J. (2010). *Cities for people.* Washington: Island Press.

Geographical data. (n.d.). Retrieved january 03, 2012, from Hagstofa Íslands: http://www.statice.is/Statistics/Geography-and-environment/Geographical-data

Geology of Iceland. (n.d.). Retrieved September 15, 2011, from Eldey: http://www.eldey.de/English/geology/geology.html

Google Maps. (2012). Retrieved january 03, 2012, from Google Maps: http://maps.google.is/

Græn borg Evrópu. (n.d.). Retrieved march 10, 2012, from Reykjavíkurborg: http://www.reykjavik.is/desktopdefault.aspx/tabid-3822/6631_view-3943/

Græn skef í Reykjavík 2009. (2009, july 19). Retrieved april 06, 2012, from Reykjavikurborg: http://www.reykjavik.is/desktopdefault.aspx/tabid-3822/6631_view-3007/

Græni trefillinn. (2006, october). Retrieved december 16, 2011, from Reykjavíkurborg: http://reykjavik.is/Portaldata/1/Resources/umhverfissvid/gr_na_borgin/3_kafli/3gogn1/Green_Scarf.pdf

Græni trefillinn. (2009, february 16). Retrieved december 16, 2011, from Reykjavíkurborg: http://www.reykjavik.is/Portaldata/1/Resources/skipbygg/frettir/2009/pdf/gr_ni-trefill-03-2009-loka.pdf

Grænn stígur í græna treflinum. (2009, february 02). Retrieved december 16, 2011, from Skógræktarfélag Íslands: http://www.skog.is/images/stories/verkefni/gtkynningfeb2009.pdf

Grant, J. (2009). Theory and Practice in Planning the Suburbs: Challenges to Implementing New Urbanism, Smart Growth, and Sustainability Principles. *Planning Theory and Practice , 10* (1).

Great Capital Area map. (n.d.). Retrieved februar 12, 2012, from Reykjavikurborg: http://www.reykjavik.is/Portaldata/1/Resources/umhverfissvid/myndir/skyrlsur/Hj_lrei_akort-Reykjavik-2010-Yfirlitskort-Lokautgafa.pdf

Greinargerð I. (2008, august 01). Retrieved march 19, 2012, from Reykjavíkurborg: http://www.reykjavik.is/Portaldata/1/Resources/skipbygg/adalskipulag_rvk1/greinarger__1/greinargerdI-_g_st2008.pdf

Guðjónsson, P. (n.d.). *Almenningssamgöngur á höfuðborgarsvæðinu*. Retrieved march 14, 2012, from Innanríkisráðuneytið: http://www.innanrikisraduneyti.is/media/Borgarnes27.4.2000/almenningssamgongurpallgudjonsson.PDF

Guðmundsson, E. (2010, september). *Tjónin í umferðinni á höfuðborgarsvæðinu árið 2009.* Retrieved april 20, 2012, from Sjóvá: http://www.sjova.is/files/2010_11_23_Tj%C3%B3nin%20%C3%A1%20h%C3%B6fu%C3%B0borgarsv%C3%A6%C3%B0inu%202009.pdf

Hagkvæm nýting lands. (n.d.). Retrieved november 11, 2011, from Reykjavíkurborg: http://www.reykjavik.is/Portaldata/1/Resources/SkipBygg/Adalskipulag_Rvk1/greinargerd_2/ar_4.pdf

Hall, P. (2002). *Cities of tomorrow: an intellectual history of urban planning and design in the twentieth century* (3 ed.). Oxford: Blackwell Pub.

Hall, P. (2001). The City of Theory. In R. LeGates, & F. Stout, *The City Reader* (4 ed., pp. 355-365). New York: Routledge.

Hathorne, M. J. (2010). Urban Design Reclaimed: Tools, Techniques, and Strategies for Planners. *Journal of the american planning association , 76* (4), 516.

Helgason, Á. (2004, july). *A Streetcar Named Strætó?* Retrieved april 21, 2012, from http://frontpage.simnet.is/romanza/greinar/umhverfi/streetcar/streetcar.htm

Hersveinn, G. (2009, august 13). *80% vegfaranda á Laugaveginum gangandi*. Retrieved march 09, 2012, from Náttúran: http://www.natturan.is/frettir/4803/

Hjaltested, A. Þ. (2011, juny 28). Project Pictures. Reykjavík, Reykjavík, Iceland.

Hjólaborgin Reykjavík. (2010, february). Retrieved april 07, 2012, from Reykjavikurborg: http://www.reykjavik.is/Portaldata/1/Resources/umhverfissvid/myndir/skyrlsur/hjolreidaa__tlun_LOW_OK.pdf

Hjólreiðar. (n.d.). Retrieved march 09, 2012, from Reykjavíkurborg: http://www.reykjavik.is/desktopdefault.aspx/tabid-3822/6631_view-2995/

Hodge, G., & Robinson, I. (2002). *Planning Canadian Regions.* Toronto: UBC Press.

Howard, E. (1898). Authors´s Introduction and The Town-Country Magnet. In R. LeGates, & F. Stout, *The City Reader* (4 ed., pp. 314-321). New York: Routledge.

Já. (2012). Retrieved january 04, 2012, from Já: http://ja.is/kort/#x=500000&y=500000&z=0&type=aerial

Jacobs, J. (1961). *The Death and Life of Great American Cities.* New York: Random House.

Jenks, M., Elizabeth, B., & Katie, W. (2005). *The compact city: A sustainable urban form?* Routhledge.

Jónsson, H., Sigurðsson, H., Gíslason, G., Örvarsdóttir, Ó., & Jónsson, Á. (2011). *Samantekt varðandi skipulag, lóðarmál og landþróun við Ártúnshöfða.* Reykjavík: Reykjavíkurborg.

Kelbaugh, D. (2002). The New Urbanism. In S. Fainstein, & S. Campbell, *Readings in urban theory* (pp. 354-361). Oxford: Blackwell Publishers.

Klukkustundarumferð 2008. (2008). Retrieved april 19, 2012, from Vegagerðin: http://www.vegagerdin.is/vefur2.nsf/Files/Klukkustundarumferd_2008/$file/Klukkustundarumfer%C3%B0%202008.pdf

Könnun á ferðavenjum sumarið 2010. (2010). Retrieved april 19, 2012, from Vegagerðin: http://www.vegagerdin.is/vefur2.nsf/Files/Konn_ferdarvenj_sumar_2010/$file/K%C3%B6nnun%20%C3%A1%20fer%C3%B0arvenjum%20sumari%C3%B0%202010.pdf

Landnámabók (Sturlubók). (n.d.). Retrieved september 20, 2011, from snerpa: http://www.snerpa.is/net/snorri/landnama.htm

(2004). *Landþörf samgangna.* Reykjavík: Skipulags- og byggingarsvið Reykjavíkurborgar.

Langdon, P. (1994). *A Better Place to Live: Reshaping the American Suburb.* United States of America: University of Massachusetts Press.

LeGates, R., & Stout, F. (1998). Modernism and Early Urban Planning, 1870-1940. In R. LeGates, & F. Stout, *The City Reader* (2 ed., pp. 299-313). New York: Routledge.

LeGates, R., & Stout, F. (2000). *The City Reader* (2 ed.). New York: Routledge.

LeGates, R., & Stout, F. (2007). *The City Reader* (4 ed.). New York: Routledge.

Leiðarkort. (n.d). Retrieved march 14, 2012, from Strætó bs: http://www.straeto.is/leidakort/

Leiðarljós og áherslur. (n.d.). Retrieved december 27, 2011, from Reykjavíkurborg: http://www.reykjavik.is/desktopdefault.aspx/tabid-2342/6201_view-1823/

Ljósmyndasafn Reykjavíkur. (n.d). Retrieved february 20, 2012, from Ljósmyndasafn Reykjavíkur: http://www.ljosmyndasafnreykjavikur.is/vefur/

llingworth, J., & Nadin, V. (2002). *Town and country planning in the UK* (13 ed.). London: Routledge.

Local Agenda 21 (LA21) Campaign. (n.d.). Retrieved april 04, 2012, from Local Government for Sustainability: http://www.iclei.org/index.php?id=687

Local Agenda 21. (n.d.). Retrieved march 30, 2012, from ARIES: http://aries.mq.edu.au/pdf_handbook/6-WhatIsLocalAg.pdf

London. (2011). *Design Principle*. Retrieved january 26, 2012, from London: http://www.london.gov.uk/thelondonplan/policies/4b-01.jsp

Lynch, K. (1984). *Good city form.* MIT Press.

maggih. (2009, august 14). *Fornbílaklúbbur Íslands*. Retrieved march 03, 2012, from Jón S. Loftsson: http://jsl210.com/spjall/viewtopic.php?f=1&t=2615

Mannfjöldaþróun. (2010). Retrieved january 10, 2012, from Hagstofa Íslands: https://hagstofa.is/lisalib/getfile.aspx?ItemID=12311

McClay, W. M. (2011). The Living City. *First Things: A Monthly Journal of Religion & Public Life* (218), 19-21.

Miðja Búsetu. (n.d.). Retrieved december 08, 2011, from Reykjavíkurborg: http://www.reykjavik.is/desktopdefault.aspx/tabid-3546/5704_view-1143/

Miklatún. (n.d.). Retrieved march 07, 2011, from Landslag: http://landslag.is/verk/miklatun

Miljøministeriet. (2007). *Fingerplan 2007.* København: Miljøministeriet.

Miller, D. (2004). Wat is Urban Sprawl, And Why Is It Considered Undesirable? In H. Richardson, & C. Bae, *Urban Sprawl in Western Europe and the United States* (pp. 256-257). Aldershot: Ashgate Publishing Limited.

Munteanu, L. (2012, Januar 05). Le Corbusier.

Newman, P., & Kenworthy, J. (1989). *Cities and automobile dependence: An international sourcebook.* Aldershot: Gower.

Newman, P., & Kenworthy, J. (1999). *Sustainability and cities: Overcoming automobile dependence.* Washington, D.C.: Island.

Nokia maps. (2012). Retrieved january 05, 2012, from Nokia maps: http://maps.nokia.com/?cid=ovimaps-fw-ilc-na-acq-na-map24-dk-na-1#/64.2260248,-11.7362135,5,0,0,normal.day?

Notkunarleiðbeiningar. (n.d.). Retrieved march 14, 2012, from Strætó bs: http://www.straeto.is/um-fyrirtaekid/leidbeiningar/

Nýr miðbær og Sundabraut. (2007, september 27). Retrieved january 08, 2012, from blog.is: http://midborg.blog.is/album/NyrmidbaerogSundabraut/

Olmsted, F. (1870). Public Parks and the Enlargement of Towns. In R. LeGates, & F. Stout, *The City Reader* (4 ed., pp. 307-313). New York: Routledge.

Our Common Future. (1987). Retrieved january 19, 2012, from United Nations: http://www.un-documents.net/ocf-02.htm

Pétursson, H. (2001, february 02). *Missum ekki af lestinni*. Retrieved march 14, 2012, from Morgunblaðið: http://mbl.is/greinasafn/grein/586871/

population and population density in the world. (n.d.). Retrieved november 30, 2011, from Statistics Norway: http://www.ssb.no/english/yearbook/2011/tab/tab-059.html

Randversson, P. F. (2009). *Restrip recycle Reykjavik.* Aalborg.

Revision of World Urbanization Prospects. (2009). Retrieved januar 19, 2012, from United Nations: http://esa.un.org/unpd/wup/Documents/WUP2009_Press-Release_Final_Rev1.pdf

Reykjavík - úr sveit í borg. (n.d.). Retrieved february 20, 2012, from Ferlir: http://www.ferlir.is/?id=7844

Reykjavík í mótun. (n.d.). Retrieved april 03, 2012, from Reykjavikurborg: http://www.reykjavik.is/Portaldata/1/Resources/umhverfissvid/Reykjavik_i_motun_Net.pdf

Reykjavik Municipal Region. (n.d). Retrieved March 02, 2012, from Macalester College: http://www.macalester.edu/courses/geog61/mahern/Geo_frames.html

Reykjavik: The ground heats the city. (n.d.). Retrieved januar 26, 2012, from Sustainable cities: http://sustainablecities.dk/en/city-projects/cases/reykjavik-the-ground-heats-the-city

Reykjavíkurborg. (2001). *Verslun á höfuðborgarsvæðinu: Velta smásöluverslunar í Reykjavík og á höfuðborgarsvæðinu eftir hverfum* . Reykjavík: Reykjavíkurborg.

Reykjavíkurborg-Umhverfissvið. (n.d.). *Umhverfisáætlun Reykjavíkur 2005-2010.* Retrieved januar 23, 2012, from islandia: http://www.islandia.is/lhm/greinasafn/2005/umhverfisaaetlun.pdf

Reynarsson, B. (n.d.). *Fyrirmyndarborgin*. Retrieved march 25, 2012, from Borgarfræðisetur: https://borg.hi.is/vub.htm

Rogers, D. J. (2010). *Broadband quantum cryptography.* San Rafael, Calif.: Morgan & Claypool Publishers.

Samgöngur. (n.d.). Retrieved april 17, 2012, from Umhverfisvefuronn: http://www.umhverfisvefurinn.is/default.asp?tId=1&sid_id=1344&Tre_Rod=006|&qsr

Samgönguskipulag í Reykjavík. (2006, february). Retrieved december 08, 2011, from Mannvit: http://www.mannvit.is/media/PDF/2006-Samgonguskipulag_i_Reykjavik_-_Fyrsti_hluti.pdf

Samgöngustefna Reykjavikur. (2006, mai 16). Retrieved april 05, 2012, from Reykjavíkurborg: http://www.reykjavik.is/Portaldata/1/Resources/umhverfissvid/stefnum_tun_og__r_un/Samgoengustefna.pdf

Satisfaction with Laugavegur being a pedestrian street. (2011, november 21). Retrieved february 17, 2012, from Reykjavíkurborg: http://www.reykjavik.is/en/desktopdefault.aspx/tabid-4631/8023_read-29087/

Sérakgreinar Strætisvagna á Höfuðborgarsvæðinu. (2010, march). Retrieved april 25, 2012, from Vegagerðin: http://www.vegagerdin.is/vefur2.nsf/Files/Serakrein_straetisvagna/$file/Serakrein_straetisvagna.pdf

Should We Live in Broadacre City. (2010, januar 28). Retrieved february 21, 2012, from http://mustikasarisayuti.blogspot.com/2010/01/should-we-live-in-broadacre-city.html

Sigurðsson, Á. Þ. (n.d.). *Samgöngustefna Reykjavíkur.* Retrieved april 05, 2012, from Lýðheilsustöð: http://www2.lydheilsustod.is/media/lydheilsa/Hjolad_i_vinnuna_-_Arni_Tor_Sigurdsson.pdf

Sigurðsson, H. (2011, october 21). Interview. (A. Þ. Hjaltested, Interviewer)

Sigurðsson, H. (2011). Nýtt aðalskipulag til ársins 2030. Reykjavík, Reykjavík, Iceland.

Sigurðsson, H. (2004, may). *Um ferðamáta á höfuðborgarsvæðinu.* Retrieved april 29, 2012, from Borgarfræðidsetur: https://borg.hi.is/Ferdavenjur.pdf

Skipulags- og byggingarsvið Reykjavíkurborgar. (2004). *Landþörf samgangna: Úttekt og greining á landnotkun gatnakerfisins helgunarsvæða þess og bílastæða í Reykjavík.* Reykjavik: Skipulags- og byggingarsvið Reykjavíkurborgar.

Söguleg kort. (2011, may 31). Retrieved january 20, 2012, from http://www.reykjavik.is/desktopdefault.aspx/tabid-3546/5704_view-4515/

Southworth, M. (1997). Walkable suburbs? An evaluation of neotraditional communities at the urban edge. *Journal of the American Planning Association , 63* (1), 28-44.

Stefánsdóttir, H., & Haraldsdóttir, H. (2010, march). *Skipulag á höfuðborgarsvæðinu.* Retrieved march 29, 2012, from Vegagerðin: http://www.vegagerdin.is/vefur2.nsf/Files/Skipul_houdborg-sjalfb_throun-samg/$file/Skipul_houdborg-sjalfb_throun-samg.pdf

Stefna og saga Strætó bs. (n.d.). Retrieved march 14, 2012, from Strætó bs: http://www.straeto.is/um-fyrirtaekid/stefna-saga/

Stefnumótun. (n.d.). Retrieved april 01, 2012, from Reykjavíkurborg: http://www.reykjavik.is/desktopdefault.aspx/tabid-3822/6631_view-3941/

Stiftel, B. (2000). Planning theory. In R. Pelaseyed, *The National A.I.C.P. Examination Course Guidebook 2000* (pp. 4-16). Washington, DC: American Institute of Certified Planners.

Strætó bs. (2006, october 17). Retrieved march 15, 2012, from Morgunblaðið: http://www.mbl.is/media/39/539.pdf

Strætó er líka valkostur. (2011, march 09). Retrieved april 27, 2012, from Neytendasamtökin: http://www.ns.is/ns/ns/frettir/frettir_2011/?ew_news_onlyarea=Content&ew_news_onlyposition=4&cat_id=81332&ew_4_a_id=375041

Strætó, bus network in Reykjavík. (n.d.). Retrieved april 20, 2012, from VSÓ: http://www.vso.is/english2/projects/projects-Straeto.html

Sustainable Development. (n.d.). Retrieved January 21, 2012, from International Association of Public Transport: http://www.uitp.org/Public-Transport/sustainabledevelopment/

Svæðisskipulag höfuðborgarsvæðisins 2001-2024. (2002, december 19). Retrieved march 30, 2012, from Kópavogsbær: http://www.kopavogur.is/media/pdf/Svaedisskipulag_2001-2024.pdf

Sveinsson, F. (2012, february 09). *Möguleikar skyndibílakerfis kannaðir hérlendis*. Retrieved march 09, 2012, from Vísir: http://www.visir.is/moguleikar-skyndibilakerfis-kannadir-herlendis/article/2012702099915

Sveitarfélög. (n.d.). Retrieved january 04, 2012, from Samband Íslenskra Sveitarfélaga: http://www.samband.is/sveitarfelogin/

sveitarstjórnir á Íslandi. (n.d.). Retrieved january 03, 2012, from Samband Íslenskra Sveitarfélaga: http://www.samband.is/media/skjol-um-sveitarfelog/Sveitarfelogin-a-Islandi.pdf

Talen, E. (2010). Affordability in new urbanist development: Principle, practice, and strategy. *Journal of Urban Affairs , 32* (4), 489-507.

Þættir úr sögu Reykjavíkur frá 1940. (n.d.). Retrieved february 17, 2012, from Háskóli Íslands: https://notendur.hi.is/eggthor/Sveitin.pdf

The path to a greener future. (n.d.). Retrieved November 15, 2011, from Universtiy of Oregon: http://uplan.uoregon.edu/subjects/Sustainability/sustainable.html

The World at Six Billion. (n.d.). Retrieved january 19, 2012, from United Nations: http://www.un.org/esa/population/publications/sixbillion/sixbilpart1.pdf

Þórarinsson, E. (2010, may). *Þétting byggðar í Reykjavík á skipulagstímabilinu 2001-2024.* Retrieved november 14, 2011, from Háskóli Íslands: http://skemman.is/stream/get/1946/7065/19035/1/BS_Egill_%C3%9E%C3%B3rarinsson.pdf

Tilraunaverkefni um 10 milljarða framlag til almenningssamgangna á tíu árum. (2011, april 13). Retrieved february 02, 2012, from Innanríkisráðuneytið: http://www.innanrikisraduneyti.is/frettir/nr/27082

Traditional Neighborhood Development (TND). (n.d.). Retrieved february 06, 2012, from Smart growth/smart energy: http://www.mass.gov/envir/smart_growth_toolkit/pages/mod-tnd.html

Umferðaröryggisáætlun 2002-2012. (2001, december). Retrieved april 09, 2012, from Umferðarstofa: http://www.us.is/scripts/WebObjects.dll/US.woa/swdocument/260/Umfer%F0ar%F6ryggis%E1%E6tlun+2002-2012.pdf

Umhverfis- og samgöngusvið Reykjavíkurborgar. (2009, november). Retrieved march 08, 2012, from Reykjavíkurborg: http://www.reykjavik.is/Portaldata/1/Resources/umhverfissvid/myndir/skyrlsur/4019489_reykjavikurborg_271109.pdf

Umhverfisvísar Reykjavíkurborgar. (2009). Retrieved december 17, 2011, from Reykjavíkurborg: http://www.reykjavik.is/Portaldata/1/Resources/umhverfissvid/myndir/skyrlsur/Umhverfisv_sar_loka_tg_fa.pdf

Umverfisáætlun Reykjavíkur. (n.d.). Retrieved april 15, 2012, from Nepal: http://nepal.vefurinn.is/Nepal_Skrar/Skra_0000651.PDF

United Nations Press Release. (2011, may 03). Retrieved january 19, 2012, from United Nations: http://esa.un.org/unpd/wpp/Documentation/pdf/WPP2010_Press_Release.pdf

Upplýsingatorg. (n.d.). Retrieved april 12, 2012, from Umferðarstofa: http://www.umferdarstofa.is/Apps/WebObjects/US.woa/wa/dp?id=1000387

Valsson, T. (2003). *Planning in Iceland: From the settlement to present times.* Reykjavík: University of Iceland Press.

