

JANUARY 2017

BORGARLINA – WORKSHOP AND SEMINAR

PROCESS RECORD



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PROCESS RECORD

PROJEKTNR.

A087187

DOKUMENTNR.

A087187-1

VERSION

2.0

UDGIVELSESDATO

2. January 2017

BESKRIVELSE

PROCESS RECORD

UDARBEJDET

HVPE/MIRI/Lilja

KONTROLLERET

BBJA/HVPE

GODKENDT

MIRI

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1 Background

The interest for improving the public transport in the Capital Area of Reykjavik has increased the last years. The agenda is to work towards a high class public transport system based on developing a solid backbone of public transport in the main corridors – a superior transport product called *Borgarlina*. The concept will be either bus rapid transit (BRT) or a light rail transit (LRT) – in both cases ensuring a high frequent, fast and reliable transport option.

Wednesday 16th November 2016 a seminar regarding high class public transport were held in Reykjavik. The seminar aimed at introducing experiences from Northern Europe and link it to the current situation for Reykjavik and *Borgarlina*.


Thursday-Friday (16-17th November 2016) the seminar was followed up by a workshop-session to discuss high class public transport in Reykjavik by combining local knowledge and expertise from Reykjavik with and experiences from Northern Europe. The session was a combination of presentations and group work to come up with appropriate visions and solutions for the future public transport in Capital Area of Reykjavik.

Both events were hosted at Idno Culture House. The seminar were fully occupied with around 130 attendances during the afternoon and the workshop had the optimal round 40-45 participants accompanied by the 5 hosts and speakers.

2 Seminar

The seminar had three focus areas:

- > Introducing the process towards a high class public transport system.
- > Defining what a high class system is.
- > Exemplifying the urban transformation that needs to be an integrated part of a new system to gain the best effects of the investment.



High classed Public Transport in Reykjavík

Borgarlína – Public Transport Seminar

- 1) Be a part of the planning of the new Borgarlína
- where are we heading?
- 2) A look into the future public transport system
- want to be a part of the transformation of Reykjavík?
- 3) The future public transport system in Reykjavík
- take part in the planning

We are hosting a seminar for high classed public transport in Reykjavík with the focus on the benefits for Reykjavík and the urban transformation.

The seminar will be held at Idno Culture House the 16th November starting at 13:00 and lasting for the next 3 hours

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AGENDA FOR SEMINAR - HIGH CLASSED PUBLIC TRANSPORT IN REYKJAVÍK

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The program

The presentations for the seminar were:

- > Chairman of Mosfellsbær City Council, Bryndís Haraldsdóttir opened the seminar with a welcome and a short presentation of the learnings from the study trip to Copenhagen, Strasbourg and Vancouver.

- > What is a high class public transport system? – experiences from Bergen Bybane by COWI, Bent Bertil Jacobsen.
- > Urban transformation by improved public transport – experiences from Odense by COWI, Michael Goth-Rindal.
- > BRT in Scandinavia (Stavanger, Lund, Malmö, Aalborg, +WAY) by COWI, Henrik Juul Vestergaard.
- > Hafnarfjörður Hraun – Borgarlína by architect and politician Borghildur Sturludóttir.
- > Our Pearlband -Development possibilities along the Borgarlina by Viaplan, Lilja G. Karlsdóttir and by SSH, Hrafnkell Á. Proppé.
- > Summing up and the further process by Dagur B. Eggertsson, Mayor of Reykjavík and chairman for SSH.

The presentations are outlined below:

2.1 What is a high class public transport system?

After a brief welcome, Bent Bertil Jacobsen, light rail expert from COWI, presented COWI's ideas on what a high class public transport system might be and how to get there, supplemented by examples from Bergen, where one of Europe most successful light rail schemes is operated.

Stairs of knowledge

The stairs of knowledge and decisions were introduced to highlight the importance of making decisions at the right level of details at the right steps of the process. To be aware of **when knowledge and decisions** are necessary and **what detail level** of knowledge and decisions are necessary.

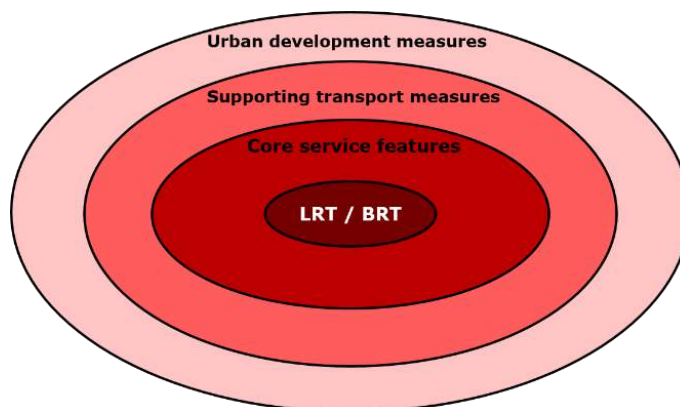
Starting up a planning project requires more overall knowledge about corridor selection, ridership, location of stations, possibilities for urban development and integration. This is to define the project to be agreed on and for taking decisions for moving to the next steps.

The further you are in the process the more knowledge are required as the picture goes **from a more holistic to a more detailed level**. For an EIA-process detailed knowledge of a lot of aspects are necessary, e.g. environmental issues like noise and pollution and nature issues like fauna and animal life. In the tender phase a detailed knowledge of the exact layout and location is required to be as specific as possible to get the most beneficial cost for construction.



High class public transport system

The presentation then sought to define the different aspects of a high class public transport to emphasize all the aspects you have to take into consideration. Roughly speaking these aspects can be sorted in three categories as shown in the figure below. Measures and features of the BRT/LRT system itself (called "core service features") Measures that ensure that the rest of the transport system supports the "BRT/LRT" to make the **system more attractive and competitive** (price and time) towards the car traffic.