Vatnsmýri. (n.d.). Retrieved march 20, 2012, from Reykjavíkurborg: http://www.reykjavik.is/Portaldata/1/Resources/SkipBygg/Adalskipulag_Rvk1/greinargerd_2/ar_21.pdf

Velfærdsministeriet. (2008). *Borgerne på banen.* Retrieved 02 23, 2012, from Social- og Integrationministeriet: http://www.sm.dk/data/Lists/Publikationer/Attachments/191/borgerne_paa_banen.pdf

Velo-mobility in CPH. (2011, may 14). Retrieved january 18, 2012, from http://velomobility-cph.blogspot.com/2011/05/chapter-3-two-guiding-frameworks.html

Ward, S. (1992). *The Garden city: past, present, and future.* Oxford: E & FN Spon.

Wheeler, S. (2004). *Planning For Sustainability: Creating Livable, Equitable, and Ecological Communities.* Madison Ave: Routledge.

Whitehand, J., & Morton, N. (2004). *Urban morphology and plannign: the case of fringe belts.* Retrieved december 01, 2012, from Mendeley: http://www.mendeley.com/research/urban-morphology-planning-case-fringe-belts/

Williams, K. (1999). Urban intensification policies in England: problems and contradictions. *Land Use Policy , 16* (3), 167-178.

Wissahickon Walk. (n.d.). Retrieved february 21, 2012, from http://ungeniodelmonton.blogspot.com/2009/05/utopia.html

World Development Indicators. (n.d.). Retrieved april 10, 2012, from Nations encyclopedia: http://www.nationsencyclopedia.com/WorldStats/WDI-transport-passenger-cars.html

World footprint. (2011, Februar 07). Retrieved Januar 07, 2012, from Global footprint network: http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/

World Obesity Stats – 2010 and Beyond. (2010, september 27). Retrieved januar 10, 2012, from HIVE Health Media: http://www.hivehealthmedia.com/world-obesity-stats-2010/

Wright, F. (1935). Broadacre City: A New Community Plan. In R. LeGates, & F. Stout, *The City Reader* (4 ed., pp. 331-336). New York: Routledge.

APPENDIX 1: ORIENTATION

Figure 0-1: Pictures of Artunshofdi cape (Nýr miðbær og Sundabraut, 2007)

Figure 0-2: T.L. Artunshofdi cape and T.R. ISAGA gas distribution company [(Nýr miðbær og Sundabraut, 2007) and (Hjaltested, 2011))

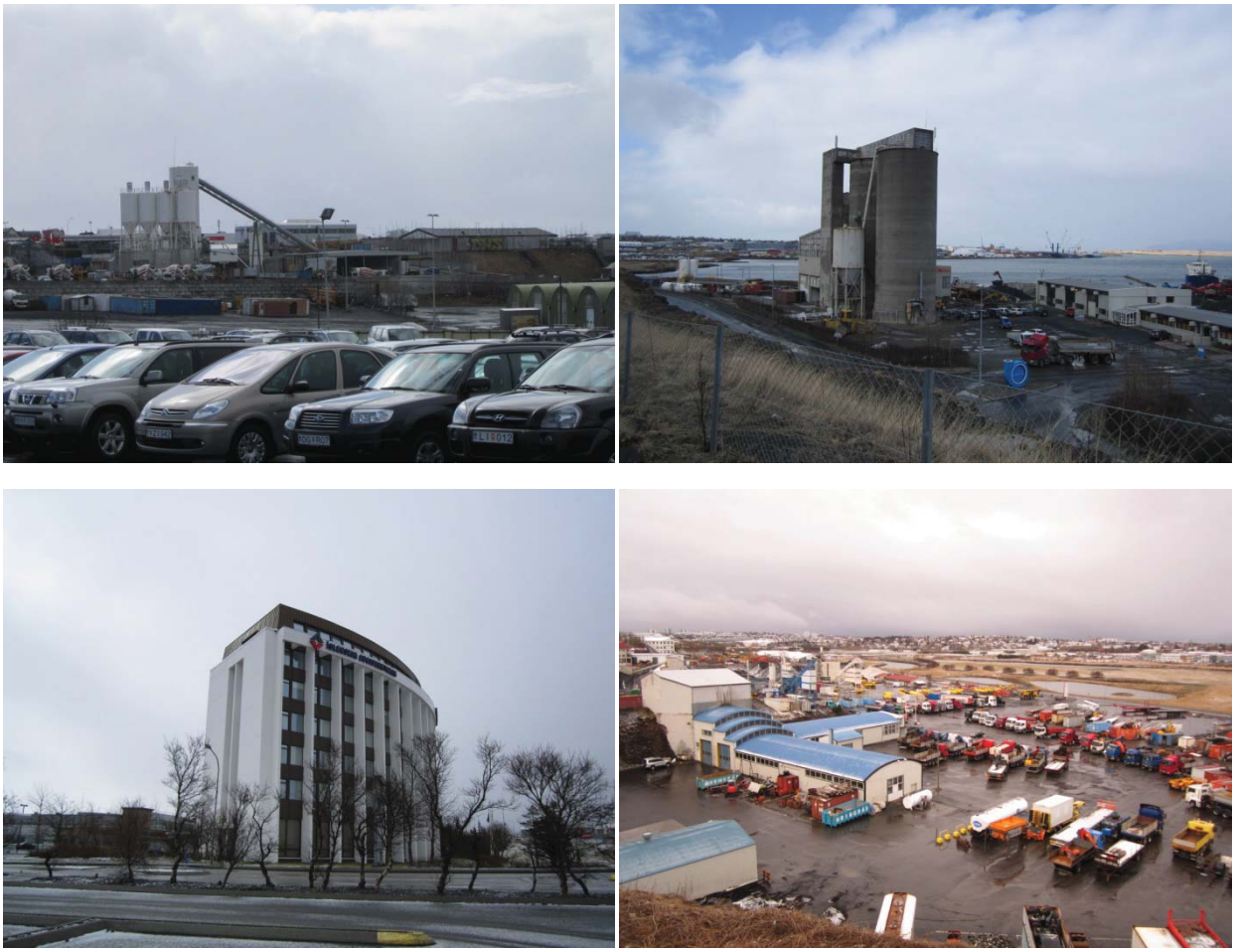


Figure 0-3: Different usage forms in the cape (Hjaltested, 2011)

Figure 0-4: Different building types in Artunshofdi cape (Hjaltested, 2011)

APPENDIX 2: ICELAND IN NUMBERS

Population by sex, age and municipalities 1998-2011
Municipality order 1. January 2011
Mannfjöldi eftir kyni, aldri og sveitarfélögum 1998-2011
Sveitarfélagaskipan 1. janúar 2011
Source: http://hagstofa.is/Hagtolur/Mannfjoldi/Sveitarfelog

Population of major towns 1 January 2011	
Name:	**Population:**
Reykjavik	118.898
Kopavogur	30.779
Seltjarnarnes	4.320
Garðabaer	10.909
Hafnarfjordur	26.099
Alftanes	2.484
Mosfellsbaer	8.642
Kjosarhreppur	210
Reykjanesbaer	13.971
Akureyri	17.754
Arborg	7.827

Population of major towns 1 January 2011		
Name:	**Population:**	**Density:**
Reykjavik	118,061	~ 436,5/km^2
Kopavogur	30,779	~ 340,0/km^2
Hafnarfjordur	26,099	~ 181,8/km^2
Gardabaer	10,909	~ 144,7/km^2
Mosfellsbaer	8,397	~ 45,8/km^2
Reykjanesbaer	13,862	~ 92,0/km^2
Akureyri	17,490	~ 139,0/km^2
Selfoss	6,512	~ 3,1/km^2

Population development and car ownership in Reykjavik from 1965-1990				
Year	Population of Reykjavik	Percentage of the Icelandic nation	Private car ownership	Private car per
1965	78399	40,5	12700	6,2
1970	81693	39,9	17800	4,6
1974	84772	39,1	25974	3,3
1980	83766	36,5	32693	2,6
1985	89868	37,1	39627	2,3
1990	97569	38,2	44935	2,2

Population development and car ownership in Reykjavik from 1990-2010				
Year	Population of Reykjavik	Percentage of the Icelandic nation	Private car ownership	Private car per
1990	97569	38,2	44935	2,2
1995	104258	38,9	46272	2,3
2000	111345	39,4	66239	1,7
2005	114800	38,3	86134	1,3
2010	118908	37,4	72609	1,6

Sources:
http://notendur.hi.is/eggthor/akureyrarradstefna.htm#_ednref4
http://www.reykjavik.is/Portaldata/1/Resources/framkvaemdasvid/umsvidid/utgefidefni/Slys_a_gangandi_vegfarendum_i_Reykjavik.pdf
http://www.saf.is/saf/upload/files/saga_ferdathjonustunnar/gomlu_vidtolin/saf-klemensjonsson_gomlu.pdf

Population development and car ownership in Reykjavik from 1801-1965							
Year	Population of Reykjavik	Percentage of the Icelandic nation	Private car ownership	Year	Population of Reykjavik	Percentage of the Icelandic nation	Private car ownership
1801	600	X	0	1920	17450	18,5	130
1860	1450	X	0	1925	22022	22,0	X
1870	2024	X	0	1930	28052	25,8	210
1880	2567	X	0	1935	34231	29,5	X
1890	3706	5,2	0	1940	38308	31,5	X
1895	4222	5,7	0	1945	46578	35,7	X
1900	5802	7,4	0	1950	55980	38,8	3000
1905	8997	11,1	~1	1955	63856	40,0	5500
1910	11449	13,4	X	1960	72407	40,8	7500
1915	14160	15,9	X	1965	78399	40,5	12700

Year	Population of Reykjavik	Percentage of the Icelandic nation	Year	Population of Reykjavik	Percentage of the Icelandic nation	Year	Population of Reykjavik	Percentage of the Icelandic nation
1801	600	X	1920	17450	18,5	1970	81693	39,9
1860	1450	X	1925	22022	22,0	1975	84856	38,7
1870	2024	X	1930	28052	25,8	1980	83766	36,5
1880	2567	X	1935	34231	29,5	1985	89868	37,1
1890	3706	5,2	1940	38308	31,5	1990	97569	38,2
1895	4222	5,7	1945	46578	35,7	1995	104258	38,9
1900	5802	7,4	1950	55980	38,8	2000	111345	39,4
1905	8997	11,1	1955	63856	40,0	2005	114800	38,3
1910	11449	13,4	1960	72407	40,8	2010	118908	37,4
1915	14160	15,9	1965	78399	40,5			

Year	Population of Reykjavik	Percentage of the Icelandic nation	Year	Population of Reykjavik	Percentage of the Icelandic nation	Year	Population of Reykjavik	Percentage of the Icelandic nation
1801	600	X	1927	24304	23,5	1969	81476	40,0
1860	1450	X	1928	25217	24,1	1970	81693	39,9
1870	2024	X	1929	26428	24,8	1971	82892	40,0
1880	2567	X	1930	28052	25,8	1972	83977	39,8
1889	3751	5,3	1931	28847	26,3	1973	84333	39,5
1890	3706	5,2	1932	30565	27,4	1974	84772	39,1
1891	3660	5,1	1933	31689	28,0	1975	84856	38,7
1892	3641	5,0	1934	32974	28,7	1976	84493	38,2
1893	3796	5,2	1935	34231	29,5	1977	83887	37,7
1894	4031	5,5	1936	35300	30,2	1978	83376	37,2
1895	4222	5,7	1937	36103	30,7	1979	83536	36,8
1896	4282	5,7	1938	37366	31,4	1980	83766	36,5
1897	4547	5,9	1939	38219	31,8	1981	84593	36,5
1898	5240	6,8	1940	38308	31,5	1982	86092	36,6
1899	5289	6,8	1941	39739	32,5	1983	87309	36,7
1900	5802	7,4	1942	40902	33,0	1984	88745	36,9
1901	6321	8,0	1943	42815	34,0	1985	89868	37,1
1902	7296	9,2	1944	44281	34,7	1986	91497	37,5
1903	7978	10,0	1945	46578	35,7	1987	93425	37,8
1904	8304	10,3	1946	48954	36,9	1988	95811	38,1
1905	8997	11,1	1947	51690	38,0	1989	96708	38,1
1906	9797	11,9	1948	53384	38,5	1990	97569	38,2
1907	10318	12,4	1949	54707	38,8	1991	99623	38,4
1908	11016	13,2	1950	55980	38,8	1992	100850	38,5
1909	11203	13,3	1951	57514	39,2	1993	101824	38,4
1910	11449	13,4	1952	58761	39,4	1994	103020	38,6
1911	12239	14,3	1953	60124	39,4	1995	104258	38,9
1912	12665	14,7	1954	62035	39,8	1996	105458	39,1
1913	13354	15,3	1955	63856	40,0	1997	106567	39,2
1914	13771	15,6	1956	65305	40,1	1998	108351	39,4
1915	14160	15,9	1957	67589	40,5	1999	109763	39,4
1916	14677	16,3	1958	69268	40,7	2000	111345	39,4
1917	15020	16,4	1959	71037	40,9	2001	112268	39,2
1918	15328	16,7	1960	72407	40,8	2002	112483	39,0
1919	16154	17,4	1961	73388	40,8	2003	113366	39,0
1920	17450	18,5	1962	74978	40,9	2004	113667	38,8
1921	18218	19,1	1963	76401	40,9	2005	114800	38,3
1922	19194	19,9	1964	77220	40,6	2006	116446	37,9
1923	20148	20,6	1965	78399	40,5	2007	117721	37,6
1924	20657	21,0	1966	79202	40,2	2008	119848	37,5
1925	22022	22,0	1967	80090	40,1	2009	118427	37,3
1926	23190	22,8	1968	81026	40,1	2010	118908	37,4

Population in Iceland 1703-2011
Municipality order 1. January 2011
Lykiltölur mannfjöldans 1703-2011 (frá Hagstofunni)

Year	Population 1. January in Iceland	Year	Population 1. January in Iceland	Year	Population 1. January in Iceland	Year	Population 1. January in Iceland	Year	Population 1. January in Iceland
1703	50358	1775	49234	1817	47333	1859	67697	1901	78203
1734	..	1776	49577	1818	47712	1860	67754	1902	78641
1735	43678	1777	49931	1819	47952	1861	66839	1903	79181
1736	43872	1778	50421	1820	47994	1862	66963	1904	79632
1737	44360	1779	50764	1821	48065	1863	66792	1905	80396
1738	44703	1780	50630	1822	47880	1864	67315	1906	81026
1739	45208	1781	50318	1823	48743	1865	68064	1907	82086
1740	45022	1782	49611	1824	49546	1866	68711	1908	82925
1741	44878	1783	49609	1825	50312	1867	68268	1909	83576
1742	45382	1784	49753	1826	50663	1868	69231	1910	84528
1743	45054	1785	45428	1827	50576	1869	69700	1911	85221
1744	45490	1786	40381	1828	50340	1870	69463	1912	85661
1745	45926	1787	39190	1829	50600	1871	70031	1913	86116
1746	46435	1788	39490	1830	51403	1872	70389	1914	87137
1747	46866	1789	39689	1831	52630	1873	70065	1915	88076
1748	47058	1790	40051	1832	53892	1874	70276	1916	89059
1749	47676	1791	40667	1833	54995	1875	70595	1917	89819
1750	48241	1792	40926	1834	55903	1876	71129	1918	91368
1751	48754	1793	41117	1835	55987	1877	70798	1919	91897
1752	49121	1794	41666	1836	56583	1878	71555	1920	92855
1753	48830	1795	42446	1837	56968	1879	71901	1921	94436
1754	48752	1796	43430	1838	57080	1880	71981	1922	95180
1755	48798	1797	44308	1839	57088	1881	72646	1923	96386
1756	48620	1798	45016	1840	56893	1882	73091	1924	97704
1757	47602	1799	45445	1841	57133	1883	71942	1925	98483
1758	44210	1800	46176	1842	57778	1884	70642	1926	100117
1759	43329	1801	47186	1843	58385	1885	71481	1927	101730
1760	43716	1802	47812	1844	57229	1886	72243	1928	103327
1761	44219	1803	47713	1845	57957	1887	72449	1929	104812
1762	44839	1804	46916	1846	58677	1888	70725	1930	106360
1763	44886	1805	46251	1847	57499	1889	70146	1931	108629
1764	44866	1806	46079	1848	57936	1890	70581	1932	109844
1765	45676	1807	46756	1849	58841	1891	70607	1933	111555
1766	46420	1808	47472	1850	59586	1892	71579	1934	113366
1767	46702	1809	47982	1851	60416	1893	72481	1935	114743
1768	46481	1810	48271	1852	60874	1894	72928	1936	115870
1769	46788	1811	48587	1853	61875	1895	73230	1937	116880
1770	47361	1812	48570	1854	63209	1896	74508	1938	117692
1771	47857	1813	48317	1855	64246	1897	75680	1939	118888
1772	48207	1814	47805	1856	64844	1898	76618	1940	120264
1773	48623	1815	47501	1857	65786	1899	77177	1941	121579
1774	48968	1816	47644	1858	66829	1900	77967	1942	122385

Year	Population 1. January in Iceland	Year	Population 1. January in Iceland	Year	Population 1. January in Iceland	Year	Population 1. January in Iceland	Year	Population 1. January in Iceland
1943	123996	1957	162700	1971	204834	1985	240606	1999	275712
1944	125967	1958	166831	1972	207361	1986	242203	2000	279049
1945	127791	1959	170156	1973	210912	1987	244157	2001	283361
1946	130356	1960	173855	1974	213722	1988	247561	2002	286575
1947	132750	1961	177292	1975	216695	1989	251919	2003	288471
1948	135935	1962	180765	1976	219262	1990	253785	2004	290570
1949	138502	1963	183991	1977	221046	1991	255866	2005	293577
1950	141042	1964	187314	1978	222552	1992	259727	2006	299891
1951	144293	1965	190652	1979	224522	1993	262386	2007	307672
1952	146540	1966	193919	1980	226948	1994	265064	2008	315459
1953	148978	1967	197221	1981	229327	1995	266978	2009	319368
1954	152506	1968	200281	1982	232182	1996	267958	2010	317630
1955	156033	1969	202695	1983	235537	1997	269874	2011	318452
1956	159480	1970	204042	1984	238416	1998	272381		

How much percentage of Icelandic population were the inhabitants of the Great Capital Area?
Answer: 63,6 %

How much percentage of Icelandic population were the inhabitants of the Great Capital Area?
Answer: 37,4 %

Population of students and elderly in Reykjavik municipality in 2011:

In total the population of Reykjavik in 2011 was: 118898
There of there were:

Age	Population	Age	Population	Age	Population	Age	Population	Age	Population
14	1468	22	1971	70	633	78	543	86	308
15	1420	23	1852	71	637	79	533	87	338
16	1533	24	1860	72	553	80	559	88	257
17	1601	25	1839	73	550	81	519	89	240
18	1644	66	929	74	545	82	474		
19	1584	67	844	75	584	83	473		
20	1803	68	843	76	597	84	459		
21	1812	69	696	77	563	85	374		

How many are student and elderly in Reykjavik Municipality?
Answer: 12865

How much percent are those of the whole population of Reykjavik municipality?
Answer: 10,8 %

Population more details

Year	The whole country	Great Capital Area	Reykjavik built area	Reykjavik
1889	70581	..	..	3751
1890	70607	..	..	3706
1891	71579	..	..	3660
1892	72481	..	..	3641
1893	72928	..	..	3796
1894	73230	..	..	4031
1895	74508	..	..	4222
1896	75680	..	..	4282
1897	76618	..	..	4547
1898	77177	..	..	5240
1899	77967	..	..	5289
1900	78203	..	..	5802
1901	78641	..	..	6321
1902	79181	..	..	7296
1903	79632	..	..	7978
1904	80396	..	..	8304
1905	81026	..	..	8997
1906	82086	..	..	9797
1907	82925	..	..	10318
1908	83576	..	..	11016
1909	84528	..	..	11203
1910	85221	..	..	11449
1911	85661	15469	12563	12239
1912	86116	16011	12985	12665
1913	87137	16736	13644	13354
1914	88076	17156	14048	13771
1915	89059	17596	14428	14160
1916	89819	18142	14976	14677
1917	91368	18568	15311	15020
1918	91897	18815	15572	15328
1919	92855	19841	16446	16154
1920	94436	21441	17773	17450
1921	95180	22339	18523	18218
1922	96386	23348	19487	19194
1923	97704	24270	20384	20148
1924	98483	25010	20910	20657
1925	100117	26631	22320	22022
1926	101730	27973	23494	23190
1927	103327	29241	24634	24304
1928	104812	30447	25731	25217
1929	106360	31934	27163	26428
1930	108629	33854	28957	28052
1931	109844	34896	29249	28847