The **core service features** is defining characteristics of the BRT/LRT system itself. Among the more important features Bent mentioned;

- > High **frequency**
- > **Direct and fast** (prioritizing the main transport corridors)
- > High **regularity** – no delays in traffic
- > High **comfort**
- > High **quality** stops/terminals

The supporting transport measures is measures affecting the remaining transport system in order to reach the overall goal for the transport system and create **the best conditions** for the BRT/LRT. This could be measures like;

- > **Optimized feeder** bus network
- > High accessibility to stops (**walk/bike, buss**)
- > **Unified** public transport system (tickets, shifts, marketing)

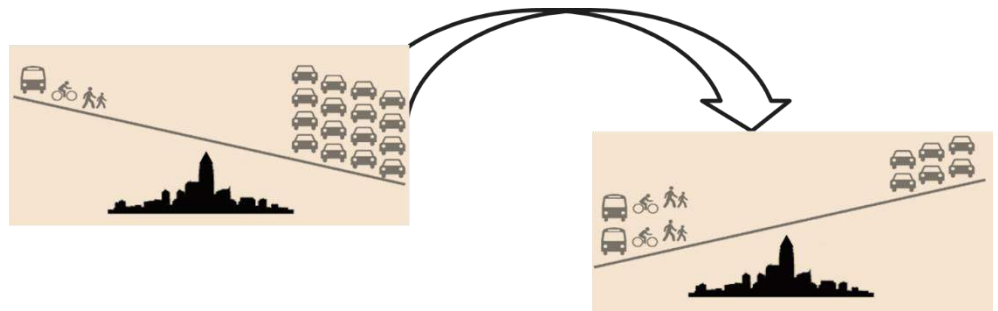
- > **Mobility planning** (involving passengers and companies)
- > **Restrictions** on car traffic (road pricing, parking, accessibility)

The urban development measures is how to plan, develop and integrate the city in a direction where the public transport is supported by the urban development and the public transport is supporting the urban development. This means;

- > Plan for **densification** along the public transport corridor
- > Use the public transport corridor as a **catalyst** for urban development
- > **Meld together** the public transport corridor and the city

Bergen as an example

Bergen were used as a good example of how to plan a high class public transport system that provides the services and measures to make the **system competitive** compared to car, hence increasing the marked share of public transport.



Core service features for Bybanen:



- > **High frequency** - 4 min headway
- > Operating hours app. 5.30-1.00
- > Fairly **high speed** (26-27 km/h)...
- > ...but still focus on **coverage when the need is there** (27 stop along the 20 km line)
- > Own infrastructure and **full priority** in all intersections
- > **High quality** material, stops and concept

Supporting measures for Bybanen:



- > Busses **don't compete** with light rail, but support it:
 - > **Feeds the LRT** – extending coverage
 - > **Relieves LRT** during rush (capacity)
 - > Offer the connections the light rail don't.
 - > Road pricing supports PT in many ways:
 - > Ensures **funding** for developing LRT
 - > **Increases economic incentive** to choose PT instead of car
- Relieves congested roads**, ensuring higher regularity for the busses.

Urban development measures for Bybanen:

- > Focused development around stations:
 - > Increases passenger potential and reduces car dependency
 - > Is requested by the market
 - > New municipal strategy "the walking city" emphasizes:
 - > Walk/bike accessibility especially relating to PT-stops
 - > Densification around stops
 - > Prioritized order: walk, bike, PT, goods, car

New urban development area along the LRT corridor – Mindemyren has a potential for up to 25.000 inhabitants and employees with a planned car share at only 10 %. The area is fully covered by two LRT lines and supplemented by bus services. Furthermore walking and cycling are important for the area. Thereby Mindemyren creates an environment and the facilities to become a sustainable urban development.

Bergen has successes in reducing the car share of the total traffic in favor for the public transport. During 5 years (2008→2013) the car share in the city parts served by the light rail has gone from 54 % to 46 % while the share of public transport has increased from 20 % to 28 %.

2.2 Urban transformation by improved public transport

Public transport expert, Michael Goth-Rindal from COWI, held a presentation about the synergies between urban transformation and improved public transport. The main concept being that the high class public transport supports the urban development and increases market value, while the urban development leads to higher ridership and ticket revenue in the high class public transport.

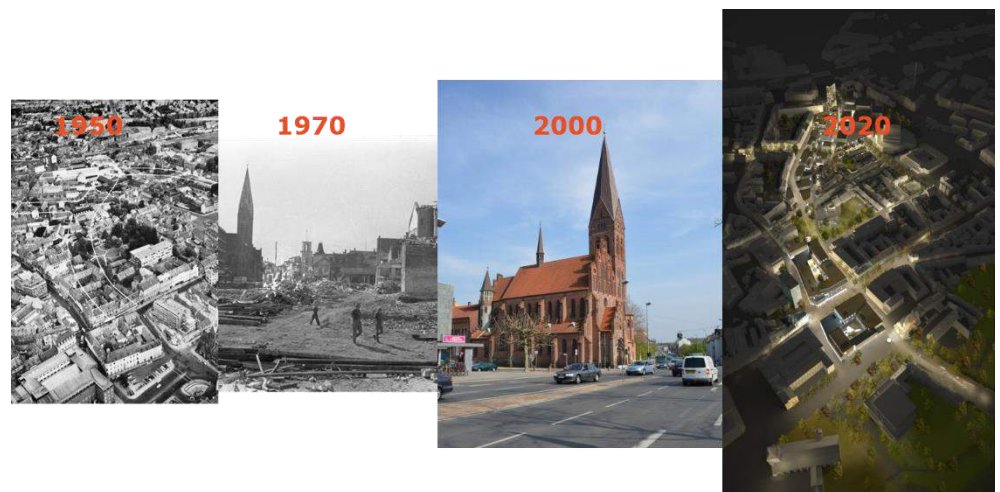
Odense

Odense (200.000 inhb.) is in the process of building light rail and was highlighted as a good example of these effects.

In the 1960's Odense was transformed into a city for cars by constructing of a huge road network. Existing buildings in the city center were demolished to carve the way for a 4-lane road that splits the city center into two. Accessibility by car was increased, resulting in urban sprawl and increased car dependency.

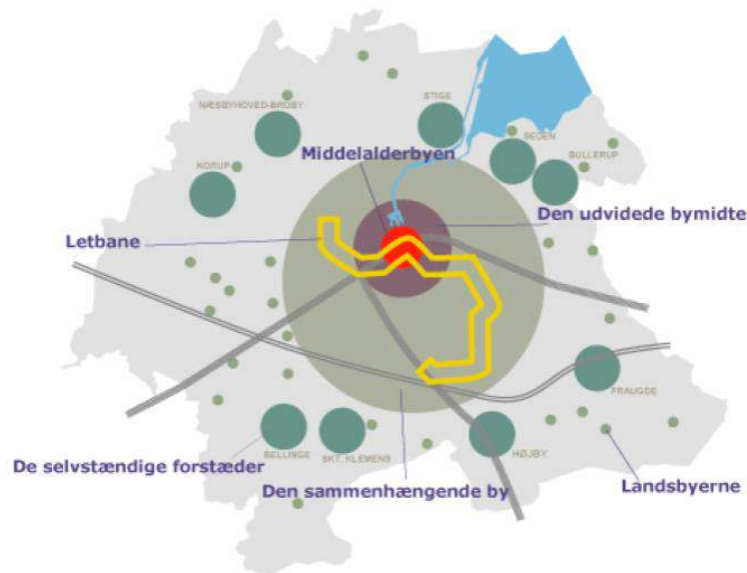
In 2008 Odense decided to radically change the course by closing the 4-lane road in the city center to transform Odense into a lively and vibrant urban area for pedestrians and bikes. This meant creating an urban space and densify the city. In the summer of 2014 the road was closed to through traffic and construction in the project area began.