Year	The whole country	Great Capital Area	Reykjavik built area	Reykjavik
1932	111555	35975	30986	30565
1933	113366	37231	32109	31689
1934	114743	38536	33426	32974
1935	115870	39725	34686	34231
1936	116880	40826	35856	35300
1937	117692	41601	36661	36103
1938	118888	42818	37915	37366
1939	120264	43579	38721	38219
1940	121579	43841	38894	38308
1941	122385	45367	40323	39739
1942	123996	46781	41552	40902
1943	125967	48718	43531	42815
1944	127791	50503	45147	44281
1945	130356	53212	47603	46578
1946	132750	56235	50305	48954
1947	135935	59287	53227	51690
1948	138502	61342	55149	53384
1949	141042	63264	56742	54707
1950	144293	65080	58304	55980
1951	146540	66939	60089	57514
1952	148978	68655	61636	58761
1953	152506	71002	63653	60124
1954	156033	73787	66179	62035
1955	159480	76516	68574	63856
1956	162700	78908	70589	65305
1957	166831	81960	73382	67589
1958	170156	84377	75467	69268
1959	173855	87010	77781	71037
1960	177292	89493	79930	72407
1961	180058	91309	81503	73388
1962	183478	93649	83605	74978
1963	186912	96071	85611	76401
1964	190230	98342	87280	77220
1965	193758	100949	89393	78399
1966	196933	103296	91094	79202
1967	199920	105603	92670	80090
1968	202191	107492	93953	81026
1969	203442	108406	94520	81476
1970	204578	109238	95011	81693
1971	207174	111282	96359	82892
1972	210775	113764	97848	83977
1973	213499	114947	98432	84333
1974	216628	116898	99356	84772
1975	219033	118234	99990	84856
1976	220918	118728	99971	84493

Year	The whole country	Great Capital Area	Reykjavik built area	Reykjavik
1977	222470	118912	99490	83887
1978	224384	119522	99571	83376
1979	226724	120574	100050	83536
1980	229187	121698	100685	83766
1981	231958	123578	101929	84593
1982	235453	126275	103883	86092
1983	238175	128434	105340	87309
1984	240443	130722	106955	88745
1985	242089	132510	108263	89868
1986	244009	134773	109964	91497
1987	247357	137941	112321	93425
1988	251690	141938	115389	95811
1989	253500	143864	116696	96708
1990	255708	145980	117898	97569
1991	259577			99623
1992	262193			100850
1993	264919			101824
1994	266783			103020
1995	267806			104258
1996	269727			105458
1997	272069			106567
1998	275264			108351
1999	278717			109763
2000	282849			111345
2001	286250			112268
2002	288202			112483
2003	290501			113366
2004	293186			113667
2005	299404			114800
2006	307261			116446
2007	312872			117721
2008	319756			119848
2009	317593	200800		118427
2010	318236	202370		118908

APPENDIX 3: TRANSPORTATION NUMBERS

Main Source: Hagstofan.is

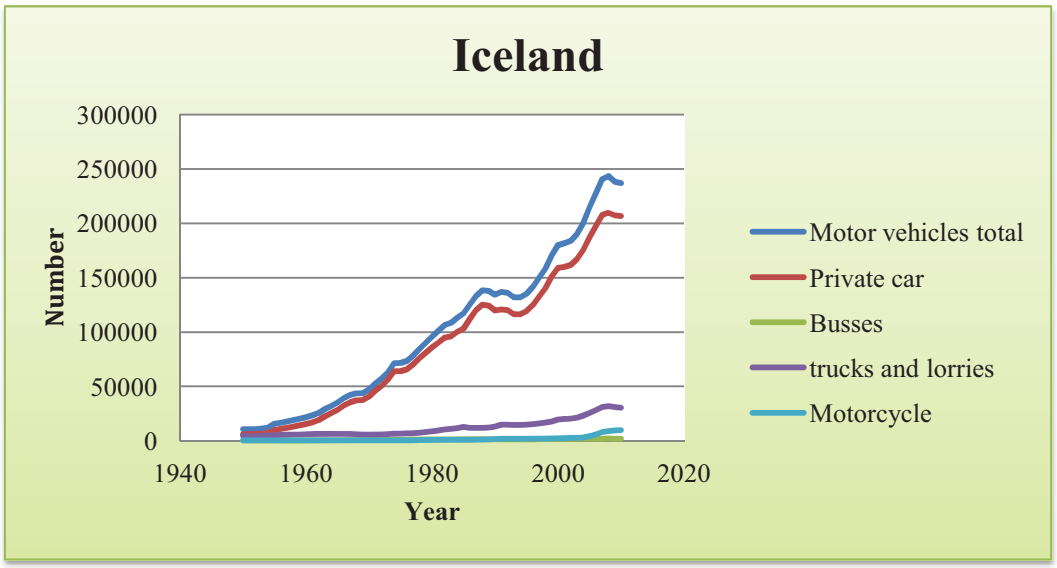
Iceland

Skrásett ökutæki 1950-2010

Number of private cars per 1000 people. All figures include private cars, automobiles, SUVs, vans, but exclude commercial vehicles and motorcycles and other motorized two-wheelers.

Year Ár	Motor vehicles total Bílar, alls	Private car Fólksbílar	Busses Hópbílar	trucks and lorries og sendibílar	Motorcycle Vélhjól	Private cars per 1000 ar pr. 1000 íbúa	Motor vehicles per 1000 per. 1000 íbúa	People per private Íbúar á hvern fólksbíl	inhabitants 1.Jan íbúar 1.jan.
1950	10716	6038	289	4389	427	41,8	34,0	23,9	141042
1951	10634	6135	285	4214	294	41,9	33,7	23,9	144293
1952	10774	6278	281	4215	292	42,1	34,2	23,7	146540
1953	11216	6553	293	4370	291	43	35,6	23,3	148978
1954	12193	7195	313	4685	312	46,1	38,7	21,7	152506
1955	15611	9812	328	5471	332	61,5	49,5	16,3	156033
1956	16583	10793	317	5473	328	66,3	52,6	15,1	159480
1957	17802	11936	331	5535	321	71,5	56,4	14	162700
1958	18807	12939	321	5547	316	76	59,6	13,2	166831
1959	20256	14228	325	5703	320	81,8	64,2	12,2	170156
1960	21621	15358	337	5926	335	86,6	68,5	11,5	173855
1961	23300	16754	351	6195	336	93	73,9	10,7	177292
1962	25485	18815	395	6275	324	102,5	80,8	9,8	180765
1963	29224	22342	406	6476	316	119,5	92,6	8,4	183991
1964	31924	25228	417	6279	308	132,6	101,2	7,5	187314
1965	34959	28334	445	6180	298	146,2	110,8	6,8	190652
1966	39278	32515	466	6297	309	165,1	124,5	6,1	193919
1967	42117	35491	500	6126	277	177,5	133,5	5,6	197221
1968	43606	37009	559	6038	290	183	138,2	5,5	200281
1969	43576	37304	555	5717	278	183,4	138,1	5,5	202695
1970	47011	40786	567	5658	288	199,4	149,0	5	204042
1971	52489	46081	656	5752	274	222,4	166,4	4,5	204834
1972	57155	50492	806	5857	296	239,6	181,2	4,2	207361
1973	63189	56274	845	6070	343	263,6	200,3	3,8	210912
1974	71364	63830	897	6637	420	294,7	226,2	3,4	213722
1975	71459	63900	938	6621	469	291,7	226,5	3,4	216695
1976	73410	65731	968	6711	465	297,5	232,7	3,4	219262
1977	78006	70064	1026	6916	475	314,9	247,3	3,2	221046
1978	84141	75679	1081	7381	511	337,3	266,7	3	222552
1979	90015	81025	1117	7873	563	357,4	285,3	2,8	224522
1980	95606	85924	1151	8531	631	374,9	303,1	2,7	226948
1981	100936	90258	1199	9479	681	389,1	320,0	2,6	229327
1982	106459	94728	1256	10475	779	402,3	337,5	2,5	232182
1983	108254	95982	1325	10947	804	403	343,2	2,5	235537

1984	113202	100244	1398	11560	849	416,9	358,8	2,4	238416
1985	117117	102954	1422	12741	865	425,3	371,3	2,4	240606
1986	125459	112329	1204	11926	862	460,3	397,7	2,2	242203
1987	133047	120149	1221	11677	917	485,7	421,8	2,1	244157
1988	138422	125226	1298	11898	973	497,5	438,8	2	247561
1989	137778	124273	1328	12177	1073	490,2	436,8	2	251919
1990	134181	119731	1328	13122	1535	468,2	425,4	2,1	253785
1991	136874	120862	1389	14623	1691	465,6	433,9	2,1	255866
1992	136148	120146	1157	14845	1806	458,2	431,6	2,2	259727
1993	131839	116195	1193	14451	1780	438,6	417,9	2,3	262386
1994	131840	116243	1249	14348	1825	435,7	417,9	2,3	265064
1995	135284	119232	1295	14757	1881	445,2	428,8	2,2	266978
1996	141532	124909	1363	15260	1950	463,1	448,7	2,2	267958
1997	149979	132468	1483	16028	2047	486,9	475,4	2,1	269874
1998	158466	140372	1544	16550	1906	509,9	502,3	2	272381
1999	170837	151409	1621	17807	2084	543,2	541,6	1,8	275712
2000	180041	158936	1673	19432	2278	561,9	570,7	1,8	279049
2001	181566	159865	1711	19990	2444	558,4	575,6	1,8	283361
2002	183698	161721	1699	20278	2557	560,6	582,3	1,8	286575
2003	189813	166869	1709	21235	2747	574,4	601,7	1,7	288471
2004	200224	175427	1762	23035	3105	597,6	634,7	1,7	290570
2005	214885	187442	1899	25544	4183	625	681,2	1,6	293577
2006	227321	197305	1929	28087	5699	641,3	720,6	1,6	299891
2007	240551	207513	1943	31095	8074	662,2	762,5	1,5	307672
2008	243516	209740	1955	31819	9009	656,7	771,9	1,5	315459
2009	238149	207226	1888	30923	9420	643,2	760,9	1,6	319368
2010	237089	206652	1916	30437	9651	643,8	757,6	1,6	317630
2011									318452



In 1950 how much percentage was the private car of the whole motor vehicles in Iceland?
Answer: 56,3 %

In 2010 how much percentage was the private car of the whole motor vehicles in Iceland?
Answer: 87,2 %

How much has the private car ownership increased during these 60 years in Iceland?
Answer: 3322,52 %

How many times has the private car ownership multiplied itself in these 60 years in Iceland?
Answer: 34,2 times

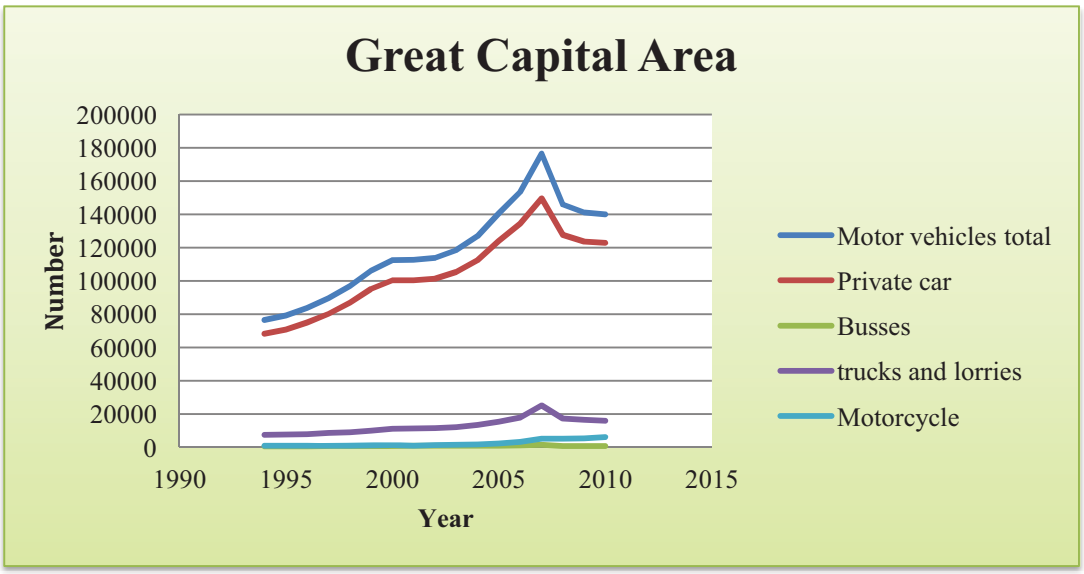
How much has the private car ownership increased between the years 1965-1990 in Iceland?
Answer: 1883,0 %

How many times did the car ownership multiply itself in the years from 1965-1990 in Iceland?
Answer: 4,2 %

Numbers of vehicles in The Great Capital Area 1994-2010

Höfuðborgarsvæðið

Year	Motor vehicles total	Private car	Busses	trucks and lorries	Motorcycle
1994	76524	68364	628	7532	946
1995	79361	70904	654	7803	961
1996	83806	75115	674	8017	1014
1997	89745	80341	756	8648	1107
1998	96921	86920	811	9190	1102
1999	106274	95332	870	10072	1192
2000	112650	100503	903	11244	1310
2001	112803	100458	926	11419	1036
2002	113927	101493	927	11507	1444
2003	118557	105440	941	12176	1587
2004	126951	112466	981	13504	1773
2005	140726	124164	1115	15447	2449
2006	153590	134511	1155	17924	3422
2007	176584	149728	1549	25307	5304
2008	145999	127835	914	17271	5243
2009	141188	123686	880	16617	5363
2010	140026	123023	909	16095	6168



How much % of whole Iceland motor vehicles are in the Great Capital Area?

Answer: 59,1 %

How much % of whole Iceland private cars are in the Great Capital Area?

Answer: 59,5 %

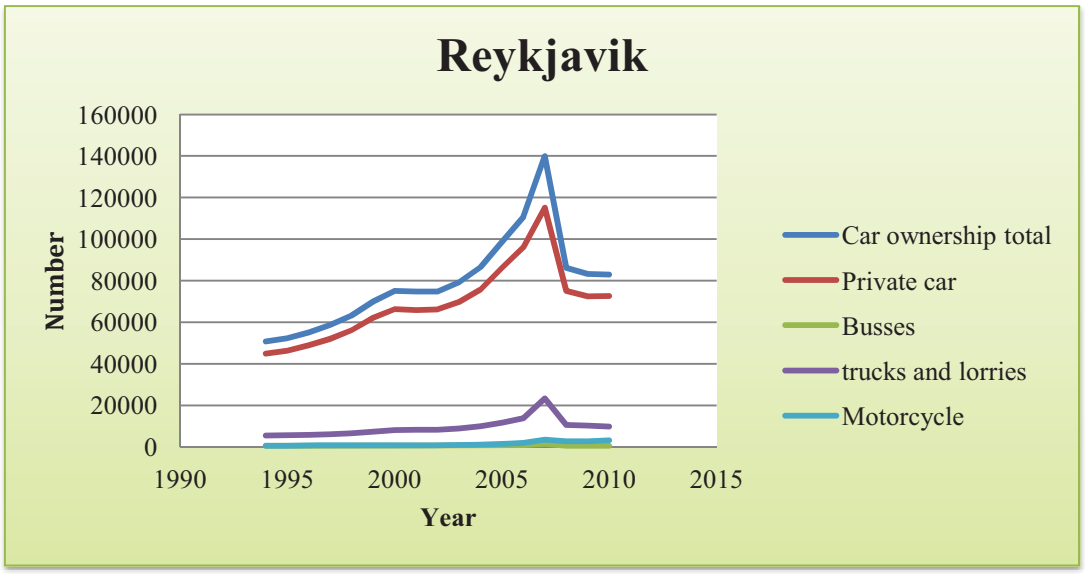
Numbers of vehicles in Reykjavík 1950-1993

Source:
http://www.reykjavik.is/Portaldata/1/Resources/framkvaemdasvid/umsvidid/utgefidefni/Slys_a_gangandi_vegfarendum_i_Reykjavik.pdf Page 38

Year	Private car	Year	Private car	Year	Private car	Year	Private car	Year	Private car
1950	3000	1974	25974	1981	34002	1987	46509	1992	46068
1955	5500	1976	26182	1982	35657	1988	48504	1993	44812
1960	7500	1978	29391	1983	36288	1989	48371		
1965	12700	1979	31175	1985	39627	1990	44935		
1970	17800	1980	32693	1986	43047	1991	46263		

Numbers of vehicles in Reykjavík 1994-2010

Year	Motor vehicles total	Private car	Busses	trucks and lorries	Motorcycle	Year	Population of Reykjavik	Percentage of the	Motor vehicles per 1000 people	Private cars per 1000 people	Persons per private car
1994	50726	44847	482	5397	591	1994	103020	38,6	492,4	435,3	2,3
1995	52356	46272	487	5597	607	1995	104258	38,9	502,2	443,8	2,3
1996	55048	48829	497	5722	636	1996	105458	39,1	522,0	463,0	2,2
1997	58649	51976	536	6137	681	1997	106567	39,2	550,3	487,7	2,1
1998	63165	56067	573	6525	669	1998	108351	39,4	583,0	517,5	1,9
1999	69946	62076	620	7250	718	1999	109763	39,4	637,2	565,5	1,8
2000	75037	66239	646	8152	805	2000	111345	39,4	673,9	594,9	1,7
2001	74836	65909	679	8248	631	2001	112268	39,2	666,6	587,1	1,7
2002	74836	66215	688	8289	872	2002	112483	39,0	665,3	588,7	1,7
2003	79260	69727	687	8846	942	2003	113366	39,0	699,2	615,1	1,6
2004	86477	75764	734	9979	1031	2004	113667	38,8	760,8	666,5	1,5
2005	98608	86134	851	11623	1377	2005	114800	38,3	859,0	750,3	1,3
2006	110706	95996	914	13796	1961	2006	116446	37,9	950,7	824,4	1,2
2007	139986	115146	1469	23371	3478	2007	117721	37,6	1189,1	978,1	1,0
2008	86126	75118	501	10548	2710	2008	119848	37,5	718,6	626,8	1,6
2009	83280	72488	481	10304	2759	2009	118427	37,3	703,2	612,1	1,6
2010	82929	72609	499	9822	3137	2010	118908	37,4	697,4	610,6	1,6



How many times has the private car ownership multiplied it self in Reykjavik in the time period 1994-2010?

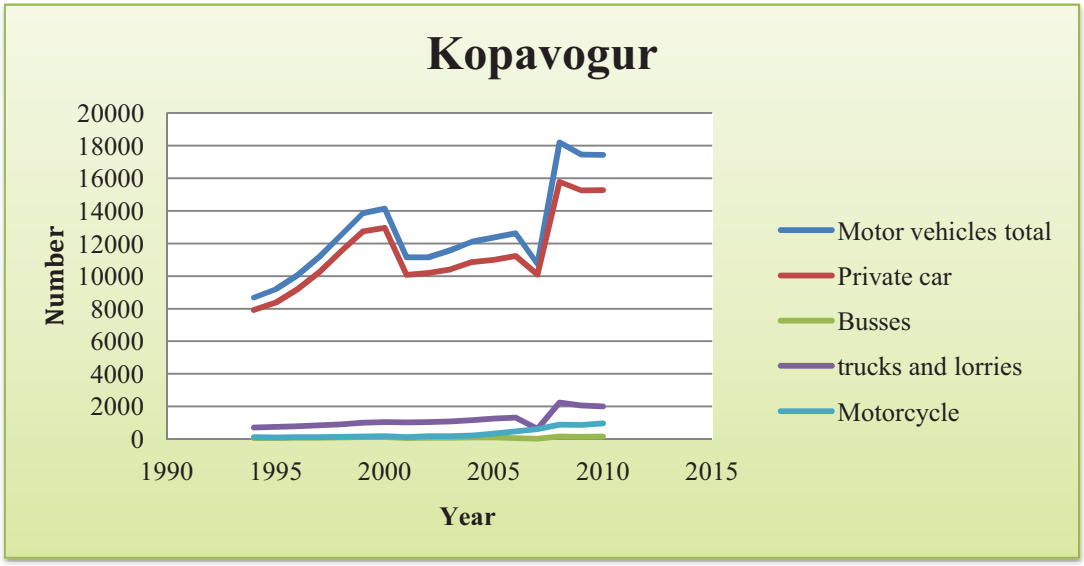
Answer: 1,6 times

How many times has the private car ownership multiplied it self in Reykjavik in the time period 1994-2007?

Answer: 2,6 times

Numbers of vehicles in Kopavogur 1994-2010

Year	Motor vehicles total	Private car	Busses	trucks and lorries	Motorcycle
1994	8682	7911	55	716	111
1995	9184	8370	67	747	110
1996	10053	9182	82	789	119
1997	11182	10252	89	841	130
1998	12532	11522	103	907	136
1999	13855	12741	118	996	161
2000	14137	12961	126	1050	170
2001	11149	10065	59	1025	125
2002	11149	10199	72	1050	170
2003	11580	10400	90	1090	181
2004	12115	10861	103	1151	225
2005	12364	11001	108	1255	331
2006	12617	11234	62	1321	474
2007	10746	10095	26	625	607
2008	18206	15794	152	2238	883
2009	17451	15252	143	2056	857
2010	17437	15281	150	2007	958



Population of Reykjavik by age 1. December 2010/Mannfjöldi eftir sveitarfélagi, kyni og aldri 1. desember 1997-2010

Reykjavík 2010

Age	Total	Age	Total	Age	Total	Age	Total	Age	Total
17 ára	1604	31 ára	2016	45 ára	1621	59 ára	1345	73 ára	550
18 ára	1639	32 ára	1837	46 ára	1588	60 ára	1321	74 ára	549
19 ára	1587	33 ára	1752	47 ára	1610	61 ára	1225	75 ára	587
20 ára	1808	34 ára	1837	48 ára	1575	62 ára	1172	76 ára	595
21 ára	1835	35 ára	1753	49 ára	1506	63 ára	1147	77 ára	563
22 ára	1987	36 ára	1637	50 ára	1594	64 ára	1046	78 ára	546
23 ára	1862	37 ára	1697	51 ára	1577	65 ára	988	79 ára	534
24 ára	1871	38 ára	1691	52 ára	1555	66 ára	929	80 ára	562
25 ára	1839	39 ára	1587	53 ára	1529	67 ára	846	81 ára	523
26 ára	2013	40 ára	1436	54 ára	1561	68 ára	844	82 ára	479
27 ára	2042	41 ára	1471	55 ára	1476	69 ára	698	83 ára	476
28 ára	2104	42 ára	1459	56 ára	1425	70 ára	632	84 ára	463
29 ára	2062	43 ára	1534	57 ára	1402	71 ára	637	85 ára	375
30 ára	2210	44 ára	1672	58 ára	1334	72 ára	555		

Total persons that drives car in Reykjavik:
Answer: 91382 Persons

How many persons (that can drive) are per private car in Reykjavik?
Answer: 1,3 Persons/car

In 2010, how much percentage is the motor vehicles ownership in The Great Capital Area concerning the whole country?
Answer: 59,1 %

Registered cars in Urban Audit cities - number of cars per 1000 inhabitants
Source:
http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=tgs00089&language=en

The Urban Audit provides European urban statistics for 258 cities across 27 European countries.

The Urban Audit was conducted at the initiative of the Directorate-General for Regional Policy at the European Commission, in cooperation with EUROSTAT and the national statistical offices of the 25 current Member States plus Bulgaria and Romania

Source: http://www.urbanaudit.org/

Number of cars per 1000 inhabitants in some of the countries and capitals/cities in the European Union							
Period: 2007-2009							
Belgium	480,4	Italy	605,1	Finland	509,5	Oslo	378,4
Brussel	485,8	Roma	707,4	Helsinki	-	Schweiz	517,5
Germany	453,1	Slovenia	515,9	Sweden	462,0	Zurich	389,3
Berlin	285,6	Ljubliana	547,4	Stockholm	369,8	Genéve	419,1
Netherlands	450,6	Austria	515,1	(Malmö)	394,3	Spain	-
Amsterdam	288,6	Wien	392,4	Norway	463,8	Madrid	484,1

Source: http://www.nationmaster.com/compare/Denmark/Norway/Transportation

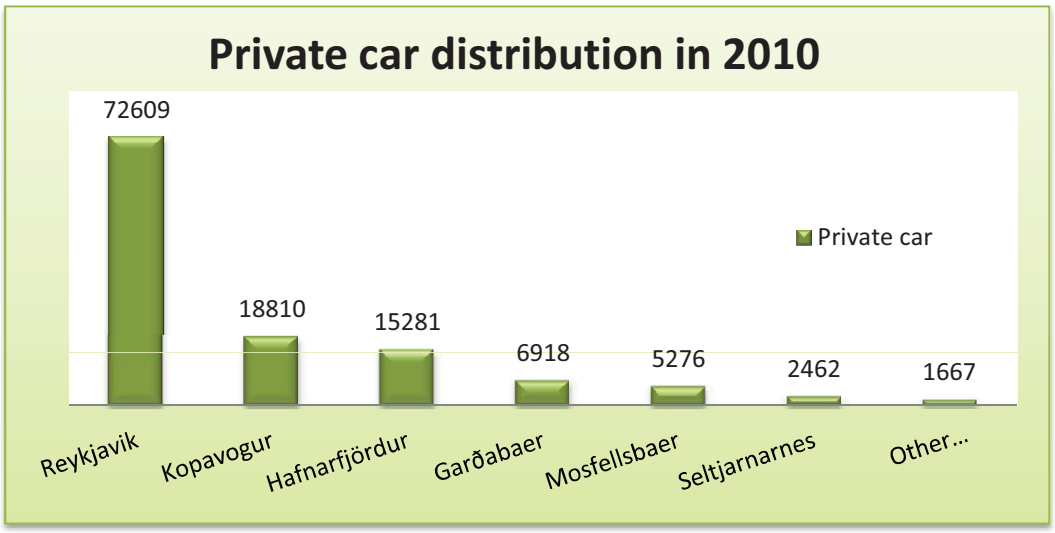
Iceland	643,2	USA	450,7
Reykjavik	612,09	Washington	

Vehicles distribution in each municipal on The Great Capital Area in 2010

Distribution of the private car in 2010 at The Great Capital Area

Fjöldi ökutækja 31. desember

	Motor vehicles	Private car	Busses	trucks and	Motorcycle
Whole country	237089	204736	1916	30437	11112
The Great Capital Area	140026	123023	909	16095	6168
Reykjavik	82929	72609	499	9822	3137
Kopavogur	21218	18810	167	2240	963
Hafnarfjördur	17437	15281	150	2007	958
Garðabaer	7810	6918	38	853	453
Mosfellsbaer	6176	5276	44	858	397
Seltjarnarnes	2593	2462	0	130	129
Other municipalities	1863	1667	11	185	131



How much percentage of the private cars are in the Reykjavik area, concerning the whole Great Capital Area?

Answer: 59,0 %

What about Kopavogur? 15,3 %

What about Hafnarfjördur? 12,4 %

What about Gardabaer? 5,6 %

What about Mosfellsbaer? 4,3 %

What about Seltjarnarnes? 2,0 %

What about the other municipals? 1,4 %

Total greenhouse ga Útstreymi lofttegunda sem valda gróðurhúsaáhrifum eftir uppruna
Sources:

http://www.hagstofa.is/?PageID=620&src=/temp/Dialog/varval.asp?ma=UMH03003%26ti=%DAtstreymi+lofttegunda+sem+valda+gr%F3%F0urh%FAsa%E1hrifum+eftir+uppruna+1990%2D2009%26path=../Database/land/lofttegundir/%26lang=3%26units=1.000 tonn

http://www.statice.is/?PageID=1168&src=/temp_en/Dialog/varval.asp?ma=UMH03003%26ti=Total+greenhouse+gas+emissions+by+source+1990%2D2009+%26path=../Database/land/lofttegundir/%26lang=1%26units=1.000 tonnes

	2009	
Total man-made emissions without carbon sequestration	4618	Heildarútstreymi af mannavöldum, án bindingar
Fuel combustion, total	1857	Eldsneytisbrennsla, alls
Industry and construction	262	Iðnaður og byggingastarfsemi
Road transport	893	Vegasamgöngur
Other transport	54	Aðrar samgöngur
Fishing vessels	603	Fiskveiðar
Other	46	Önnur eldsneytisbrennsla
Industrial processes, total	1828	Iðnaðarferlar, alls
Metal industry	1707	Málmiðnaður
Other industry	122	Annar iðnaður
Solvent and other product use	6	Efnanotkun
Agriculture	539	Landbúnaður
Waste	212	Úrgangur
Geothermal Power Plants	175	Jarðhitavirkjanir

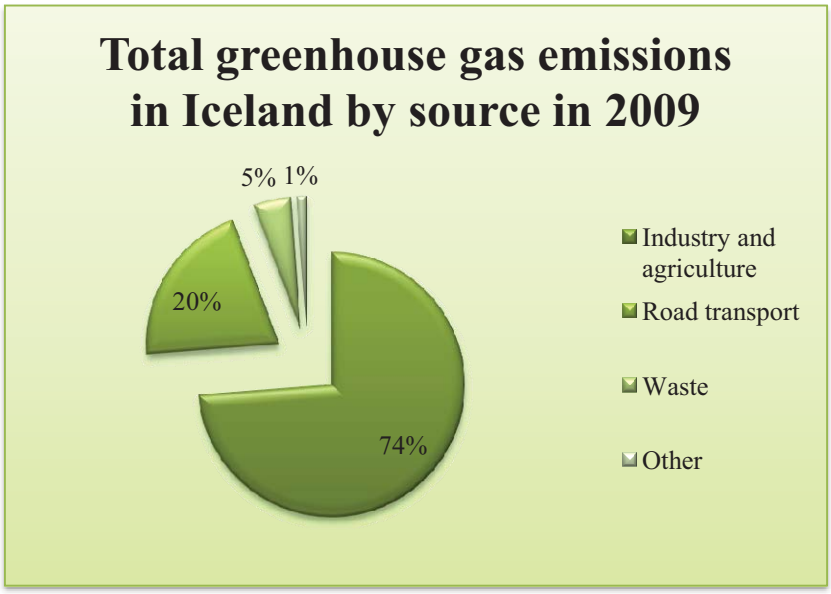
Total greenhouse ga Útstreymi lofttegunda sem valda gróðurhúsaáhrifum eftir uppruna
Source:
http://www.aalborgplus10.dk/media/pdf2009/091109_-_monitoring_and_evaluation_in_reykajvik.pdf
http://www.mannvit.is/media/PDF/2009-Losun_grodurhusalofttegunda_i_Reykjavik-Lokautgafa.pdf

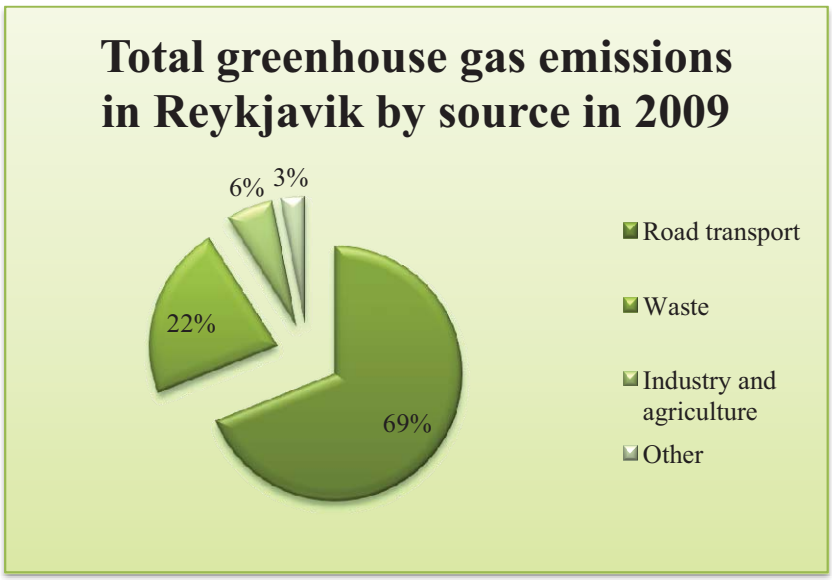
Iceland´s GHG emission in 2009

	Number	%
Industry and agriculture	3408	73,8
Road transport	947	20,5
Waste	212	4,6
Other	52	1,1
Total emission:	4619	100

Reykjavik´s GHG emission in 2009

	%	**Source: Mannvit**	Number	%
Road transport	69,0	Bílaumferð	219500	68,9
Waste	22,0	Atvinnustarfsemi	88750	27,9
Industry and agriculture	6,0	Flug, fiskveiðar og siglingar	10160	3,2
Other	3,0	Samtals:	318410	100,0
Total emission:	100,0			





Traffic accidents from 1981-2010
Umferðarslys 1981-2010

Year	Banaslys	Fjöldi látinna og slasaðra
1981	22	731
1982	21	768
1983	17	631
1984	24	789
1985	24	913
1986	21	792
1987	22	979
1988	24	940
1989	22	831
1990	19	881
1991	24	1153
1992	20	1348
1993	17	1451
1994	12	1485
1995	19	1655
1996	10	1568
1997	14	1511
1998	27	1605
1999	21	1726
2000	23	1520
2001	19	1302
2002	22	1514
2003	20	1244
2004	20	1179
2005	16	1032
2006	28	1358
2007	15	1673
2008	12	1585
2009	15	1299
2010	7	1269

How many die in traffic accident in average:
Answer: 19

How many are injured in traffic accident in average:
Answer: 1467,9

APPENDIX 4: DENSITY STATISTICS

Numbers of density in cities around the world

Sources: Europe, http://www.urbanaudit.org/CityProfiles.aspx **and United States,**
http://www.citypopulation.de/USA-Metro.html **and**
http://americandreamcoalition.org/highways/pb61_atlanta.pdf

	CITY AND LUZ LEVEL				
	CITY		LUZ		
	INDICATORS	YEAR	SCORE	YEAR	SCORE	Ratio City:LUZ
Denmark						
Copenhagen	Population density (residents per km2)	2004	5.630	2004	655	01:00,1
Aalborg	Population density (residents per km2)	2004	2.332	2001	80	
Aarhus	Population density (residents per km2)	2004	621	2001	140	
Finland						
Helsinki	Population density (residents per km2)	2004	3.008	2004	412	01:00,1
Tampere	Population density (residents per km2)	2004	382	2004	178	01:00,5
Turku	Population density (residents per km2)	2004	709	2004	171	01:00,2
Sweden						
Stockholm	Population density (residents per km2)	2004	4.052	2004	285	01:00,1
Goteborg	Population density (residents per km2)	2004	1.060	2004	219	01:00,2
Malmö	Population density (residents per km2)	2004	1.713	2004	302	01:00,2
Norway						
Oslo	Population density (residents per km2)	2004	1.225	2004	158	01:00,1
Bergen	Population density (residents per km2)	2004	534	2004	107	01:00,2
Trondheim	Population density (residents per km2)	2004	480	2004	36	01:00,1
United Kingdom						
London	Population density (residents per km2)	2001	4.689	2001	1327	01:00,3
Edinburgh	Population density (residents per km2)	2004	1.719	2004	457	01:00,3
Bristol	Population density (residents per km2)	2004	3.367	2004	616	01:00,2
Deutschland						
Berlin	Population density (residents per km2)	2004	3.798	2004	286	01:00,1
Hamburg	Population density (residents per km2)	2004	2.298	2004	429	01:00,2
Hannover	Population density (residents per km2)	2004	2.529	2004	436	01:00,2
United States						
Washington			2100		383	
Atlanta			654		243	
Houston			1100		258	

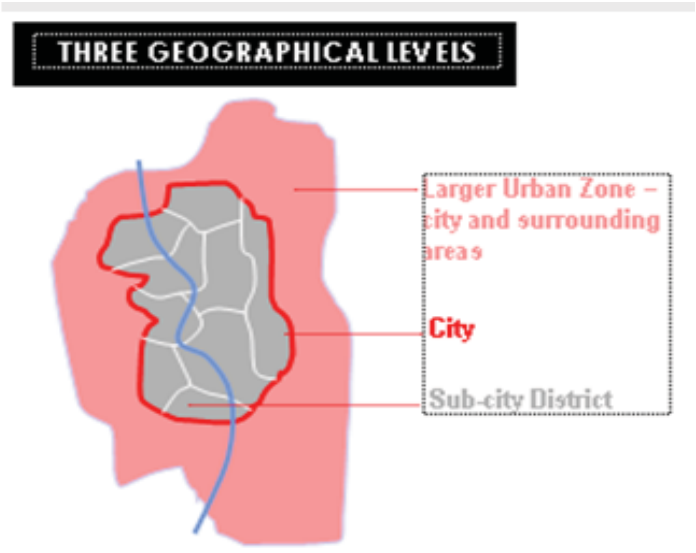
Icelandic density numbers:

Sources:
http://visindavefur.hi.is/svar.asp?id=2245
http://www.hagstofa.is/Hagtolur/Mannfjoldi/Yfirlit
http://www.urbanaudit.org/help.aspx

	Km^2	Persons in 2010	$Persons/km^2$
The Great Capital Area			
LUZ Size:	1062		
LUZ Population:		202370	
LUZ Density:			191
Reykjavik			
Size:	273		
Population:		118908	
Density:			436
Size of main populated area:	63		
Population of main populated area:		117908	
Reykjavik main populated area:			1872
Iceland			
Size:	103000		
Population:		318236	
Density:			3

How much % is the population of the main populated area of Reykjavik?
Answer: 99,2 %
What is the density of the main populated area in people per hectare?
Answer: 1,872 people/hectare

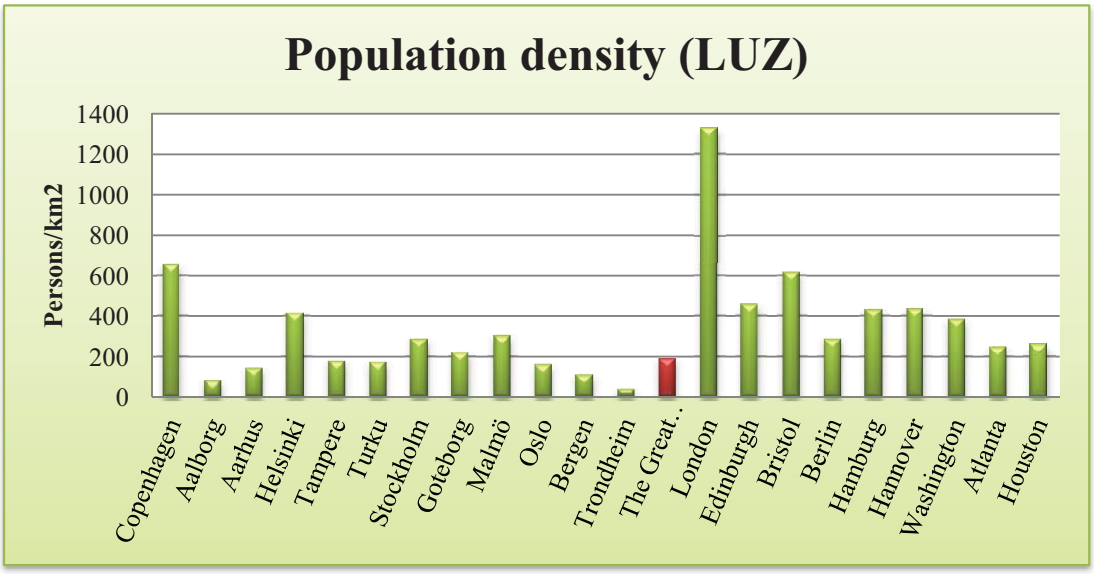
What is the Larger Urban Zones (LUZ)



The Large Urban ZONE (LUZ) areas of the cities

Withdrawal from tables from above!

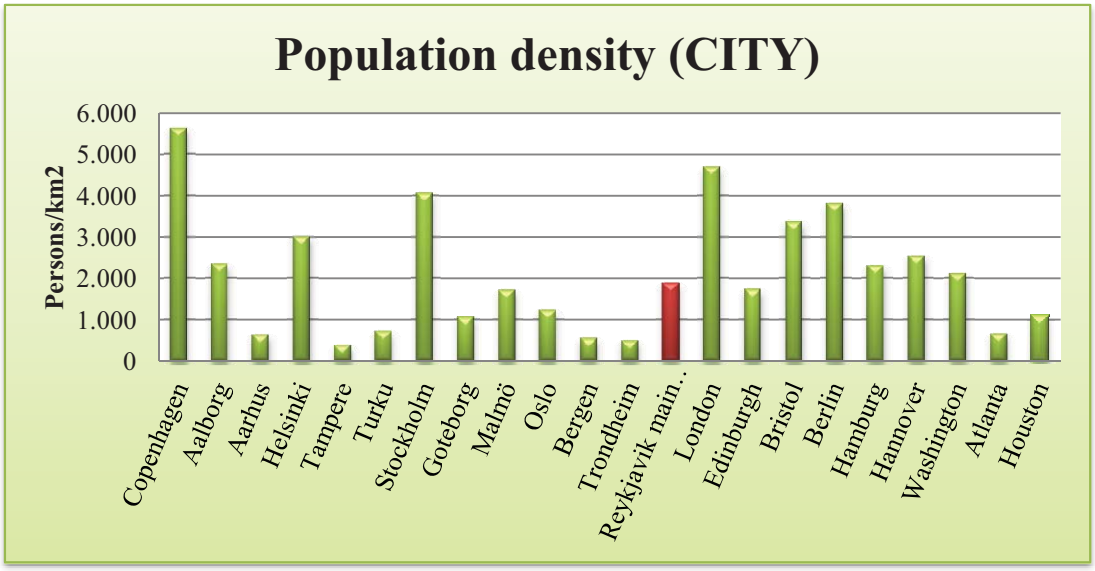
Copenhagen	655	**Europe**
Aalborg	80	
Aarhus	140	
Helsinki	412	
Tampere	178	
Turku	171	
Stockholm	285	
Goteborg	219	
Malmö	302	
Oslo	158	
Bergen	107	
Trondheim	36	
The Great Capital Area	191	
London	1327	
Edinburgh	457	
Bristol	616	
Berlin	286	
Hamburg	429	
Hannover	436	
Washington	383	**United States**
Atlanta	243	
Houston	258	



The CITY areas of the cities

Withdrawal from tables from above!