In 2020 the idea is that Odense is transformed into a city for sustainable transport where the new light rail connects the (prioritized) urban development areas with the city center. The vision is: "*Fra en stor dansk by til en dansk storby*".



The way to transform Odense into a city for sustainable transport is based on a new plan strategy where the light rail is the backbone in the urban development. The municipality plan for Odense towards 2028 has clear principles for the urban development in the 12-year plan 2016-2028 – an "inside-out" urban development:

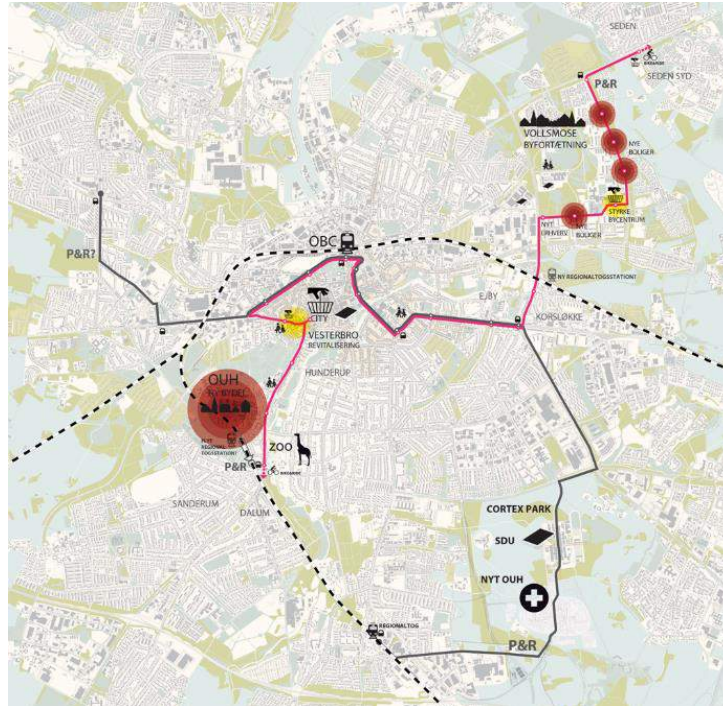
- > prioritizes densification and change of land use (from industry to housing and offices) in Odense city center
- > the areas around new light rail stations will be prioritized as well for urban development
- > new areas for urban development will not be located in the suburbs



Investments has already started and focuses at areas in the coming light rail corridor and in the city center. And the next 5 years a lot of urban development is planned and started up construction around the light rail corridor and in the city center. Investments sum up to:

- > the light rail is estimated to 3.6 bill. DKK
- > a total investment in urban development of around 34 bill. DKK.
- > 1/3 of the investments are private investors
- > Odense invests in total 5.3 bill. DKK (including part of the light rail)

The second light rail line is planned to connect new areas to the LRT system and the Campus area.



The second line will:

- > serve an large area that will be abandoned (old hospital area)
- > create a corridor for separated public transport (LRT and buses)
- > boosting the urban life in the dead-end of the shopping street
- > the backbone in transforming a socially deprived area in Odense
- > and even more investments will follow

Bergen

In Bergen Bybanen is a success resulting in, increased ridership, expansions of the network, longer trams and higher frequency. Part of the reason for this is urban development is prioritized around Bybanens stops.

Bybanen is thereby a working as a strong strategic tool for the urban development. The growth is clearly prioritized close to the light rail stations and even more interesting the marked as well is focused at the areas close to the light rail stations – both housing and commercial properties. This indicates that the proximity to a station is very important for the attractiveness of a property.



Reviews from 2014 showed investments along the first stage of around 14 bill. NOK in urban development (around 500,000 m²), while the costs for LRT in the corridor were around 2.2 bill. NOK. The full potential for investments in the LRT corridor is even higher.

These perspectives and facts about urban development underlines that the light rail is not an isolated transportation project, but greatly affects the environment and helps to lift the surrounding city and attract investment to the areas close to stations.

The Danish Business Authority



The Danish Business Authority (Erhvervsstyrelsen) carried out a study of "gains for investment in urban life and urban quality" to find key figures for how housing prices and rent levels in commercial leases reflects qualities in cities. They focused at setting up rules of thumbs for housing prices and commercial rent value:

The analyses shows a range of factors with positive impact on own housing prices - such as parks and green areas in the surroundings, proximity to the coast, proximity to metro stations, etc. Value of housing (self-owned) near stations increases 5-7 % closest to a station and then decreasing to 0 % 200-300m away

Regarding commercial rent the analyses shows that infrastructure and accessibility are crucial for businesses. Location in relation to public transport is particularly important - here spreading the effect in the large distance from the station. Value of commercial rent near stations increases 30-40 % closest to a station and then decreasing to 0 % 1.5 km away.

2.3 BRT in Scandinavia

In this presentation, public transport expert Henrik Juul Vestergaard (COWI) gave a brief introduction to various examples of BRT-like systems in Scandinavia and highlighted the main learning points of value to the decision making process in Reykjavik.

Five BRT concepts were presented, including Lund, Malmö, Stavanger, +WAY on Zealand and Aalborg

Lundalänken in Lund

Lund introduced a 6 km BRT line – Lundalänken - as the backbone of their mobility campaign. The idea was formed during last part of the 1980's and the line was opened in 2003. The infrastructure is served by a range of different busses comprising more than 20 departures pr. hour and direction during rush.



Part of complete mobility package

The BRT line proved to be a success and has helped keeping the car share of trips in Lund low. An important part of the success was that the BRT line on is one part of the complete mobility plan for the city, emphasizing biking, walking as well as many other means utilized in order to reach the goal of low car share.

Another important part of the success is that Lund is monitoring the development of a range of transport indicators and hence evaluating the effect of the system each year. That has helped to keep focus on the subject throughout time, keeping transport high on the political agenda. Changing transport behavior is not easy nor a hit-and-run task, but must be pursued steadily.