Copenhagen	5.630	**Europe**
Aalborg	2.332	
Aarhus	621	
Helsinki	3.008	
Tampere	382	
Turku	709	
Stockholm	4.052	
Goteborg	1.060	
Malmö	1.713	
Oslo	1.225	
Bergen	534	
Trondheim	480	
Reykjavik main populated	1872	
London	4.689	
Edinburgh	1.719	
Bristol	3.367	
Berlin	3.798	
Hamburg	2.298	
Hannover	2.529	
Washington	2100	**United States**
Atlanta	654	
Houston	1100	



Reykjavik's density and its development between 2001-2009

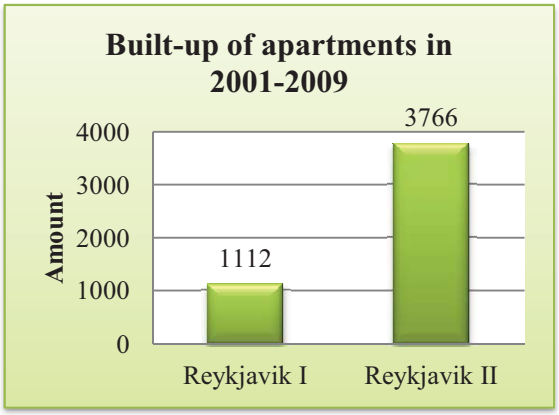
Source: Page 49 in the link below
http://skemman.is/stream/get/1946/7065/19035/1/BS_Egill_%C3%9E%C3%B3rarinsson.pdf

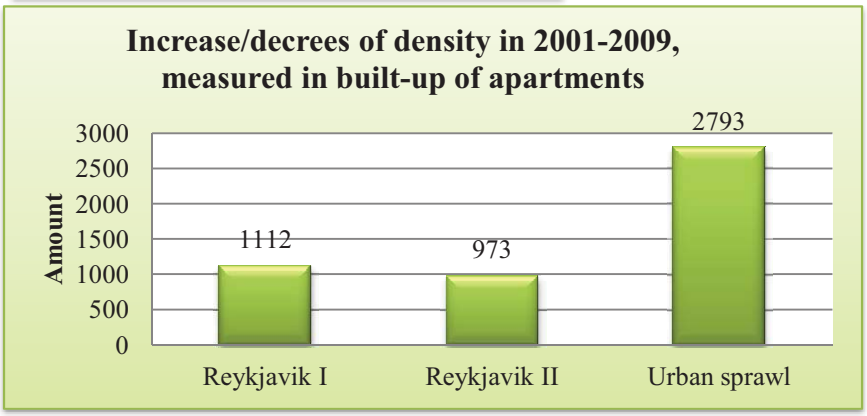
Total apartments built:	4878
In Reykjavik I:	1112
In Reykjavik II:	3766
Total built to make denser municipal:	2085
How much is that of the total:	
Answer:	43 %
Built in Reykjavik II to make denser built environment:	973
How much is that of the all Reykjavik II:	
Answer:	26 %

For the graphs:

Reykjavik I	1112
Reykjavik II	3766

Reykjavik I	1112
Reykjavik II	973
Urban sprawl	2793





Amount and percentage of jobs in 2005

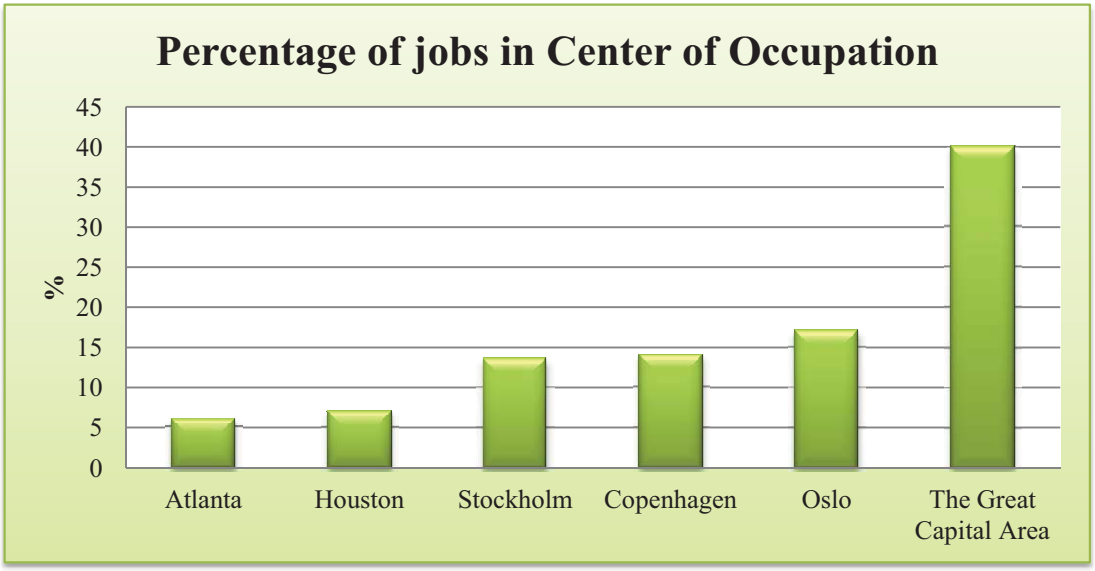
Source:
http://www.mannvit.is/media/PDF/2006-Samgonguskipulag_i_Reykjavik_-_Fyrsti_hluti.pdf

The Great Capital Area	100000
Reykjavik Municipal	80000
Center of National Interest	40000

How many % of the Great Capital Area jobs are in the Center of National Interests
Answer: 40 %

How many % of the Reykjavik Municipal jobs are in the Center of National Interests
Answer: 50 %

Atlanta	6
Houston	7
Stockholm	13,5
Copenhagen	14
Oslo	17
The Great Capital Area	40



APPENDIX 5: INTERVIEWS

Three interviews were conducted during the project period. They were held in Reykjavik, Iceland in October 2011 and were in Icelandic. The main interview used in the report was written down but not the two latter as they were not used directly in the report. First short description of all three interviews (in English) is held, followed by the main interview in Icelandic.

The first interview was with Haraldur Sigurðsson planner and head of the urban planning department at the City of Reykjavik. In this 1 hour and 40 minutes interview Haraldur told me in general about his ideas about how the current and future situation and visions about the urban development in Reykjavik as well the Great Capital Area. We talked about if a merger should take place in the Great Capital Area and what were needed so a less automobile dependence is to be reached. Public transportation were thus also discussed and the future Master Plan 2010-2030 for Reykjavik municipality. Haraldur also gave me a little intro to the rivalry between municipalities and political forces in the urban development practice. I got as well opportunity to ask Haraldur about the Artunshofdi cape area and other key areas for future built-up of the municipality. Sprawl of the city was also on the agenda as well as measurements taken towards sustainability in the municipality.

The second interview was with Halldór Eyjólfsson head of development at Klasi, Investment Company. Klasi has been in the forefront concerning many urban development projects in Reykjavik and at the south-west corner of the island. Klasi has bought some grounds in the Artunshofdi cape and wants to start to develop the cape in the near future. Klasi has among other things started a project about their own development ideas for the whole cape, not only their own grounds and thus did the interview concern mainly the Artunshofdi cape area. The interview that lasted for about 1 hour and 40 minutes thus gave me another viewpoint over the urban development of the Artunshofdi cape. Halldór gave me a good overview over his and Klasi ideas for the cape and it revealed that not always the urban development department of Reykjavik municipal and the private investor's ideas are in harmony.

The third interview were with Gunnar H. Gunnarsson retired civil engineer at the City of Reykjavik and political enthusiastic. Gunnar once worked at the City of Reykjavik and knows well the processes that lie behind decision making. Gunnar in this approximate 3 hour interview was eager to tell me about the rivalry and the corruption that he had witnessed in his former work and now as a politician enthusiastic.

Interview with Haraldur Sigurðsson planner and head of the urban planning department at the City of Reykjavik

Interview were conducted 21 October 2011

Arnar: Er það góð hugmynd að þínu mati að sameina sveitarfélögin 8 (Reykjavík, Kópavogur, Seltjarnarnes, Mosfellsbær, Kjósarhreppur, Garðabær, Hafnarfjörður og Álftanes) á stór Reykjarvíkur svæðinu? myndi það greiða fyrir í skipulagsmálum?

Haraldur: Það er mikið rætt um að sameina sveitarfélögin. Varðandi öll þessi markmið sem snúa að sjálfbærni í borgarþróun þá er Reykjavík að vinna að sínum markmiðum sér í sínu Aðalskipulagi. Það er auðvitað gildandi Svæðisskipulag fyrir höfuðborgar svæðið en það er auðvitað óþægilegt þegar sveitafélögin eru ekki alveg í takt hvað þessi mál varða. Til að mynda þá er Reykjavík núna að vinna í nýju Aðalskipulagi þar sem eru miklu metnaðarfyllri markmið varðandi þéttingu byggðar og slíka hluti heldur en hið gildandi Svæðisskipulag. Það er kannski hægt að segja að helsta skipulagsvandamálið í dag er þessi fjöldi sveitarfélaga á svæðinu, það gerir að það er erfiðara að framfylgja öllu skipulagi. Það myndi ss klárlega greiða fyrir í skipulagsmálum og skila hagræðingu að sameina sveitarfélögin á svæðinu. Auðvitað myndi það einnig skila svipuðum markmiðum og árangri ef að sveitarfélögin færu að hugsa eins hvað skipulagsmál varðar, og einbeita sér af að hætta útþenslu byggðarinnar og bæta gangandi og hjólandi samt strætisvagna samgöngur. Ef sú yrði raunin þá er hægt að segja að sveitarfélagsmörkin séu ekki til trafala en það er ólíklegt að sveitarfélögin fari að ganga í takt í þessum málum (5mín). Ofan í þetta bætist svo samkeppnin á milli sveitarfélaga.

Arnar: Sumir hafa bent á að samkeppnin milli sveitafélaga sé kannski af hinu góða, t.d. hvað varðar laun, störf, þjónustu og húsnæði, hvað finnst þér um það?

Haraldur: Samkeppnin er að sumu leiti holl hvað varðar að laða til sín fyrirtæki og slíkt, en þetta er náttúrulega fákeppnismarkaður sem við búum við á höfuðborgarsvæðinu. Þessi hugmyndafræði um frjálsa samkeppni nær aldrei að ná inn á byggingarmarkaðinn, út af því að byggingarmarkaðurinn er alltaf lóðaúthlutun. Þetta er í raun ekki hreinn markaður því að sveitarfélögin eiga landið. Ef við tökum sem dæmi t.d. sveitarfélögin Kopavogur og Hafnarfjordur þá eru þau oftar en ekki að niðurgreiða sínar lóðir meira heldur en Reykjavík gerir/gerði. Reykjavík til að mynda hóf snemma að láta þá sem sóttust eftir lóðum bjóða í lóðir sveitarfélagsins, eins og t.d. var tilfellið með Norðlingaholtið, í Úlfarsdal (þegar vinstristjórnin var við völdin). Ef öll sveitarfélögin hefðu gert þetta þá hefði nokkuð eðlileg staða skapast á markaðinum en hin sveitarfélögin buðu upp á lóðir á kostnaðarverði, eitthvað sem Reykjavík fór svo að gera seinna (þegar sjálfstæðið, hægristjórnin, kom til valda aftur, 2006). Það liggur í hlutarins eðli að þær lóðir sem eru í úthverfunum eða ss fjærst frá miðju sveitarfélagsins, þ.e.a.s. lengst frá kjarnanum eru ódýrastar og með því þar að auki að niðurgreiða þær lóðir þá ýtir sveitarfélagið óneytanlega undir þróun til úthverfana. Það væri auðvitað hægt að hugsa sér að til að ná ákveðnu jafnvægi eða markmiði þéttingar þá gætu sveitarfélögin hafa tekið upp á því að niðurgreiða lóðir eða ss bjóða upp á lóðir á kostnaðarverði sem væru miðsvæðis en þar skapast hinsvegar vandamál í Reykjavík. Í Reykjavík þá eru til að mynda stór hluti af lóðum innar byggðar á hendi einkaaðila eins og t.d. stór hluti af miðborgarsvæðinu. Þetta gerir þessa glímu óneytanlega erfiðari.

Arnar: Myndir þú þá halda að í framtíðinni komi sveitarfélögin á höfuðborgarsvæðinu til með að sameinast í eitt sveitarfélag?

Ég efast um það að höfuðborgarsvæðið komi eitthverntíman til með að vera eitt sveitarfélag. Ég held frekar að þetta komi til með í framtíðinni að vera tvö sveitarfélög, þ.e.a.s. Reykjavík, Kjósarhreppur, Mosfellsbær og Seltjarnarnes verði eitt sveitarfélag og Kópavogur, Hafnarfjörður, Garðabær og Álftanes myndi annað. Sumir hafa hinsvegar nefnt það að Hafnarfjörður, Garðabær og Álftanes verði eitt og Kópavogur og Reykjavík annað, þar sem landamæri Kópavogs og Reykjavíkur eru svo fléttuð saman, en ég tel það ekki pólitískt raunhæft, þrátt fyrir að sú stjórn sem er yfir Kópavogi í dag hugsar á allt annan hátt en fyrri stjórnir. Fyrri stjórnir voru með mjög metnaðarfullar hugmyndir varðandi að gera Kópavog að stóru sveitarfélagi. (10mín)

Haraldur bætir við: Það er mikil umræða núna varðandi endurskoðun á Svæðisskipulaginu fyrir Höfuðborgarsvæðið, þar sem það er vitað að sveitarfélögin koma ekki til með að sameinast strax. Það er ss talað um núna hvort það eigi að gera sameiginlegt Aðalskipulag fyrir Höfuðborgarsvæðið, en lögum samkvæmt er það ekki svo auðvelt. Þess vegna er í staðin hægt að hugsa sér að það sé hægt að búa til Svæðisskipulag fyrir Höfuðborgarsvæðið sem er í nákvæmni Aðalskipulags. Á þennan máta geta menn/sveitarfélögin sameinast um markmiðin, en ég er reyndar á þeirri skoðun að á meðan að skipulagsvaldið og tekjustofnar af uppbyggingu eru sjálfstæðir ss milli sveitarfélagsmarka þá næst aldrei alvöru sameiginlegu Svæðisskipulag eða Aðalskipulagi. Það að geta hugsa sér Svæðisskipulag eða Aðalskipulag fyrir Höfuðborgarsvæðið allt með ákveðinni forgangsröðun svæða, þá svæði sem eru miðlægt séu með áherslu á þéttingu, og svæði sem eru í útjaðri verði aftast í forgangsröðinni getur í raun ekki gengið upp á meðan tekjurnar skiptast á milli sveitarfélagana, þetta er í raun bara ákveðin draumsýn. Ef að menn ætla að gera þetta á þá veru að hvert sveitarfélag hefur sitt stjórnsýslu umdæmi, með sjálfstæðan bæjarstjóra og bæjarstjórn o.s.fv. þar allavega skipulagsvaldið að vera sameinað í eina nefnd og að auki fasteignagjöld og tekjustofna í einn pung. Ég er mjög hræddur um að þegar það kemur aftur hagvöxtur í þjóðfélagið þá rísi aftur þessi mikla samkeppni milli sveitarfélaga, þetta segi ég þar sem fjárhagsstaða sveitarfélagana er svo slæm og á uppgangstímum verða þau mjög desperate að fá inn þessar tekjur af t.d. fasteignasölu og þeirri uppbyggingu/infrastructure sem þeir eru byrjaðir með núna. Þrátt fyrir fögur orð núna og að allir eru tilbúnir að búa til eitthverja sameiginlega sýn þá eru hlutirnir fljótir að breytast þegar menn fara að horfa í þennan raunveruleika sem var málið 2008. Ég er hræddur um að ef að það næðist að búa til metnaðarfullt Svæðis-/Aðalskipulag fyrir nýja uppgangstíma þá myndu menn bara byrja að keppast um að fá að breyta því aftur þegar þessir tímar koma og þá yrði öll þessi vinna fyrir bí. Þegar verktakar eða fjárfestar/atvinnufyrirtæki í hverju sveitarfélagi fyrir sig byrja að banka á dyrnar er hætta á að allt fari í sama farið og þannig er skipulagssagan á Íslandi auðvitað í hnotskurn í gegnum söguna. Pólitíkin núna er ekki að upplifa neinn þrýsting frá til að mynda verktökum og fjárfestum og þess vegna er ákveðinn samhugur núna um eitthver megin markmið, en stefnufestan verður alltaf lítil, þó sérstaklega í litlum sveitarfélögum þegar uppgangstímarnir nálgast. Það að fá eitt nýtt fyrirtæki inn í lítið sveitarfélag vegur svo mikið fyrir sveitarfélagið, Reykjavík hefur auðvitað mikla sérstöðu hvað þetta varðar þar sem sveitarfélagið er mjög stórt og mikill fjölbreytni í atvinnulífi ríkir, það að hafna einu fyrirtæki vegur miklu minna hjá Reykjavík, þannig að Reykjavík getur sýnt miklu meiri stefnufestu heldur en hin sveitarfélögin á Höfuðborgarsvæðinu. (15mín) Kópavogur og Hafnarfjörður standa mjög illa fjárhagslega núna þannig að þau eru farin að hugsa eins og "lítið" sveitarfélag sem þurfa að fá nýtt "búst" inn í sveitarfélagið.

Arnar: Hvað hefur þú að segja þá um þessa hlutverkaskipan milli Skipuleggenda, stjórnmálamanna/pólitíkusa, einkarekna fyrirtækja/verktaka og annarra á Íslandi í dag? Myndi vanta skýrari skil á milli hver gerir hvað, ættu skipuleggendur að vera meira óháðir?

Haraldur: Lögin eru þannig að við skipuleggendur eigum að vinna í hag almennings, þ.e.a.s. að við eigum að hafa almanna hagsmuni að leiðarljósi, við erum alltaf í hlutverki hálfgerðs

málamiðlara og það höfum við alveg frá í skólanum, það er það sem við lærum. Okkar hlutverk er ekki að búa til sýnina, það er fólkið í borginni sem á að móta hana og síðan eigum við að reyna að finna sáttina um uppbygginguna. Pólitíkin finnur fyrir þrýstingi frá einkaaðilunum og hlustar á íbúana og þá sem mótmæla, pólitíkin þrýstir á embættismennina og skipuleggendur og þannig kannski myndast ein heild hvað varðar skipulagsmál. En það er ekki eingöngu framkvæmdaaðilar og verktakar sem geta haft neikvæð áhrif á útkomuna í skipulagsmál, það er líka íbúarnir, þetta consept "not in my backyard", Nymbiismi getur haft mikil áhrif. Pólitíkin getur farið á taugum yfir og gefið eftir í málum þar sem 90% íbúa eru hlynntir en örfáir eru á móti. Þannig gefur að mynda að útkoman er ekki alltaf lýðræðisleg og ekki endilega sú ideal niðurstaða þar sem almannahagsmunir hafa verið í huga. Þannig að leikendurnir í þessu samspili, pólitíkin, einkaaðilinn/framkvæmdaaðilinn, íbúarnir og embættismennirnir standa frami fyrri mjög vandasömu hlutverki þar sem útkoman byggist mjög á því að embættismennirnir standi mjög á sínu og séu það öflugir að geta sannfært pólitíkina í að hafa öll sjónarmið í huga, en það hefur ekkert tekist of oft! (20mín) Reyndar er þessi meirihluti sem er nú við stjórn í Reykjavík nokkuð sérstakur!

Arnar: Eru breyttar áherslur á skipulagi Reykjavíkur eftir að Besti flokkurinn tók við borginni? Er þessi gamla barátta milli vinstristjórnar og hægristjórnar á hverfandi hveli? Er þessi nýja stjórnarskipan að hrista upp í hlutunum?

Haraldur: Auðvitað er þessi meirihlut að hugsa um að auka hagvöxt í borginni og slíkt en þessi meirihluti er ekki að hugsa um atkvæði í næstu kosningum. Ég tel hinsvegar að þessi þróun hafi verið byrjuð að gerast aðeins áður, ss sá meirihluti sem var á undan sem tók við 2006, Sjálfstæðismenn og Framsóknarmenn, voru með miklar yfirlýsingar og málefnasamningur þeirra gekk út á að Reykjavík ætti að setja meiri kraft í uppbyggingu, meiri lóðaúthlutun í t.d. Úlfarársdal og Geldingarnesi og setja kraft í uppbyggingu sem getur gefið góðar tekjur inn í borgarsjóð og laðað til sín fólk sem getur borgað háa skatta, módel sem getur alveg gengið upp en er í engu samhengi við sjálfbærni. Þetta var allt í takt við þá góðærisbylgju sem var á landinu og í heiminum á þessum tíma en þessi meirihlut lagði reyndar líka til uppbyggingartillögur á þéttingarsvæðum í Vatnsmýrinni og Örfirisey og hafði hugmyndafræði um sjálfbærari borg og þéttari borg að leiðarljósi, það var þá frekar yngra fólkið, menn eins og Gísli Marteinn Baldursson og fleiri. Ss á bak við tjöldin var ákveðin togstreita í þessu meirihluta samstarfi í skipulagsmálum. Þetta sjálfbærni viðhorf er í raun ekki flokksskipt heldur frekar kynslóðarskipt, það er að rísa upp ný kynslóð pólitíkusa sem allir eru hlynntir þessari sjálfbærni hugsun, að sporna gegn einkabílisma, og það að fá þéttari borg. Þessi kynslóð kemur fram upp úr 2006 í öllum flokkum og eftir þetta gerast þær raddir stöðugt háværari um að hægja verulega á uppbyggingu í útjaðri borgarinnar og fókusinn er settur inn á við. Þessi viðhorfsbreyting sem er tengd þessum kynslóðaskiptum gerist í raun fyrir hrun, og með því "status qua" ástandi sem er nú er hægt að setja ennþá metnaðarfyllri stefnu fram hvað varðar sjálfbærni. Þétting borgarinnar er auðvitað gamalt hugtak sem kom fyrst fram 1978, fer svo út aftur en kemur aftur inn 1984, í kringum Skúlagötuskipulagið, sem var mjög umdeilt í þeirri úthverfa uppbyggingu sem var gildandi þá (Grafarvogur til að mynda). (25mín) En stærsta breytingin milli aðalskipulaga verður fyrst í gildandi aðalskipulagi þ.e.a.s. 2001 – 2024, sem var unnið samhliða Svæðisskipulaginu, en þar kemur þétting svæða inn af miklum og markvissum krafti og fundnir ótal reytir sem hægt er að þétta, gömul iðnaðarsvæði o.s.fl. Þetta ratar allt inn í gildandi Aðalskipulag þannig að hlutfall íbúða innan byggðar er þar ca. 50% og 50% í útjaðri.

Arnar: Hvaða kosti er boðið uppá, hvað varðar byggðarstefnu borgarinnar í komandi Aðalskipulagi 2010-2030?

Haraldur: Það verður boðið upp á 4 kosti í næsta Aðalskipulagi hvað varðar íbúðir það er 100% þétting, 75%, 50% og 25%, svo var reyndar skoðað líka 0%, til þess að sjá hversu mikið land færi undir byggðarþróun ef að þetta væri 0. Það sem er í gangi núna er A kosturinn ss. 75% þétting, til að byrja með vorum við að tala um blöndu af A og B, 60% - 70%, svo núna erum við komnir í að minnstakosti 80%. Þessi vinna hefur tekið langan tíma, spólað til baka og nýtt fólk komið inn og allt það sko, en þetta hefur kannski leitt til þess, ef við bara hefðum náð að klára þetta fyrir 2008 eða eitthvað slíkt eins og var stefnt að upphaflega, það komu náttúrulega kosningar þarna, nei það komu ekki fyrr en 2010 kosningar en það voru meirihluta skipti á tímabilinu 2006 -2010 sem trufluðu vinnuna náttúrulega en þá hefðum við endað í kannski 60% eða 65%, 70% kannski en núna erum við að tala um sko miklu ákveðnari stefnu og það er í rauninni alveg þverpólitískur vilji þó að það sé eitthvað umdeilt með tímasetningu á flugvellinum. **Arnar:** En þessi 20% eru þá bara klárun á Úlfarsfelli og eitthvað í kringum Rauðavatn. **Haraldur:** Þetta er í raun minna en 20%, þetta er ef við klárum Úlfarsárdalinn sko svona sem eitt stórt hverfi sem er álíka stórt og Grafarholt, klárum Norðlingaholtið og það sem er eftir þar, Reynisvatnsásinn. **Arnar:** og þá er Ártúnshöfðinn eitthversstaðar inní þessu. **Haraldur:** Það er inní þéttingunni, og þá er þetta svona 16-17% utan við og yfir 80% hér (innan núverandi byggðar). Þetta er auðvitað háð því að við náum að flytja iðnfyrirtækin úr Ártúnshöfðanum náttúrulega og náum sem mestri uppbyggingu í Vatnsmýrinni líka fyrir 2030. En þetta er náttúrulega byggt á dálítilli bjartsýnni íbúa spá líka, þannig að við gerum ráð fyrir að meðalfjöldi íbúða sem er byggður á ári á tímabilinu öllu sé 700 íbúðir sem er bara eins og það sé uppgangstímabil megnið af tímanum og Reykjavík í rauninni sæki svolítið á miðað við hin sveitarfélögin á höfuðborgarsvæðinu og við setjum það bara fram að Reykjavík muni sækja á sko af því að áherslan á þéttingu mun aukast í heildina á svæðinu og fólk fer að hugsa meira í samgöngu kostnað þegar það velur sér búsetu og Reykjavík hefur ákveðin sóknarfæri, bestu þéttingarsvæðin eru rauninni innan Reykjavíkur og þau eru lang stærst og mest og þá mun Reykjavík í rauninni styrkja stöðu sína í samkeppninni milli sveitarfélaga þannig að í raun Reykjavík mun vaxa jafn hratt og hin sveitarfélögin þrátt fyrir að Reykjavík er lang stærst. (30mín)

Arnar: Svo að ég bakki örlítið með þig, varðandi höfuðborgarsvæðið í heild sinni, í átt að þessu sjálfbærni sjónarmiði, hvað möguleika telur þú okkur hafa, er þetta eitthver bóla, eru þetta raunhæf markmið sem við höfum sett varðandi sjálfbærni, við erum með þvílíka bíleign og bílnotkun! Hvað er mikilvægast til að tryggja þessa þróun?

Haraldur: Þetta er kannski ákveðin, það er ákveðin bóla kannski í hugmyndafræðinni akkúrat núna eða ss bóla í þessum pólitíska vilja að styðja við þessa stefnu gæti ég trúað, eins og við ræddum áðan, þegar kemur að raunveruleikanum aftur að þá fer eitthvað að gefa eftir sko og jafnvel, ég veit það ekki, við erum að setja fram tillögu núna með þessum hætti, svona metnaðarfullum markmiðum, það gætu menn farið að gefa eftir í þessari stefnu þegar það kemur þrýstingur ss að vera tilbúin með fleiri svæði í útjaðrinum í Reykjavík sem stæðust samkeppni, út af því að úthverfin í Reykjavík eru betur staðsett heldur en t.d. Vellirnir í Hafnarfirði eða Leirvogstungan í Mosfellsbæ eða eitthver slík jaðarsvæði. Svæði eins og Gufunesið í Reykjavík er t.d. mjög vel staðsett sértakalega ef Sundabrautin kemur og það eru því sjónarmið upp að það sé þá betra að íbúar Reykjavíkur leiti til slíkra svæða en við þurfum það ekki fyrir 2030 miðað við stefnuna núna. En það eru allar líkur á að það verði eitthvað reyttar fjaðrirnar af þessari metnaðarfullu stefnu, kanski ekki mikið í þessu Aðalskipulagi sem er sett fram hérna í Reykjavík en í Svæðisskipulaginu, og Reykjavík er náttúrulega stór hluti af Svæðisskipulaginu, að það er ennþá meiri hætta, þó að hin sveitarfélögin lýsi yfir að þau vilji bara vöxt inná við og hætta þessari samkeppni og útþenslu þá held ég að það sé meiri hætta þar á að verði umskipti í stefnu þar frá því sem menn eru að hugsa í dag. En eins og þú segir þá er bílaeignin mikil og það gæti í raun dregið aðeins úr henni en aðeins, menn úrelda bílana og kaupa ekki nýja og almenningssamgöngur hafa ákveðin sóknarfæri núna, það

hefur verið fjölgun núna undanfarin ár, það byrjaði reyndar fyrir hrun að fjölga í strætó, það kom nýtt sameiginlegt leiðarkerfi fyrir Höfuðborgarsvæðið, og það gekk svolítið hægt að sjá eitthverjar breytingar, en svo er kannski kerfið, komin aðeins reynsla á það, þó menn hjá Strætó séu reyndar að tala um breytingar þar, allavega núna og það er ástandið sem ýtir undir þetta og aukinn kostnaður við að reka bíl sem hjálpar til þarna og svo líka þetta nýja frá samgönguyfirvöldum ríkisins að veita peningum í almenningssamgöngur (34mín). **Arnar:** Þetta eru allavega þessi sóknarfæri sem við höfum núna. **Haraldur:** Já, þessi yfirlýsing frá Ríkinu að það verði veittur miljarður á ári næstu 10 árin í almenningssamgöngum, Ríkið er auðvitað að spara sér það, og búið að gera samkomulag við sveitarfélögin að þrýsta ekki á dýrar fjárfestingar í gatnakerfinu, þannig að Ríkið er að spara sér þar svolítið, veitir á móti þá aðeins lægri upphæð í almenningssamgöngur á móti en það hjálpar þeim, það er spurning hvernig menn nýta sér það. (35mín) **Arnar:** En eru þetta allt raunhæf markmið, hjólastefnan, almenningssamgöngur sem eru sett fram, að við náum þetta miklum metrum og kílómetrum af hjólastígum og þetta betrumbættum samgöngum? **Haraldur:** Þetta eru náttúrulega ansi metnaðarfull þessi markmið um hjólastígana og þessi þróun í hjólamálum verður áfram alveg örugglega sama hvað borgin gerir en bara miðað við núverandi stígakerfi þá mætti stórauka hjólreiðar. **Arnar:** Ertu þá að meina hjólreiðar stíga til og frá vinnu eða þessa týpísku frístunda hjólreiðarstíga? **Haraldur:** Fólk er að nota frístundarhjólastígana þannig að þeir nýtast eins og svona stofn brautir fyrir hjólreiðar en ég held að bara þessi viðhorfs og lífstílsbreyting hjá fólki muni auka hlut hjólreiða á næstu árum og að það mun ekkert draga úr því bara út af fólk er að horfa á þetta út frá lífheilsu og sparnaði líka í samgöngukostaði. Markmiðin um uppbyggingu stígakerfis eru mjög metnaðarfull og eru kannski ekki alveg raunhæf og líka markmiðin um að breyta ferðavenjum sem koma fram í loftgæðastefnu til 2050, þú getur nú skoðað það, Ríkið samþykkti loftgæðastefnu, sem Reykjavík tók líka upp, varðandi að draga úr gróðurhúsaáhrifum í samgöngum. Þar eru markmiðin mjög háleit sem þýðir að stefnan er sett á að hver íbúi komi til með að draga úr bílnotkun um 20% til 2030. Það má velta því fyrir sér hvort það sé raunhæft en hinsvegar varðandi þetta markmið um breytingar á ferðavenjum og uppbyggingu stígakerfis og svona háleit markmið, þá getur maður alltaf spurt sig að ef við setjum þau ekki svona háleit þá náum við kannski enn minni árangri. Þó að við náum ekki þessum markmiðum þá komumst við nær þeim heldur en með einhverjum lágstefndari markmiðum. En auðvitað þarf að vera ákveðið jafnvægi þarna, ef að markmiðin eru alveg fráleit þá er þeim bara stungið niður í skúffu og enginn nennir að reyna að framfylgja þeim. (39mín)

Arnar: Hvaða heilrænu breytingar þarf til í borginni til þess að hægt verði að byrja að vinna með þróun hverfa svo að íbúar þeirra séu minna háðir bílnum og notkun hans? Gæti þróun/skipulagning/breyting stórs svæðis eða heils hverfis (t.d. Ártúnshöfðinn eða Skeifan) þar sem gangandi og hjólandi umferð er í algjörum forgangi verið þess valdandi að breyta hugsanahætti íbúanna allra í borginni og kollsteypa þessari þróun sem hefur verið í gangi varðandi gengdarlausa bílnotkun?

Haraldur: Það er auðvitað eitthver uppbygging sem tekur mið af þessu sko, en þá kannski snérist þetta svolítið mikið um hvað eigi að gera ráð fyrir miklum bílastæðum per íbúð. Miðborgin er sko eina svæðið sem er með sér, eða ss hertari bílastæðareglur það er bara miðborgarsvæðið sjálft sem er mjög þröngt skilgreint, það er 1 stæði per íbúð en annars er þetta allt 1 til 2 bílastæði. (40mín)Það verður hert á bílastæðastefnunni í þessu skipulagi hér (Aðalskipulag 2010-2030) en eins og þú segir þá gæti það hjálpað og aukið tiltrú fólks á að þetta geti gengið upp að byggja upp ef við segjum bara Mýrargötu svæðið næst miðborginni sem svæði þar sem vistvænar lausnir eru í gangi og allt þetta og síðan bara ½ til 1 bílastæði á íbúð max og eitthver bílastæði á atvinnuhúsnæði sem gæti sýnt fram á að það væri alveg hægt að markaðssetja íbúðir með svona fáum bílastæðum og það væri til fólk sem myndi vilja kaupa íbúðir á svona svæði. Það myndi hinsvegar borga sig að byrja á

eitthverju svæði sem er mjög nálægt miðborginni, mjög miðlægt. **Arnar:** Ég held að til að mynda Gísli Marteinn hafi nefnt Skeifuna sem dæmi, hún er auðvitað rosalega miðsvæðis í borginni. **Haraldur:** Hún er mjög miðsvæðis reyndar, en hún er ekki alveg í þéttri borgarbyggð sko en hún er samt vel staðsett en ég held að Mýrargötusvæðið eða svæði sem eru alveg næst miðborginni að við munum byrja á þeim sko frekar heldur en að setja mjög metnaðarfulla stefnu fyrir Elliðavoginn og byggja upp 3000 íbúða hverfi þar og allar íbúðirnar eru bara með einu bílastæði það er betra að byrja hér sko (Haraldur bendir á Mýrargötusvæðið) og þá er þetta kannski að skapa tiltrúna á þetta eins og þú segir. Með smærri einingu hérna næst miðborginni alveg eins og Bryggjuhverfið sem er til í dag, þétt byggð við sjávarsíðuna, að Bryggjuhverfið er svo ílla staðsett sko það er algjörlega eitthvernegin einangrað ef þetta hefði verið byggt upp hérna við svæðið í Mýrargötu þá hefði þetta svæði alveg svínvirkað. Bryggjuhverfið var einungis byggt upp þarna af frumkvæði einkaaðila, Björgunar sem átti þetta land, sem vildi gera svona, mjög gott og kemur í rauninni ótrúlega snemma inn sko upp úr 1990, eða jafnvel fyrr. En það skiptir miklu máli að þessi strangari bílastæðapólitík að þetta sé svæði sem er vel staðsett. Skeifan getur verið það líka og við erum að horfa svolítið á, eða það er strategia sem hefur verið í hugsun hjá okkur, við köllum þetta þróunarás frá Örfirisey-keldur (sjá **Error! Reference source not found.**)hérna meðfram þessum ás, sem ekki er samfelldur í dag, það kæmi ný tenging hérna yfir sem væri bara fyrir almenningssamgöngur og gangandi og hjólandi yfir Elliðaárvoginn svo byggist upp Elliðavogshverfi hér og þessi ás myndi þvera Ártúnshöfðann.

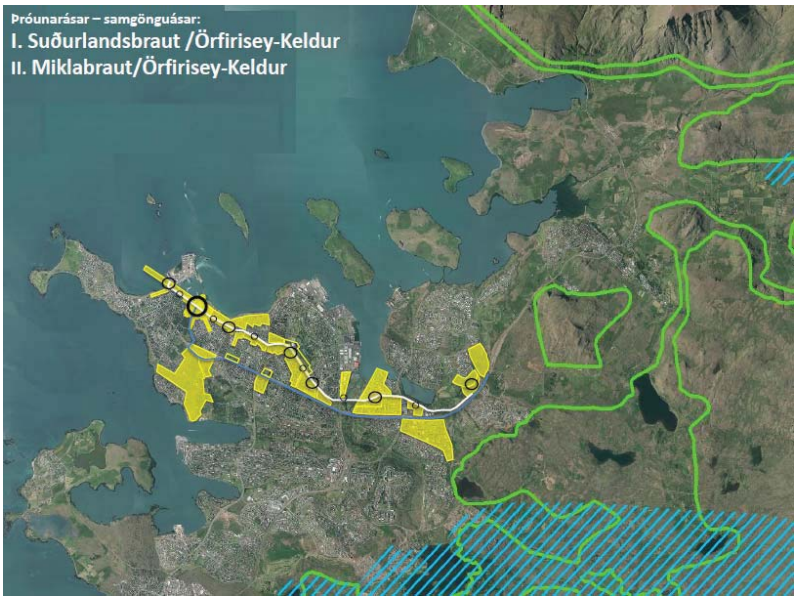


Figure 0-1: Þróunarásar-samgönguásar

Í raun sýnir þessi mynd svolítið sko að uppbyggingarsvæðin og þéttingar möguleikarnir í borginni þeir eru náttúrulega ofboðslega mikið á þessum ás hérna (Suðurlandsbraut/Örfirisey-Keldur) svona Mýrargata, Borgartún og kringum miðborgina, hugmyndirnar um landfyllinguna (SV hluti þessa samgönguás) eru reyndar væntanlega á útleið en þessi ás hérna eins og sést af myndinni að megnið af uppbyggingunni og ótrúlega stór hluti af íbúðum og störfum eru á þessum samgönguás hérna (Suðurlandsbraut/Örfirisey-Keldur). Miklabrautin er miklu veikari samgönguás útfrá þessum sjónarmiðum heldur en þessi hér (Suðurlandsbraut/Örfirisey-Keldur). Suðurlandsbrautin hefur mikla möguleika til að þróast sem eitthver breiðgata sem hluti af þessu hérna, auðvitað miðborgin hérna, Laugarvegur, Suðurlandsbraut síðan kemur Skeifan, hún hangir á þessu líka, ekki beggja megin við reyndar, en gatan, borgargatan gæti hlykkjast hérna í gegnum endurskipulagða Skeifu.