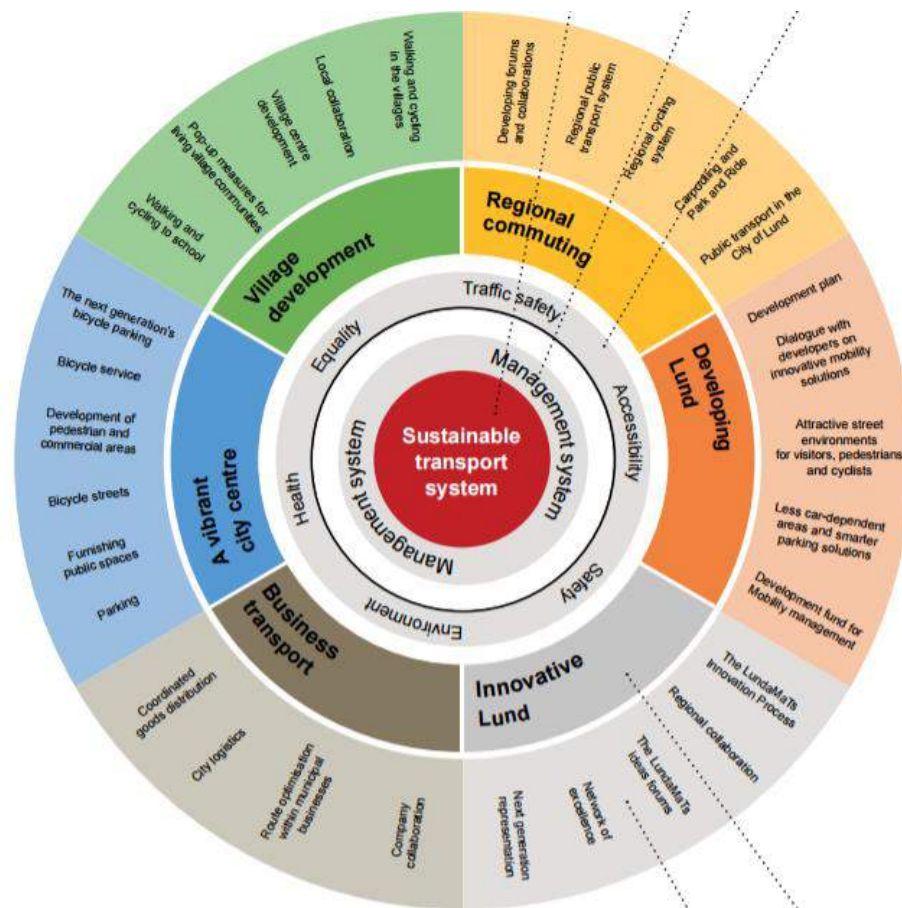


Figure 1 Wheel of measures from the mobility plan for Lund (Lundamats).

Stepping stone to-
wards light rail

Lundalänken has in the entire process been seen as a stepping stone towards a light rail system. That means that tough and expensive, but also very efficient investments had to be made in order to prepare for a light rail system. For instance the line passes through the hospital area, a stage that was hard and expensive to build, but also gave the best possible conditions for the BRT as well as preparing the system for light rail.

Decisions has now been made to build a light rail system in the corridor – expected opening is 2019.

Malmö-expressen in Malmö

BRT where the need
is biggest

In 2014 Malmö opened the 8.5 km BRT line – Malmö-expressen. Based on the former most frequent citybus line, Malmö-expressen covers some of the densest urban areas with 5 min. headway.

Picking the low
hanging fruits

60 % of the line runs in separate lanes, meaning that the bus is still delayed in traffic on some sections. The focus of the project has been on harvesting the low hanging fruits rather than spending all the effort on creating a full scale separate BRT in the first place. Separate lane and priority has been given where it was possible, while measures like quick boarding (self-ticketing) and high quality material also were prioritized.

This meant that the infrastructure has been established for the relatively low cost of 10-20 mill. \$. The result was a radical increase in both patronage (+30 %) and regularity (from 60 % to 90 % regularity) in the first year.

Making the bus an urban icon

One of the most significant elements of the system is the busses. With the 24 m hybrid busses with a design that reassembles light rail, Malmö-expressen is clearly visible in the cityscape as an icon, and hence works as a commercial for public transport in itself.



Bussveien in the Stavanger region

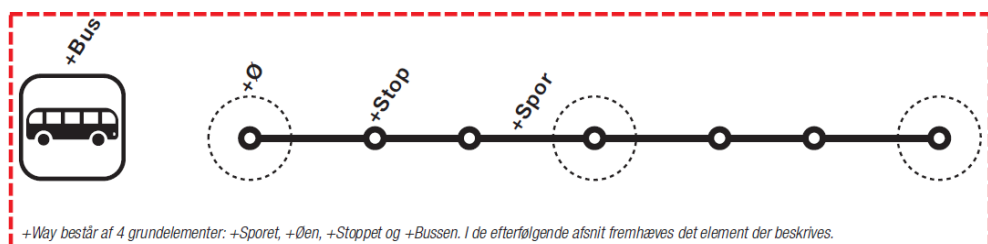
A few year ago the Stavanger region abandoned plans for a light rail system and instead decided to develop a BRT network as the backbone for their public transport system. This resulted in plans for the largest BRT network in Europe comprising around 50 km of BRT-lines – 90 % in separate lanes.

The project has an estimated total cost of app. 1 bill. \$ and has a planned opening in 2023. However - the first 6 km has already been opened showing significant effects on regularity and travel time.



+WAY in Greater Copenhagen

In Greater Copenhagen, the public transport authority – Movia – has been seeking for a BRT system that provides efficient public transport in the central city areas, but at the same time helps developing a livable and attractive city.



The conclusion to this was +WAY – a concept that focusses on how the BRT-line can lift the urban areas it passes through.

Refitting BRT to the urban structure

The concept defines 4 steps that should be addressed planning a +WAY. The bus (design, interior, layout), the track (priority, separated lanes) and then two levels of stops. The +Stop, where focus is on quick and easy boarding for a simple stop designed a "less is more" or the +Ø (+Isle) – the central stops were the BRT and the city meets and melds together into urban squares.

This is a way to try meeting the citizens and their dreams for a better city and not only wishes for efficient transport.

The first full scale +WAY has now been built over a few km in Copenhagen. Experience show great effect on regularity and driving time, but also shows that much is lost again when the busses merge together with the cars at the end of the BRT. A learning point here might be to invest improving the system over longer distances in order to get notable effects.

Plusbus in Aalborg

Like on Zealand, Aalborg is planning for at PlusBus concept – here as a result of abandoning light rail plans due to finance issues.