Arnar: Myndi þá Miklabrautin þá halda sinni mynd. **Haraldur:** Já Miklabrautin yrði þá bara óbreytt sko, þetta ætti ekkert að breyta mikið afkastagetu, þetta yrði bara þannig að hjóla og gönguleiðin, þetta er upplagt þannig að þú gætir hjólað svolítið eftir samfelldum stíg eftir þessum ás hérna (Suðurlandsbraut/Örfirisey-Keldur) og svo yrði sér strætisvagna leiðir sem færu fram og tilbaka eftir þessum ás hér (Suðurlandsbraut/Örfirisey-Keldur). **Arnar:** og þá sér akreinar fyrir strætisvagna. **Haraldur:** Já þá sér akrein hluta af leiðinni, þar sem það er við komið, það gæti ekki verið öll leiðin en Suðurlandsbrautin og austur gæti alveg hugsast sem slík. (45mín) Við tölum um þetta sem langtíma verkefni en bara svona ákveðin hugsun sem við viljum. Styrkleiki þessarar hugmyndar er að þarna er bara verið að endurspegla þróun sem hefur verið í gangi á seinustu 40-50 árum í rauninni en miðborgin hefur bara, þessi frjálsi markaður hefur ýtt undir að iðnaðarhúsnæði sem var þarna við Laugarveginn og síðan í Múlum og Suðurlandsbraut, þeirri hugsun var bara ýtt burt og síðan Skeifunni líka, iðnaðarhúsnæði vék fyrir verslun, verslunin mun ekki víkja af svæðinu heldur munu verslanir vera áfram á fyrstu hæð sko og þéttun byggðarinnar með skrifstofum og íbúðum á efri hæðum. Þarna er bara verið að bregðast við þróun sem í rauninni hefur verið í gangi mjög lengi og verið er að styðja og undirstrika við hana. Í Aðalskipulagi frá sjöunda áratuginum var tekin strategísk ákvörðun að hafa miðborgina þar sem hún er, en til að létta á henni og taka við ákveðinni starfsemi þá átti að byggja upp nýja miðborg hér (Kringlumýrar svæðin), sem gerð það að raunum (sökum seinkunar) að suðurlandsbrautin byggðist upp. Samfellan í borgarmyndinni er hér sko (Suðurlandsbraut/Örfirisey-Keldur), veikleiki Miklubrautarinnar, stórt svæði sem var tekið frá fyrir þennan mikla samgönguás, er að meðfram henni er skipulögð íbúðasvæði nánast, nema bara í Skeifunni og Kringlunni, annars er þetta nánast bara íbúðasvæði eiginlega allsstaðar við götuna og þú nærð ekki þessum „aðalgötu karakter“ inn í borgina. Suðurlandsbrautin hefur þennan möguleika, kannski með þessum hætti. **Arnar:** Myndir þú halda að þessi stofnbraut í gegnum Ártúnshöfðan komi til með að hjálpa Árúnshöfðanum heldur en að skipta honum í tvennt. **Haraldur:** Þetta er hugsað sem svona breiðgata, það eru byggingar fast upp að götunni svo eru það strætisvagnar, gangandi og hjólandi. Íbúðarhlutinn í Ártúnshöfðanum verður kannski meira þarna norðan við og svo áfram fjölbreitt atvinnustarfsemi að hluta. Þetta svæði er auðvitað mjög lifandi og mikil starfsemi, það má ekkert fara að skipuleggja það í burtu einn, tveir og þrír enda viljum við ekki að menn fari í eitthverja spákaupmennsku á húsnæði hérna snemma, um leið og búið er að setja miðsvæðis lit yfir þetta svæði, þar sem er hærri nýtingu og skrifstofur og allt þetta, þá fara menn að kaupa upp nánustu verkstæði og sjá möguleikana í eitthverjum hagnaði þar. **Arnar:** Við sjáum að Ártúnshöfðinn spilar auðvitað mikilvægu hlutverki í framtíðinni. **Haraldur:** Já, náttúrulega líka vel staðsett svæðisskipulega séð. (50mín)Þarna er mjög eftirsótt byggingarland og mikil veðursæld fyrir íbúðabyggð. Svæðið stendur því ekkert og fellur með þessari stofnbraut en ef að henni skal verða er mikilvægast að hún komi sem allra fyrst. Erfiði hlutinn af þessari stofnbraut er náttúrulega að það þarf að framlengja suðurlandsbrautinni og munu íbúarnir þar ekki fagna þessu en það yrði þá strætisvagnagata hérna yfir og yrði það best að hún komi dálítið samhliða þessari uppbygginu hér (held að hann eigi við Mýrargötuna) til þess að venja fólk við þær samgöngur sem verða í framtíðinni þarna. En þetta er náttúrulega samt sem áður svæði sem ekki er alveg, það er þónokkur vegalengd hérna niður í bæ sko og þetta verður blandað svæði, en það þarf að tryggja góðar almenningssamgöngur hérna strax og bílastæðakröfurnar verða öðruvísi heldur en á öðrum svæðum. Þetta er samt sem áður svolítið svæði, það sem menn hafa verið að benda á, að áhættu þættirnir í þessu að þetta er, er markaður fyrir íbúa á þessu svæði, í svona þéttri byggð þar sem þú ert með 1 bílastæði á íbúð eða minna, er stór markaður fyrir slíkar íbúðir meðal fólks í dag. Yngra fólk og það fólk sem kýs slíkan lífsstíl, finnst þetta væntanlega of langt í burtu frá miðborginni. Þannig að þetta er svona, það getur verið að maður verði að hafa svolítið blandaða leið hérna, að þéttleikinn verði ekki alveg svona mikill kannski og ekki bara svona einhæf/þétt randbyggð og allt það. Það er nánast sama hugmyndafræði í gangi hér og fyrir þessi hverfi hér (held Mýrargata og Vatnsmýrin) þetta er

auðvitað miklu nær miðborginni og nálægt þessum háskólum og Landsspítalanum og allt það sko, þannig að sú hugmyndafræði sem er í gangi þar gengur alveg upp en það er spurning með hvort hún virki líka fyrir Ártúnshöfðan. Það er líka verið að velta upp að ef við markaðssetjum þetta svæði (held Vatnsmýrin), við getum ekki sett þau bæði í einu, ef þetta væri boðið upp á sama tíma og þetta hér (Vatnsmýrin og Ártúnshöfðinn), auðvitað væri þetta hér ódýrara (Ártúnshöfðinn) en þetta væri dýrara væntanlega (Vatnsmýrin), það væri bara ekki skynsamlegt að stilla þeim upp á sama tíma.

Arnar: Er það Vatnsmýrin eða Ártúnshöfði sem er það næsta, nú hefur verið talað um Ártúnshöfðan sem nýjan miðbæjar kjarna eða nýtt centrum, talað hefur verið um hvort ekki eigi að setja Landspítala háskólasjúkrahús á þetta svæði?

Haraldur: Að mínu vit þá er þetta ekki gott svæði fyrir spítala sko, en sko þessi hugsun um að búa til nýjan miðbæjar kjarna, það er auðvitað hægt að segja að hann (Ártúnshöfðinn) sé hugsaður þannig, hann er náttúrulega mjög öflugur þessi kjarni og verður það alltaf, bara í almenni verslun og þjónustu og svo styrkt með skrifstofum og íbúðum en hugsunin er að okkur liggur ekki á að fá allt þetta svæði í rauninni, við eigum nóg með þetta hérna(Mýrargatan), við þurfum að klára þetta hér í Mýrargötunni og þróa miðborgina. Þetta er allt inn á skipulagstímabilinu (til 2030) en á seinnihluta tímabilsins bæði þessi svæði hér (Ártúnshöfðinn og held Vatnsmýrin). Forgangsröðunin er þannig að þessi svæði hérna (Mýrargata) eru fyrst, við viljum klára skrifstofu svæðin hér, klára auðu reitina sem eru hérna í miðborginni og allt í kringum miðborgina og þessum reitum sem eru í jaðri hennar, Mýrargötuna, og þróa miðborgina í átt að Örfirisey. Auðvitað getur sumt af þessu gerst á sama tíma allt saman en síðan er náttúrulega eðlilegt að horfa á það þannig að ný skrifstofu hverfi, öflug stór ný skrifstofuhverfi sem tækju þá við af Borgartúninu sem er komið svolítið langt í uppbyggingu, þá kæmu þau (nýju skrifstofuhverfin) hugsanlega hérna bara í Síðumúlasvæðið, sem hefur mikla möguleika og svo Skeifan. (55mín) En hinsvegar þá verður þetta allt saman inn á tillögunni en tillagan þarf að vera mjög skýr varðandi forgangsröðun uppbyggingar.

Arnar: Nú talar þú um skrifstofu svæði, en hvað þá með iðnsvæðin, hvert eiga þau iðnfyrirtæki sem eru í Ártúnshöfðanum nú að flytjast, fyrst var talað um Geldingarnesið, hvað er planið núna, er það Álfsnesið?

Haraldur: Já! það er Álfsnesið. **Arnar:** Verður Álfsnesið ekki í framtíðinni það sem Geldingarnesið var fyrir 10 árum, ss nú er Geldingarnesið gott byggingaland og það væri sóun að hafa iðnfyrirtæki þar! **Haraldur:** Geldingarnesið var hugsað sem svona alhliða skipahöfn, mjög öflug höfn, sem tæki jafnvel við vöruflutningum, það hefði getað létt á þessu svæði hér (svæði nr:1 á **Error! Reference source not found.**). **Arnar:** Það er alveg hætt með Eiðsvíkina er það ekki, eftir að Faxaflóahafnir voru stofnaðar? **Haraldur:** Jú, þetta er besta hafnar, það er auðveldast að gera nýja höfn hérna (svæði nr:2 á **Error! Reference source not found.**). **Arnar:** En þetta er líka verðmætt land, eins og Hrólfur Jónsson sagði mér, varðandi efnistöku og slíkt! **Haraldur:** Jú, líka það sko, það eru ákveðin tækifæri sem menn voru að hugsa, auðvitað er þetta fallegt svæði, þetta er hérna við sundin og menn sjá þessa röskun sem verður á Geldingarnesinu sem gerir það að verkum að, já þetta var kastað út af skipulagi. Hinsvegar ef við myndum aftur opna fyrir þetta svæði hér (svæði nr:3 á **Error! Reference source not found.**) sem ég tel ekki líkur á að verði gert aftur með hafnarsvæði svona, þá getur þetta (svæði nr:3 á **Error! Reference source not found.**). leyst þetta svæði hérna af (svæði nr:1 á **Error! Reference source not found.**). og það eru tækifærin, finnst mér. Sundabrautin kemur svona (eins og teiknuð er í **Error! Reference source not found.**) eins og er á skipulagi og alltaf í hábrú því skipin (sem þurfa að fara inn á svæði nr:1 á **Error! Reference source not found.**) þurfa að sigla hérna undir, en ef þessi starfsemi hérna (frá svæði nr:1 á **Error! Reference source not found.**) yrði flutt hingað þá þyrfti bara lágbrú, miklu ásættanlegra mannvirki

heldur en Sundagöng og ódýrari heldur en Sundagöng. **Arnar:** Hvað telur þú að sé verið að fara að gera, er það Sundagöng eða brú. **Haraldur:** Það er svo mikil óvissa um þetta þó að sé eitthverstaðar samþykkt um það að það sé eindregin vilji borgarstjórnar um það að styðja Sundagangalausnina. Síðan gerist náttúrulega eftir það bæði náttúrulega efnahagshrunið og síðan kemur ný kostnaðaráætlun, endurmat á framkvæmdinni sem var miklu hærri, hún hækkaði eitthvað um 10 milljarða, upp í 27 milljarða og var orðin dýrari en hábrú eiginlega sko. Sundagöng gera líka voða lítið fyrir borgarmyndina, brú getur náttúrulega sett svip á borgina og lágbrú gæti verið mjög ásættanleg lausn ef við getum endurskipulagt hafnarsvæðið hér fyrir innan (svæði nr:1 á Figure 2). Það hefur líka verið rætt, en Faxaflóa hafnir eru mjög íhaldssamir í þessu öllu saman og erfitt að eiga við þá, en uppskipun fyrir Samskip, sem er hérna innan við (svæði nr:1 á Figure 2) yrði fyrir norðan brú og síðan yrði bara keyrt undir brúna með vörurnar, gámana. Það hefur í rauninni verið rætt aðeins en tillagan í nýja aðalskipulagi í þessari legu (sjá á Figure 2) og við höldum henni þrátt fyrir að íbúarnir hérna tali alltaf um Sundagöng, en Vegagerðin myndi aldrei styðja Sundagöng lausnina, þeir kosta þetta. Á meðan að það er ekki komin niðurstaða í málið þá verðum við bara að halda okkur við núverandi legu. **Arnar:** En hvað heldur þú að gerist á þessu tímabili 2030. **Haraldur:** Það eru svo margir sem tala núna um að Sundabrautin komi ekki neitt á næstunnin, þetta er dýr framkvæmd. **Arnar:** Hvaða áhrif hefði Sundabrautin á til að mynda Ártúnshöfðan og t.d. Mosfellsbæ? **Haraldur:** Þetta verður alveg klárlega inni á skipulagstillögunni í nýja skipulaginu og þetta er náttúrulega svæðisskipulagsmál, þó að þetta sé eingöngu innan Reykjavíkur, þetta hefur náttúrulega áhrif á Mosfellsbæ, þjóðvegurinn er að fara út úr Mosfellsbænum með tilkomu Sundabrautar en ég held að, þeir auðvitað missa eitthverja þjónustu möguleika hérna en þeir fá miklu auðveldara að skipuleggja bæinn þegar þessi mikla umferð er farin út úr honum. (1klst) Álfsnesið á ss að létta á iðnaðarsvæðunum í Ártúnshöfðanum en hinn möguleikinn er auðvitað að hafa þetta bara opið. Iðnaðarsvæðin gætu til að mynda bara farið til Hafnarfjarðar, iðnaðarsvæðin við Straumsvík, í hrauninu þar og jafnvel inn í Hafnarfjarðarhöfnina. Þeir eru með iðnaðarhöfn þarna utarlega í Hafnarfjarðarhöfn. Þeir hafa verið tiltölulega jákvæðir að fá ný fyrirtæki inn en ég veit ekki hvað íbúarnir í Hafnarfirði segja. Þannig að þetta verður nú stillt upp þannig að þetta svæði (svæði nr:4 á Figure 2) er sýnt sem möguleiki en þetta er erfitt, þetta er auðvitað við innkomuna inn í borgina ef að Sundabrautin kemur hér. Þá þarf að sprengja niður landið til að gera höfn, þó nokkuð mikið inngrip í landið og verður alltaf umdeilt. En við myndum sýna þetta sem möguleika til að taka við Björgun og að tryggja það að þetta er mögulegt skipulega séð en svo verður bara að koma í ljós hvað ákvörðun þeir sem reka fyrirtækin taka. Þeir eru kanski ekki tilbúnir að koma hérna uppeftir fyrr en Sundabrautin er komin, þetta er svo langt í burtu annars. Þetta verður allavega inná tillögunni og hangir svolítið á að ná að framfylgja stefnu um blandaða byggð hér (Ártúnshöfðinn).

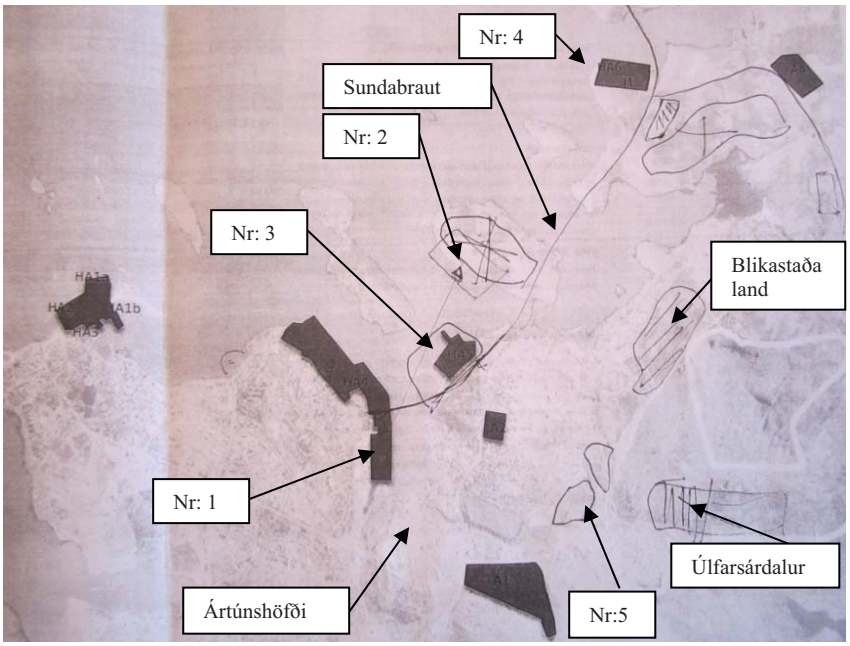


Figure 0-2: Sérhæfð atvinnusvæði til ársins 2030

Arnar: En hvaða faktora, í skipulagsmálum á höfuðborgarsvæðinu, eru hvað þýðingamestir hvað varðar framtíðar uppbyggingu Ártúnshöfðans? Er Sundabrautina krítískt varðandi þetta eða þessi braut sem þú ert búinn að nefna, sem á að þvera Ártúnshöfðan? Eða eru það eitthverjir aðrir faktorar sem þú ert ekki búinn að nefna?

Haraldur: Fyrirtæki eins og Hringrás (í sundahöfninni), starfsemi sem þrífst ílla í nálægð við aðra byggð, Björgun, Malbikunarstöðin. Þetta eru svona þessi þrjú sem menn vilja helst fyrst losna við steypustöðvarnar þurfa ekki endilega að vera nálægt höfn, þær vilja reyndar vera nálægt Björgun og það vill Malbikunarstöðin líka en þær í rauninni gætu farið eitthvað annað. **Arnar:** Það væri auðvitað rosalegt fyrir t.d. steypustöð að fara úr Ártúnshöfðanum og alla leið upp í Álfsnesið og þurfa að fara alla þessa leið! Þessi flutningur gæti því verið nokkuð háður Sundabrautinni.
Haraldur: Já þetta myndi auðvitað hækka verðið á steypu, það er í raun búið að skoða allt þetta. Ef við horfum á uppbyggingar svæðin á Höfuðborgarsvæðinu þá er náttúrulega fjarlægðin við þau úthverfi sem voru planlögð, blönduð byggð í Geldingarnesi til að mynda ekki svo langt á milli, Álfsnesi og Geldingarnesi. Blikastaðalandið er óbyggt líka sem er á milli Reykjavíkur og Mosfellsbæjar (sjá á Figure 2). Svo eru suðursvæðin í Hafnarfirði en það eru aðrar steypustöðvar sem þjóna þeim. Þannig að staðsetningin væri ekki svo slæm ef við myndum svo líka bæta Úlfarsárdalnum (sjá á Figure 2) við en þessi svæði eru ekkert inná skipulaginu, nema þá að hluta til eins og með Úlfarsárdalinn. (1h5mín) Þetta var reiknað út (þessi flutningur iðnfyrirtækja upp í Álfsnes) af VSO ráðgjöf og aukinn flutningskostnaður var miðaður við þróun uppbyggingu hérna norðurssvæðum Höfuðborgarsvæðisins, að stór hluti af byggingarsvæðunum væru hérna norðarlega þannig að þetta væri ekki eins slæmt. En nú hefur það breyst að áherslan á þéttingu hefur aukist þannig að þessi svæði (Geldingarnes, Úlfarsárdalurinn og kannski Blikastaðalandið) eru dottin út. Þannig að staðsetningin hérna (á Álfsnesi) hefur versnað og líka frestun á þessum svæðum hérna (norður svæðin), sérstaklega þetta svæði hér (Geldingarnesið) og möguleikum á blandaðri byggð hérna í Gufunesinu (svæði nr:3 á Figure 2) eins og var talað um eitthverntíman. Það dregur úr líkunum á að maður byggi Sundabrautina yfir höfuð, allir arðsemisútreikningar, sem komu ágætlega út í rauninni voru byggðir á því að maður væri að stytta vegalengdir hjá fólki sem byggi hér (Gufunes, Geldingarnes, Álfsnes). En nú er það ekki lengur inní myndinni þannig að nýir arðsemi

útreikningar fyrir Sundabraut koma í rauninni mjög ílla út þegar maður horfir svona 20 ár fram í tíman. **Arnar:** Er ekkert að fara að gerast í Geldingarnesinu, eins og þú segir næstu 20 árin? **Haraldur:** Það er ekkert eins og stefnir í dag, það verður bara kláraður þessi hluti af Úlfarsárdalnum sem þegar er byrjað á. En Reykjavík þarf kannski að vera, og það hefur kannski ekki verið mikið rætt eða sumir hafa verið að benda á það að Reykjavík þarf að hafa eitthvað vara plan ef þéttingin er háð meiri óvissu. Það er minni fyrirstaða að byggja upp á opnum svæðum í eigu sveitarfélagsins heldur en innanbyggðar. Ef allt klikkar og fólk vill sjá vöxt í Reykjavík þá mun Reykjavík dragast afturúr ef það eru engin önnur svæði, við erum með Keldnalandið (svæði nr:5 á Figure 2) hérna sem verður væntanlega inni, en í rauninni ætti þetta alveg að geta gengið upp.

Arnar: Svona ef við bökkum aðeins, hver er þá aðal ástæða fyrir þessu nýja Aðalskipulag, er það pólitísk pressa (krafa frá stjórnmála flokkunum/nýjar stefnur stjórnvalda eða eru úreldar hugmyndir í því gamla) eða er það út af reglugerð um endurskoðun skipulaga á 4 ára fresti eða er bara hrein þörf fyrir þessu?

Haraldur: Við erum eiginlega búnir að vera endurskoða stöðugt, með svona hléum, en formleg ákvörðun um endurskoðun er tekin sumarið 2006. Vinnan hefst ekki fyrr en 2007. **Arnar:** Þetta er ss ekki til þess að Besti flokkurinn vill búa sér til eitthvað fyrir næstu kosningar? **Haraldur:** Nei, en þeir taka bara við þessari vinnu og allur þessi meirihluti sem er búinn að vera þarna í millitíðinni þeir héldu bara áfram vinnunni. Það er mjög langur vegur frá fyrstu ákvörðuninni, sem var ekkert rökstutt neitt rosalega mikið, nema með vísun í málefnasamning þessa meirihluta sem tók við 2006. Það hefur svo margt gerst síðan þá að við getum varla kallað þetta sama verkefnið. Þó að það sé reyndar samfella, sama fólkið búið að vera að vinna við þetta svolítið. **Arnar:** Þessi rígur milli stjórnmálaflokka er kannski ekki eins mikill í dag og til að mynda þegar allt fór í hund og kött þegar Úlfarsárdalurinn og Rauðavatnið var að byggjast og stjórnmálaflokkarnir hentu frekar 4 ára skipulagssögu út um gluggann heldur en að samvinna? **Haraldur:** Þetta er liðin tíð, þessi flokkspólitíska sýn, Geldingarnesið var kannski seinasta dæmið, Eiðsvíkin var algjört princip að það yrði íbúðabyggð þar, en Sjálfstæðismenn höfðu reyndar áður sýnt sko höfn þarna og Höfnin á um 80 hektara land þarna eða eitthvað slíkt. Þannig að Höfnin vildi alltaf fá höfn hingað (Eiðsvík), en síðan sýndu athuganir á að þeir þurftu ekkert. En Geldingarnesið var svona síðasta dæmið um svona alveg klárt pólitískt, flokkspólitískt mál og er í rauninni ennþá viðkvæmt. Ef við tækjum það upp núna, ef Besti flokkurinn og sú stjórn myndi taka upp að breyta ekki skipulagi þarna að hafa bara höfnina áfram, hún er reyndar ennþá inn á gildandi Aðalskipulagi, þá myndi vakna upp eitthvað úr fortíðinni og afstaðan myndi kannski mótast af þessu fyrra viðhorfi. (1h10mín)

Arnar: En hver er þá þín framtíðarsýn til 2050, verður ekki byggt austar, verður Vatnsmýrin komin alveg, sameining sveitarfélaga?