As in Movias +WAY concept, Aalborg also puts much effort into lifting the urban areas, the BRT passes through on its 11 km journey through the densest parts of the city.

The project is at an early planning stage right now, but shows great potential to lift public transport in Aalborg.



3 Workshop

The workshop were all day arrangements both Thursday and Friday 8.30-16.

The programme The first day of the workshop started with welcome and presentation by Hjálmar Sveinsson chairman of the Regional Plan committee.

Thursday were divided into two subjects;

- > Vision and service level
 - > Purpose for the day and workshop
 - > Level of necessary knowledge
 - > Introduction to existing vision for the Cityline - Borgarlina
 - > Examples on visions for public transport
 - > Which public share are we aiming for (12%)? – Higher share for the Cityline and lower share elsewhere (with lower service)
 - > Vision for public transport – work in groups
 - > Planning guidelines and service goals
 - > The rest of the public transport system (underlying bus net), what is the difference modal split in between the various public bus concepts
 - > Service levels for public transport – work in groups
- > Urban planning
 - > Sustainable cities or neighborhoods e.g. Freiburg Vauban, Vancouver Cambi Corridor, Bergen Mindemyren
 - > Revision of building development in the Capital Area
 - > Urban transformation of Capital Area of Reykjavik – work in groups
 - > Summary of the day and the further process

High classed Public Transport in Reykjavik

Workshop - day 1: vision for the public transport

- > 8:30: Registration og morning coffee
- > 9:00-12:00: Workshop: **Vision and service level**
 - > Purpose for the day and workshop – chairman of the Regional Plan committee, Hjálmar Sveinsson
 - > Level of necessary knowledge – COWI, Bent Bertil Jacobsen
 - > Introduction to existing vision for the Cityline – Borgarlina – SSH, Hrafnkell Á. Proppe
 - > Examples on visions for public transport – COWI, Michael Goth-Rindal
 - > Which public share are we aiming for (12%)? – Higher share for the Cityline and lower share elsewhere (with lower service) – COWI, Michael Goth-Rindal
 - > **Vision for public transport – work in groups ending with coffee break (45 min.)**
 - > Planning guidelines and service goals – COWI, Henrik Juul Vestergaard
 - > The rest of the public transport system (underlying bus net), what is the difference modal split in between the various public bus concepts – COWI, Henrik Juul Vestergaard
 - > **Service levels for public transport – work in groups (30 min.)**
- > 12:00-13:00: Lunch
- > 13:00-15:00: Workshop: **Urban planning**
 - > Sustainable cities or neighborhoods e.g. Freiburg Vauban, Vancouver Cambi Corridor, Bergen Mindemyren) – COWI, Bent Bertil Jacobsen and Viaplan, Lilja Gudridur Karlsdottir
 - > Revision of building development in the Capital Area - VSÖ, Grétar Már Hreggviðsson
 - > Coffee break
 - > **Transformation of Reykjavik (change of use and densification/ social boost, beautification) – work in groups (45 min.)**
 - > Summary of the day and the further process – SSH, Hrafnkell Á. Proppe and Lilja G. Karlsdottir

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Friday were also divided into two subjects;

- > Planning of public transport
 - > Summary of the vision, planning guidelines and service goals
 - > What is the traffic problems today? (first in groups – then in plenum)
 - > Short introduction to existing corridor studies
 - > High class corridors - work in groups
- > Make public transport more attractive
 - > Summary from group work
 - > Other measures that support public transport (P & R, bike, tolls, parking strategy, restrictive urban development, price)
 - > Measures that will work in Capital Area of Reykjavik - work in groups
 - > Summary of the day and the further process

High classed Public Transport in Reykjavik

Workshop - day 2: *planner for a day*

- > 8:30: Registration og morning coffee
- > 9:00-12:15: Workshop: **Planning of public transport**
 - > Summary of the vision, planning guidelines and service goals – COWI
 - > **What is the traffic problems today? (first in groups – then in plenum) (30 min.)**
 - > Short introduction to existing corridor studies – Mannvit, Ólög Kristjánsdóttir
 - > Coffee break (15 min.)
 - > **High classed corridors – work in groups (90 min.)**
 - > Small tasks given during the session
- > 12:15-13:15: Lunch
- > 13:15-15:00: Workshop: **Make public transport more attractive**
 - > Summary from group work (20 min.)
 - > Other measures that support public transport (P & R, bike, tolls, parking strategy, restrictive urban development, price) – COWI, Michael Goth-Rindal
 - > **Measures that will work in Reykjavik – work in groups (20 min.)**
 - > Summary of the day and the further process COWI, Hjálmar Sveinsson and Borghildur Sturludóttir
- > 15:00-16:00: Friday reward beer – thanks for taking your time

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The presentations and work in groups are outlined below:

3.1 Day 1 - vision and service level

Level of necessary knowledge

This was more or less the presentation from the seminar about the **stairs of knowledge and decisions** and the setting the frame for the work towards a future high class system in Capital Area of Reykjavik.

Clarifying the message of **when knowledge and decisions** are necessary and **what detail level** of knowledge and decisions are necessary.

Introduction to existing vision for the Cityline – Borgarlina

Brief introduction to the Regional Plan for the Greater Reykjavik Area and the journey from the start of the work in 2011 until the acceptance of the plan in 2015.

A little historical insight on how the area has developed as a car dominant place in the last 40 years or so and the consequences to land use development and pollution.

Examples on visions for public transport

Looking in Scandinavia at the national visions for public transport it seems like the visions are aiming at reaching the same goal. But the way to get to the goal differs.

In **Denmark** the vision is set in the "*Green Transport Policy*":

- > the public transport shall handle (most) of the future growth in traffic volume
- > reduce the overall CO₂-emissions from transportation

In **Norway** the vision is set in the "*National Transport Plan*":

- > the level of car traffic cannot exceed the current level
- > all growth in traffic in urban areas shall be handled by public transport, bicycle and walk
- > strengthen the sustainable transport at behalf of the car traffic
- > this is defined "*zero-growth-target*" (0-vekstmålet) and is based on an agreement between public authorities defining strategies for how to meet the vision
- > the government has earmarked funding for rewarding actions that seeks to meet the goals in the "*zero-growth-target*"

A regional vision for the **Öresund-region** is "One city" by:

- > in 2025, Copenhagen and Malmö a **coherent metropolis** where growth and quality of life go hand in hand
- > the first "border-region" in Europe to be **CO₂-neutral**
- > a joint and **integrated marked** for housing, labor and education
- > **improved transportation** (external and internal)
- > **high frequent** and **fast metro** connection between Malmö and Copenhagen
 - > create a faster connection between city centers

- > solve capacity problems across Öresund-bridge for high speed trains, regional trains and freight trains



The regional transport infrastructure plan for Skåne is based on the national transport plan defining the visions, strategies and goals for the transport in Skåne. The **Skåne region and Malmö** aims at:

- > to double the number of trips with public transport towards 2020
- > a marked share in 2030 at 40 % of all transport (+100 %)
- > investing in high class public transport (rail, LRT, BRT and buses)

Copenhagen has in their municipality plan "*Kommuneplan 2011 and Grøn mobilitet*" set a vision aiming at:

- > 20 % more passengers in 2025
- > at least 2/3 of the growth in trips towards 2025 should be sustainable transport (public transport, bike and walk)
 - > at least 1/3 of all trips are bike (Vision: the world's best city for bikes)
 - > at least 1/3 of all trips are public transport
 - > maximum 1/3 of all trips are car
- > travel time for buses are reduced by 10 % in 2025
- > CO₂-neutral in 2025

The vision can't be fulfilled only by investments in further public transport. But in Copenhagen we find a principle for densification around stations (*stationsnærhedsprincippet*)

- > citizens living near stations tend to reduce travel by car with 25 %
- > only half of the employees use car if working near a station
- > (+ increased real estate value near stations).

Odense has in their municipality plan "*Kommuneplan 2016-2028*" set a vision aiming at:

- > changed transport behavior must be supported so that more in the future will choose to cycle, walk or use public transport
- > car traffic may not exceed 2014-level. This means that the growth in traffic due to more people should be handled by growth in walking, cycling and public transport.
- > this means that the car share of the total number of trips will fall until 2028

- > CO₂-emissions, noise and air pollution from traffic is to be reduced
- > light rail are under construction and future lines are planned
- > increased number of stations (option for densification near stations)

The strategy for public transport in Odense 2015-2020 aims at:

- > annual increase at 3% in passengers for public transport till 2020
- > 58 % more passengers in 2024 compared to 2012

Hordaland (region of Bergen) has a regional transport plan for Hordaland 2013-2024. The vision aims at:

- > reducing the share of car traffic from 64 % to 45 % (in 2024)
- > increasing public transport from 12 % to 16 %
- > one consequence of this measure is that of public transport competitiveness must be strengthened so that it becomes attractive to use public

The regional area- and transport plan for the region of Bergen aims at:

- > plan and guideline for land use and urban development based on densification instead of urban sprawl that strengthens the competition for public transport, bicycle and walking on behalf of car traffic.

The public transport strategy for Hordaland towards 2030 aims at:

- > planning the public transport to be attractive and able to meet the "zero-growth-target"

Bergen has a vision for in the public transport "*Visjon for kollektivtilbudet i Bergen i 2020*" aiming at:

- > aims for 50% increase of all public transport trips
- > is an eco-friendly and efficient public transport system that is easy to use for all user groups
- > ensures the customer a quick, predictable and comfortable travel to all major destination point
- > by full pass ability to all of public transport main routes.

Investments in more and better public transport (light rail and bus) is part of the realization of the vision by:

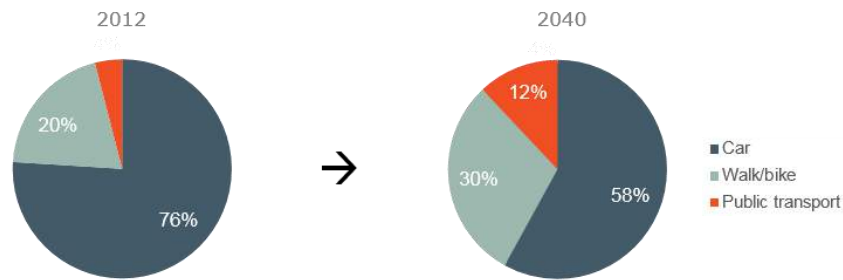
- > prioritize the resources where most passengers travels
- > prioritize a simple and efficient bus network with fast travel times and high frequency

Bergen has restrictions for car traffic - both tolls and a parking strategy to fulfill the vision.

Which public share are we aiming for (12%)?

– *Higher share for the Cityline and lower share elsewhere (with lower service)*

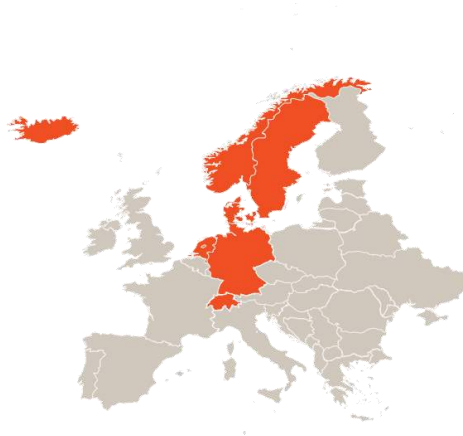
The vision for the public transport in Capital Area of Reykjavik is aiming at tripling the public share from today's 4 % to 12 % public transport trips in 2040.



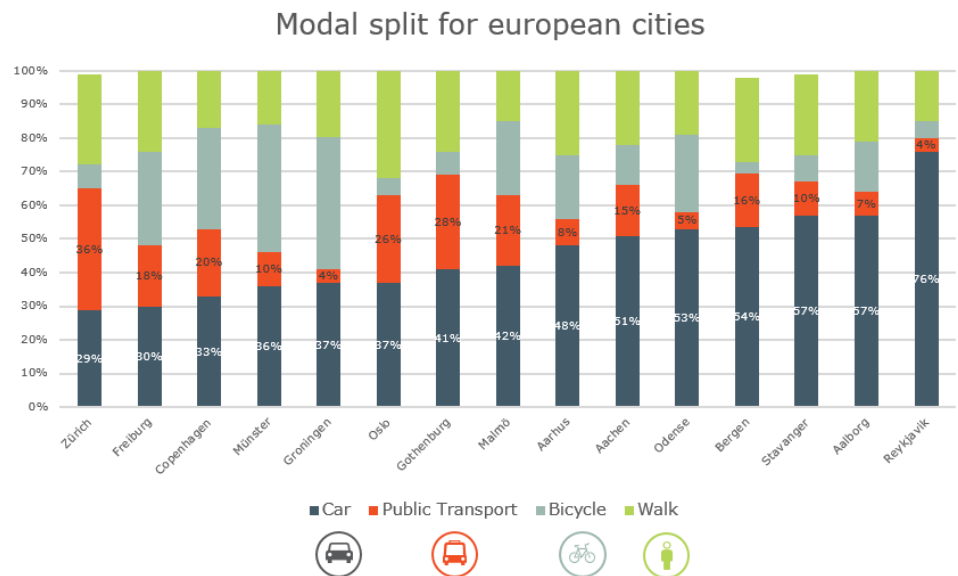
The number of citizens in Capital Area of Reykjavik is today around 215,000 and the population is expected to reach around 275,000 in 2040 equals to an increase at around 28%. This means that the vision will increase the number of public trips by around 3-4 times.