Haraldur: Mín sín er kannski, varðandi flugvöllinn, að það hafi farið svolítið mikið púður í flugvallarumræðuna. **Arnar:** Ertu ánægður með þessa tillögu sem vann? **Haraldur:** Hún er svolítið stíf, grunn gatnakerfið er kannski eitthvað sem við eigum að horfa á, þar sem þetta byggist upp á löngum tíma þá þarf að vera ákveðinn sveigjanleiki, við megum ekki ríghalda í eitthverja sýn sem var mótuð á eitthverjum tímapunkti. Varðandi flugvöllinn að hann geti hugsanlega verið út lengst af skipulagstímabilinu. En við eigum að einbeita okkur að þessu svæði hér (Mýrargatan), styrkja það og þétta í tengslum við miðborgina og reyna að klára þessi svæði og ekki fara of snemma í að blása upp væntingar um Skeifuna t.d. Þannig að það dragi kraftinn úr þessu hér (Mýrargatan), þannig að spákaupmennska með húsnæði þarna (held Skeifunni) og eins og með þetta svæði hér (Ártúnshöfðinn) sko að þarf að passa aðeins uppá þennan hluta hérna (væntanlega er hann að tala um sá hluti Ártúnshöfðans sem öll verkstæðin eru á). Þarna eru reyndar verktakarnir búnir að kaupa,

Klasi og fleiri eru búnir að kaupa upp stóran hluta af þessu svæði. **Arnar:** Þar sem Klasi til að mynda er farinn í ákveðan skipulagsvinnu varðandi Ártúnshöfðan þá eru þeir í rauninni að spekúlera í þessu svæði varðandi framtíðaruppbyggingu borgarinnar. **Haraldur:** Já það sem er kannski búið að gerast þarna er að væntingarnar um svæðið voru skapaðar með gildandi Aðalskipulagi þannig að öll þessi uppkaup eru yfirstaðin. Klasi á til að mynda slatta þarna, þó að Klasi hugsi kannski ekki svona þarna. Þeir eru í eru í raun að reyna að klára dæmið, þeir eru í samstarfi við verktaka, en þessi þróunarfélög, eru náttúrulega svolítið, mörg hver hugsuð þannig að þú sérð tækifærin og grípur þau og fjárfestir í þeim og svo vinnur þú í pólitíkinni að breyta skipulaginu og allt það og svo getur þú haldið áfram með það sjálfur ef þú trúir meira á það eða selur það. En það var kannski aðallega hérna á miðborgarsvæðinu þar sem það var svona púra spákaupmennska, líka uppkaup á eignum úti í Örfirisey. Væntingarnar þar voru líka blásnar upp í kringum 2007. (1h15mín)

Arnar: Flugvöllurinn, hvert sérðu að hann geti flutts í komandi framtíð?

Haraldur: Það sem við erum að nálgast í Aðalskipulaginu er sama nálgun og er í Svæðisskipulaginu að við erum ekki að tefla fram nýjum valkosti inna Höfuðborgarsvæðisins. Löngusker eru eiginlega útilokuð út af að Seltjarnarnes myndi alltaf mótmæla og Álftanesið líka og Kópavogur jafnvel. Hólmsheiðin kemur til greina, það er að hluta til innan Mosfellsbæjar, þeir eru sennilega ekkert á móti honum en það myndi sennilega heyrast í eitthverjum þar. Íbúar hérna í Grafarholti, Norðlingaholt og Selásnum myndu mótmæla mjög harkalega gagnvart flugvelli á Hólmsheiði. Þó að þeir hafi óveruleg áhrif miðað við áhrifin sem eru hér (Mosfellsbær). **Arnar:** Staðsetning flugvallarins þarna á Hólmsheiði gæti svo aftur orðið til trafala þegar maður lítur fram um til að mynda 100 ár. **Haraldur:** Já, já hann gæti orðið aftur vesen og yrði alltaf umdeildur þannig að menn tala svona mest um Keflavík. Það eru náttúrulega mikil tækifæri að sameina innanlandsflug og utanlandsflug á einn stað í svona litlu landi eins og Íslandi. Höfuðborgarsvæðið gæti náttúrulega goldið eitthvað fyrir það en það eru náttúrulega önnur tækifæri sem koma í staðin. Aðallega nemendur og opinberir starfsmenn, komandi af landsbyggðinni gætu einnig goldið fyrir þessa breytingu. Ég sé samt fyrir mér að flugvöllurinn hljóti að fara á endanum, það er ennþá óvissa um hvert hann fer en Keflavík er líklegast. **Arnar:** Það er þá allavega ekkert fast ákveðið í þessum málum frekar en í gildandi Aðalskipulagi? **Haraldur:** Nei, það er rétt.

Arnar: En Landspítalinn (Landspítali Háskóla sjúkrahús) hvað er málið með að stefna honum og öllum þessum störfum þarna niður eftir, á spítalinn heima þarna niðurfrá?

Haraldur: Til að byrja með þá eru þetta bara störfin í Borgarspítalanum sem fara þarna niður eftir og af hinum og þessum stöðum í borginni. Hagræðingin að sameina spítalana á einn stað hlýtur alltaf að vera mjög rökrétt, þetta er náttúrulega á 30-40 stöðum í dag víðsvegar um borgina. **Arnar:** En samkvæmt stofnkerfinu og bílastæðum og annað? **Haraldur:** Ég held að þetta svæði þoli alveg að taka við þessum starfsmönnum sem eru núna, þú ert í rauninni bara að taka við, eins og þetta er reiknað út til að byrja með, fyrstu 10-20 árin, þeim störfum sem eru að fara á vakt kl:8 á morgnana í Borgarspítalanum. Þau bætast við umferðina á hringbrautinni, það verður ekki katastrófa af því! Svo frekari uppbygging á svæðinu gerist náttúrulega hægt og bítandi vonandi náum við að byggja upp fleiri svæði hérna í kring. Megin röksemdin fyrir Reykjavík er að náttúrulega er Fossvogssvæðið líka mjög erfitt umferðalega séð, það eru mjög erfiðar lausnir þarna. Landspítalasvæðið er náttúrulega tengt eftir Miklubraut, Hringbraut, Bústaðaveginum, Snorrabraut og Sæbrautinni. Svæðið er einnig nálægt miðborginni, stutt í það svæði (miðborgin) þar sem slysatíðnin er hæst og allt það. Sjúkrabílar hafa alltaf forgang á götum, það er náttúrulega erfiðara í þéttri umferð en bráðamóttakan er núna hérna við Borgarspítalann en þetta er að færast innar í

borgina. Strategísk ákvörðun fyrir borgina, af því að það var náttúrulega talað um að hann færi jafnvel út fyrir borgina og það hefði verið áfall fyrir borgina að missa þetta út úr (þarna stoppaði hann en meinti væntanleg út úr sveitarfélaginu) (1h20mín) **Arnar:** En það hefði ekkert komið til greina að setja nýjan spítala í Elliðaárdalinn? **Haraldur:** Það var reyndar aldrei talað um það, það var talað um Keldur, en Elliðaárdalurinn hefur alltaf verið mjög erfið staðsetning, þú sérð bara hvernig samgöngu tengingar eru við Bryggjuhverfið í dag, auðvitað er hægt að bæta þær, en þær yrðu aldrei auðveldar, þetta er botnlangi. Á núverandi stað er þó tengdu í allar áttir margar leiðir að svæðinu. **Arnar:** En þyrfti ekki miklar breytingar á akkúrat þessum leiðum, nú er t.d. verið að tala um gangnagerð og slíkt. **Haraldur:** Jú, jú og Öskuhlíðargöng, ef Vatnsmýrin byggist upp þá munu væntanlega Öskuhlíðargöng koma. **Arnar:** En hvað ef við lítum á bæjarmyndina, vill maður hafa stærðarinnar sjúkrahús í fallegu hverfi og miðbæjarmynd? **Haraldur:** Þetta er auðvitað í jaðri miðborgarinnar, ef maður horfir á svæðið eins og það er í dag, þá er ekki mikil bæjarmynd á þessu svæði í dag. Þú getur náttúrulega hugsað þér miklu betri og flottari byggð þarna en þetta er spítali og hann verður alltaf eitthver megastruktur þó að hann þurfi ekki að vera alvega svona stór eins og þeir eru að gera þarna en ásýnd svæðisins mun batna þrátt fyrir þetta í mínum huga. Við erum búin að færa hringbrautina, við erum með þessa hraðbraut hérna (væntanlega að tala um brautina við umferðamiðstöðina) svo er þessi sýn um að byggja meðfram hringbrautinni og þá lokar þú svolítið af þessa strúktúra hérna og byggingarnar þarna meðfram munu þá aðlagast meira byggðinni hérna í vatnsmýrinni. Í mínum huga áttu að horfa á þetta útfrá núverandi spítala og svo aðlögun að Hringbrautinni og þeirri byggð sem er áætluð í Vatnsmýrinni í framtíðinni. Það er fráleitt að bera þetta saman við eitthvað eins og eitthver er að gera í auglýsingum, að segja að Landspítali í Þingholtunum, og svo eru menn að tala um Skólavörðuholtið en það er kannski jaðarinn á skólavörðuhæðinni. En þannig hefur áróðurinn verið og formaður íbúasamtakana í miðborginni, Magnús Skúlason, á að vita betur. En þetta verður aldrei vinsælt. (1h25mín) **Arnar:** En þú telur allavega að stofnkerfið þoli þetta? **Haraldur:** Það ætti að gera það, það er hægt að gera eitthverja umferðarspá sem reiknar með alveg svakalegri aukningu á umferð ef enginn breytir ferðavenjum og þá náttúruleg verður mjög þungt. En teppurnar eru á svo afmörkuðum tíma á morgnana, það hlýtur að segja okkur að það séu tækifæri til að stjórna umferðinni betur og ef þetta snýst um að fá Háskóla Íslands til að byrja korteri seinna á morgnanna, eða Háskólann í Reykjavík það myndi alveg vega upp á móti fjölgun starfa í Landspítalanum, bara eitthver svoleiðis aðgerð gæti ég trúað. **Arnar:** Það þarf því stærri breytingar til og það þurfa fleiri að koma að til að minka álagspunktana eða lengja álagstímann! **Haraldur:** Já, en það verður ekki bara allt í einu eitthver katastrófa þarna, þetta er fyrst og fremst aðeins störfin í Borgarspítalanum, sem bætast þarna við. Svo er þetta ekki nettó fjölgun á störfum í borginni ekki til að byrja með, og jafnvel fækkun starfa því það er meiri hagræðing. Þannig að fjölgun starfa hérna á nesinu, ef við ökum nesið í heild (Reykjanesið) verður sá sami. En umferðin færist þá meira hingað (bendir á Miðbæjarsvæðið og vísindagarðana) og svo erum við auðvitað að byggja upp Vísindagarðana og Háskólann í Reykjavík og meira í Háskóla Íslands, þannig að það er klárt að aukast mikið álagið hér (ss á þessu svæði). Þannig að það er eðlilegt að vera viðbúin öllu þessu en að mínu mati þá er ekki nein stór hætta á ferðum.

Arnar: Hver er stefnan í almenningssamgöngum, er enn verið að tala um léttlestakerfi, eiga almenningsvagnar að vera með eina akrein, er kannski möguleiki á að búa til mobilt metrokerfi úr strætóum?

Haraldur: Sú hugsun er alveg í gangi þar sem því er viðkomið, léttlestakerfið er kannski ekki eins mikið inni í myndinni núna. Þetta kerfi var dregið upp í mjög grófum dráttum í gildandi Aðalskipulagi, við vildum ekki setja það inn en svo vildi pólitíkin hafa þetta með. Það hafa verið gerðar athuganir síðan þá, við horfum á þetta sem strætisvagnakerfi. Við viljum hafa meginleiðir strætisvagna inní Aðalskipulagi en strætó vill það ekki, því þá þarf að breyta Aðalskipulagi ef það

verður eitthver umbylting a leiðarkerfinu. Mér finnst það svolítið mikilvægt að það sé ekki auðvelt að gera umbyltingu á kerfinu án þess að fara í eitthverja lögformlega kynningu á því. Reglugerðin segir að það eigi að gera grein fyrir skipulagi almenningssamgangna, þó að þetta sé í rauninni bara að keyra eftir götunum og ekki sporbundin. Strætó hefur verið að pæla í nýrri skiptistöð niðri í BSÍ síðan færi minni vagnar hringleið inní miðborginni. Það sem er verið að reyna svona nýtt physiskt í kerfinu er tengingarnar yfir Elliðavoginn og svo þegar Vatnsmýrin eða Flugvöllurinn líkur, eða jafnvel fyrr, það hefur verið rætt við Kópavog, að fá tengingu þar yfir. Þetta yrði þá kannski tenging fyrir gangandi, hjólandi og strætisvagna og þá yrði háskólinn í Reykjavík ekki lengur í þessum botnlanga. Við erum með ákveðnar meginleiðir í gildandi Aðalskipulagi og við sínum nýja mynd sem er með eitthverjum þessum áherslum. Við viljum leggja áherslu á þessa stofnæð hérna (sjá Suðurlandsbrautar ásinn **Error! Reference source not found.**), strætó hefur reyndar verið meira að hugsa um þessar stóru stofnæðarnar, þeir sjá ekki endilega fyrir sér eitthvern áhersluás hérna (sjá Suðurlandsbrautar ásinn **Error! Reference source not found.**). Við erum að benda á möguleikana að þétta byggðina hérna og fjölga íbúðum og störfum eitthverja 200 metra frá eitthverji strætisvagnalínu. Þannig að við höldum því á lofti en skipulag/leiðarkerfi strætó bs leggjum við ekki beinlínis neinar breytingar til en það þarf náttúrulega allt að vera sveigjanlegt. En með því að festa svona mynd inn í Aðalskipulag þá viljum við líka festa það svolítið í sessi, eins og segir, sporbundið kerfi er miklu fastara í sessi og maður breytir því ekki svo auðveldlega, fólk getur þá treyst því að það verði bara áfram svoleiðis en í leiðarkerfi venjulegra rútubíl, þá er alltaf hætta á því að maður kaup húsnæði nálægt, ef þú hugsar þannig hér á íslandi sem að menn gera ekki mikið en gera það mikið erlendis að kaupa nálægt eitthverji stöð. Hérna (með svona plani) getur þú keypt nálægt eitthverri stöð sem á að vera með góðum leiðum, fyrir annan makann, en hérna (ef þetta er ekki fest í sessi) getur þú bara misst það. Það er ákveðin hugsun að reyna að festa það og það er reyndar gert í gildandi Aðalskipulagi að festa þetta kerfi í sessi. Sem tryggir svolítið rétt notenda.

Arnar: Er það sama með hjólreiðar?

Haraldur: Jú, það verður alveg sér kafli um hjólreiðar (í nýja Aðalskipulaginu), áður var þetta svo mikið blandað saman, það verður sér kort með hjólreiðakerfinu þótt að það skarist á við göngustígana á mörgum stöðum, en þá verður þetta sýnt aðskilin. Það er komin hjólreiðaáætlun, Hjólaborgin Reykjavík, sem þú ættir að kynna þér. Við höldum henni á lofti en við höfum aðeins verið að endurskoða hana inni í hverfunum.

Arnar: Er eitthver breyting á hvernig almenningur kemur inn í skipulagsvinnuna?

Haraldur: Já, það er svona í tengslum við síðustu kosningar 2009-2010, þegar þetta var í fullum dampi, þá fórum við í mikið samráðsferli í hverfunum, héldum fundi í 10 hverfum borgarinnar. **Arnar:** Var það fyrst þá sem slíkt var gert? **Haraldur:** Já, að fara með Aðalskipulagið í hvert hverfi borgarinnar og útkoman úr því ýtti undir þá ákvörðun að setja Aðalskipulagið fram hverfi fyrir hverfi, þannig að þegar við kynnum formlegu tillöguna þá er hún kynnt, og það ætlum við að gera núna fyrir áramót í hverju hverfi fyrir sig. Þetta er gert út af því að fólk hefur ekkert áhuga á Aðalskipulagi borgarinnar í heild sinni endilega þó auðvitað getur það verið líka, en þannig fókuserum við á breytingarnar í viðkomandi hverfi. Það hefur síðan verið samráðsfundir með hagsmunaaðilum, sér vinnufundir þennan vetur en síðan höfum við bara verið í að vinna tillöguna áfram fyrst með nýjum meirihluta í fyrra og núna erum við komin aftur á stað með alvöru tillögu til kynningar. Hitt var meira svona til umræðu og þetta var hugsað sem hugmyndaþing eða íbúaþing þessir fundir í hverfunum, meira heldur en kynning á eitthverju tillögum og heldur áfram núna í vetur. Stefnan var reyndar að koma með drög að tillögu, heildartillögu fyrir áramót, en mér sýnist við náum því ekki.

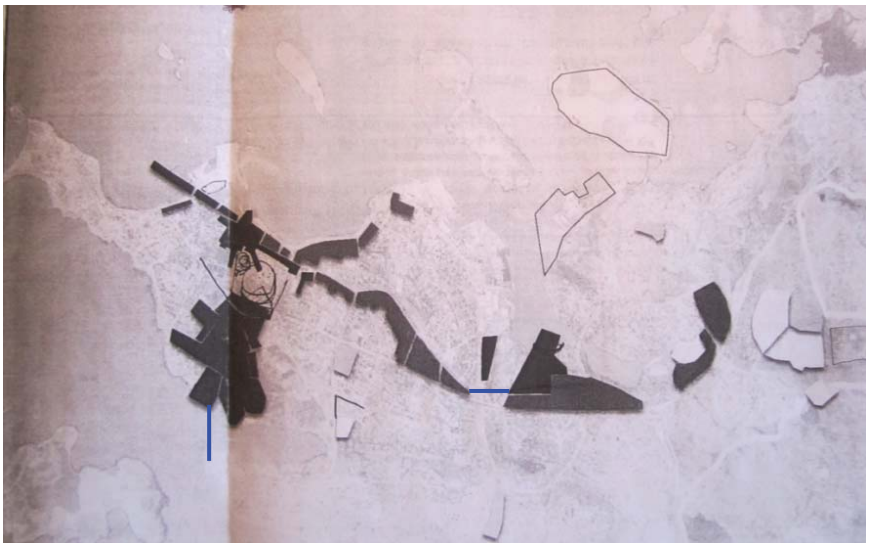


Figure 0-3: Tengingar möguleikar

Arnar: Sorpmál, verða þau ennþá í Álfsnesi?

Haraldur: Já, Sorpa er með samning til 2014 í Álfsnesi, urðunarstaðnum átti að vera lokað fyrir lok 2014, þetta er viðkvæmt mál, þeir finna lyktina i Mosfellsbæ í ákveðnum áttum. Það var farið í að finna nýjan stað, sameiginlegan fyrir öll sveitarfélögin. Niðurstaðan var að Álfsnesið var best út af nálægðinni við, það var vistvænast að hafa þetta nálægast stærsta svæðinu. Mosfellsbær samþykkti aldrei þessa áætlun, síðan þá átti að byggja brennslu stöð og jarðgerðarstöð til að draga úr urðun lífræns úrgangs, en þá voru mjög stór áform. Núna er verið að tala um að byggja litla gasgerðarstöð eða jarðgerðarstöð, móttökustöð fyrir lífrænan úrgang, sem mesta lyktin er að, hún yrði þá keyrð beint inn í hús. þannig að lyktin á að hverfa að mestu og það er líka til að uppfylla markmið í lögum um að draga úr urðun lífræns úrgangs, eða að vinna hann innanhúss. Það verður væntanlega eitthver málamiðlun um að þetta verð áfram vinnsla hér (Álfsnes) og urðun eitthvað lengur en 2014, kannski til 2024. En væntanlega verður textinn í Aðalskipulaginu um að það verði unnið að því að finna framtíðar stað annarsstaðar á skipulagstímanum.

This is a study of the growth and urban development of the northernmost capital of the world, Reykjavik. The research focuses both on the theoretical background of Reykjavik's development as well as the actual physical growth of the city. A prognosis for the city´s future development is held out as well as an analysis of one of the main growth opportunities. A case study will thus be conducted for a relatively large area called Artunshofdi cape. This area shall be re-designed and re-built in the near future and its central location inside the city makes the success of the project vital.

As a young city Reykjavik has gone through majority process where its major actors, the general public, authorities, politicians and investors have had a hard time getting along. In the economic boom following World War II the society has facilitated the usage of the private car to the extent that an effective public transportation is not to be found and the visions of compact city living with its benefits are all but forgotten.

By tracing both the theoretical- and empirical saga of Reykjavik municipality and through analyzing the Artunshofdi cape area the author contributes to the "sustainable urban future of Reykjavik" by unfolding its transportation pattern of automobile dependency and the underlying forces behind the urban development of the city.

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