	Today	2040	Change
Citizens	215.000	275.000	+28 %
Public share	4 %	12 %	Triple
Public number	8.600	33.000	+284 %

What are other European cities aiming for?



We searched for the modal split for other comparable European cities (size and/or culture) to see what is possible and where these cities are.



As seen on this graph Capital Area of Reykjavik is far behind when looking at the sustainable transport with less than 25 % walk, bike and public transport. 76 % is car traffic today and only 4 % is public transport.

Up to 70 % sustainable transport can be found around Europe but looking at the Scandinavian cities at similar size the 40-50 % sustainable transport is found (Bergen, Stavanger, Aalborg and Odense). The vision for 2040 will bring Capital Area of Reykjavik closer to these Scandinavian cities with around 40 % sustainable transport.

How to increase the use of public transport?

The public transport share tends to be even higher where the public transport concept is high class and the right conditions are in place. This means:

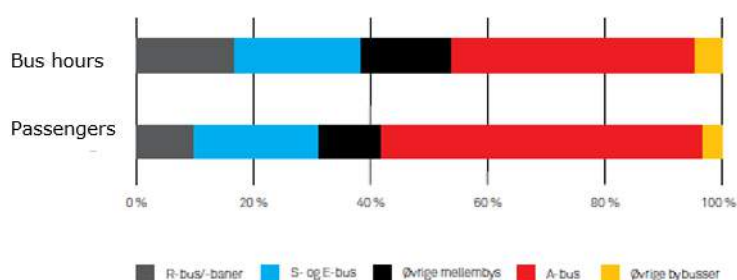
- > High frequency
- > Low and reliable travel times
- > High comfort and quality
- > High accessibility for bike/walk and supporting bus network
- > Dense urban surroundings
- > Restrictions on car traffic (road pricing, parking strategy, priority for public transport)

Separate lanes for the high class public transport concept removes congestion issues and improves travel times, reliability and comfort. This will be the passengers' experience as a clear improvement.

Experience shows that a high class public transport system with higher speeds and more comfortable ride than conventional bus services attract more passengers to public transport. The urban development and densification of both houses and jobs in areas around the corridor will increase the passenger base for LRT/BRT and thus further strengthen the basis for its establishment. Here are some examples:

- > Bybanen in Bergen has increased the public share in the light rail corridor from 20% to 28 %
- > The light rail around Copenhagen (Ring 3) is expected to have 43,000 passengers compared to 20,000 passengers today (buses on same route)

Copenhagen has focused on improving the bus service on the high class concepts (A-bus and S-bus that focuses on direct and fast trips where the demand is high). The figure shows that the A-bus network has much more passengers than the efforts put into operation compared to other bus concepts. This is an example of that a high class public transport system tends to attract more passengers (on behalf of other transport modes).



A-bus experience shows that 1 out of 3 passengers has increased the number of bus trips with A-bus concepts compared to before the introduction.

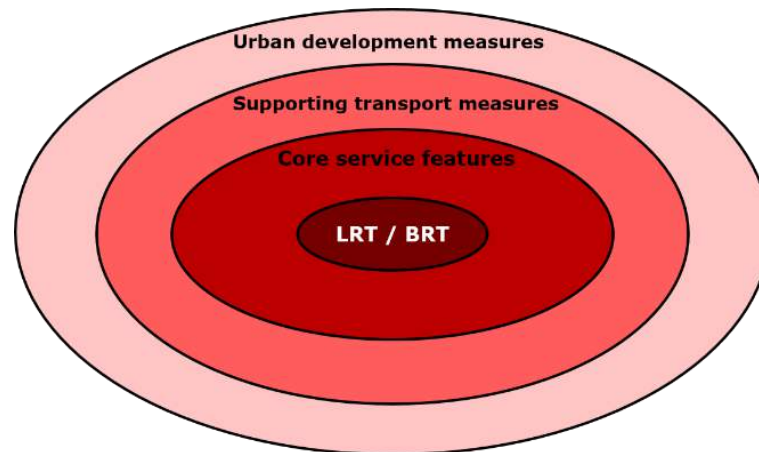
The same picture is seen at Zealand (including Copenhagen) that has several high class concepts and 20 % of all 500 lines are classified high class concepts.

- > Here do 3/4 of the passengers travel (and 57 % of the resources are spend here).

The share for the Cityline (Borgarlina) and other high class bus concepts in Capital Area of Reykjavik will be higher than the share for the rest of the more conventional bus service. Thereby the public share for the Cityline should aim at being much higher than the 12 % in 2040. The better the conditions are for the Cityline and other high class bus concepts - the more passengers will be attracted.

Planning guidelines and service goals

The different aspects of planning guide lines and service vision was presented as an inspiration for the group work on service vision and planning guidelines, using the following figure to sort the different measures.



Core service features

- › High frequency (prioritising the main transport corridors)
- › Direct and fast (Uninterrupted travel between the stops)
- › High regularity and reliability – no delays in traffic
- › High comfort and quality busses
- › High quality stops/terminals

Supporting transport measures

- › Optimised **feeder busnetwork**
- › **Unified** public transport system (tickets, shifts, marketing)
- › High accessibility to stops (**walk/bike, buss**)
- › **Park and ride** / kiss and ride
- › **Mobility planning** (involving passengers and companies)
-
- › **Restrictions** on car traffic (road pricing, parking)

Urban development measures

- › Plan for densification along the PT corridor
- › Use the PT corridor as a catalyst for urban development
- › Meld together the PT corridor and the city

Each of the shown features and measures of the above figure was illustrated and exemplified during the presentation "Planning guidelines and service goals".

3.2 Day 1 – urban planning

Sustainable cities or neighborhoods

A presentation of how cities or neighborhoods in cities are planned to be sustainable cities depending on sustainable transport instead of car traffic.

Freiburg - Vauban

Freiburg is an example of a city working for sustainable cities and transport. In 2006 Freiburg was awarded a OSMOSE gold star for its long term approach towards a sustainable mobility.

The share of car traffic has decreased from 39 % in 1982 to 32 % in 1999 and the vision is to reach the goal of 20 % car traffic in 2020. In the same period the share of public transport has nearly doubled.

Modal Split in Freiburg



From 2004 to 2012 the number of passengers has increased by 13 % which means heading towards the vision for 2020. Freiburg keeps investing in facilities for sustainable transport on the behalf of car traffic. The bicycle network is increasing and prioritized by the means of "right-of-way", a "Cycle-Priority-Network", "bike stations" and "Express Highway for cyclists".

Vauban - arrangement of streets



Vauban - zones without parking space



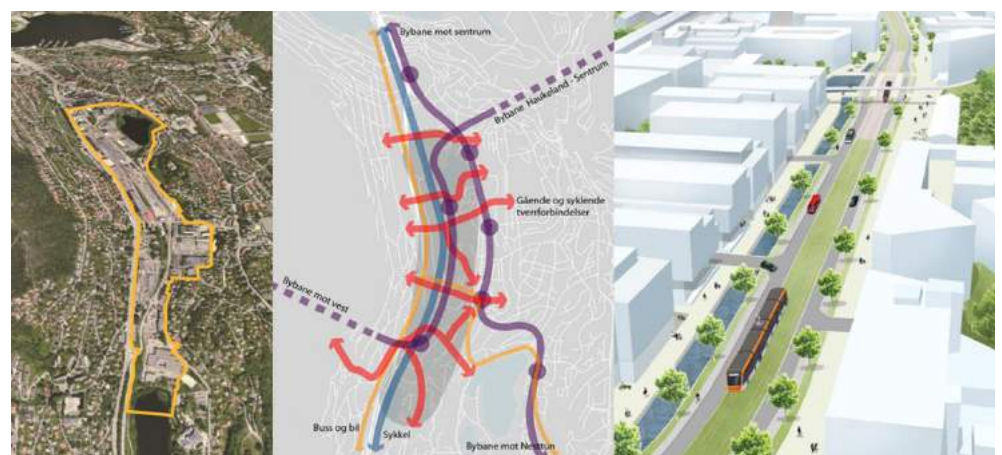
Vauban is a newer urban developed area in Freiburg that has been planned to support sustainable transport by integrating a new light rail and good accessibility for walking and cycling. There is also a lot of restrictions for car traffic by no parking space in the central part of the area and a road network that gives detours and is time consuming.

Vauban is planned to have a much lower density of private cars compared to Freiburg. In Freiburg there are around 35 car per 100 inhabitants. In Vauban it's planned to have around 16 car per 100 inhabitants.

Bergen - Mindemyren

Mindemyren is located south of Bergen city center and is an old industrial area that is abandoned. The area is located along the Bybanen corridor and a second line is planned in the area.

Mindemyren has a potential for **up to 25.000** inhabitants and employees with a planned **car share at only 10 %**.



Vancouver - Cambi Corridor

The Cambie Corridor is located in central south Vancouver and is a good example of Transit oriented development, where The Canada line opened in 2009. The

introduction of the Canada Line made it possible to build dense mixed use areas. Phase 1 of the Corridor planning made it possible to redevelop key sites near the stations (2010), phase 2 identified specific land use changes and policies for “core area” properties fronting Cambie Street and adjacent arterials (2011). Phase 3 is the newest addition where the surrounding neighbourhood is being altered as transit-influenced focus area



Figure: Artist illustration of Oakridge Town Centre. (Cambi Corridor Plan)

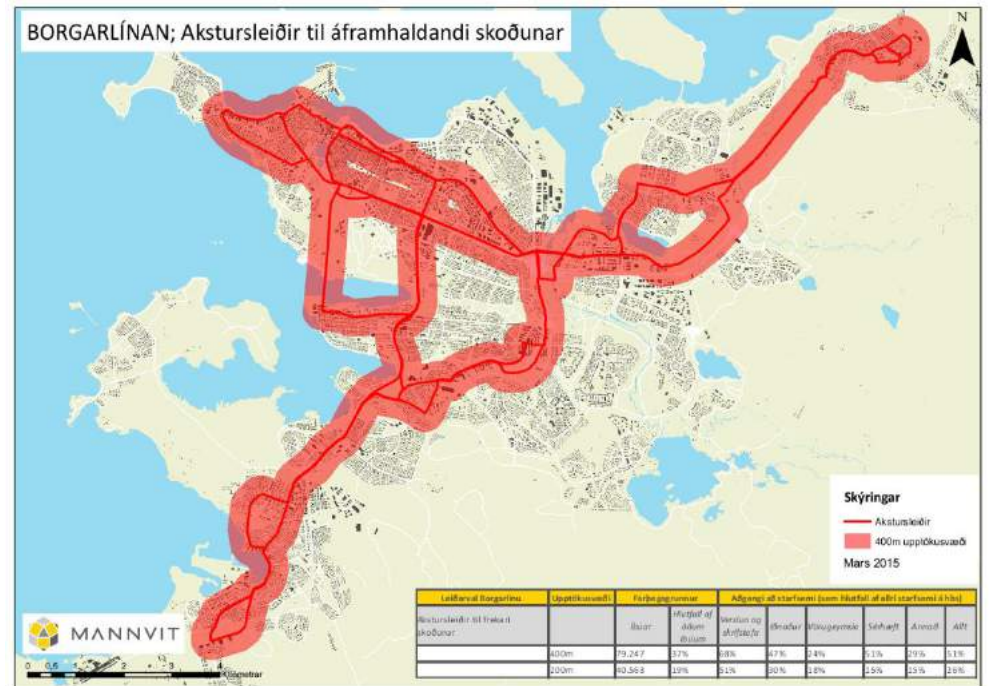
Examples for higher densification

The Consultancy firm VSO (Grétar Már Hreggviðsson) presented examples of already planned changes in land-use in the Reykjavik Area since the acceptance of the Regional Plan.

3.3 Day 2 – planning the system

Short introduction to existing corridor studies

The Consultancy firm Mannvit (Ólög Kristjánsdóttir) presented studies done for the possible lines for Borgarlina. The study was done in 2015 and was based merely on connecting centers as well as analyzing where there was possible space for a LRT/BRT system.



Furthermore Ólöf Kristjánsdóttir presented work on more detailed ideas about the layout of Borgarlína in the eastern part of Reykjavík.

3.4 Day 2 - make public transport more attractive

Other measures that support public transport

A throughout of the **restrictive supporting measures** that are necessary for a successful high class public transport system. These measures could help fulfilling the vision for the public transport towards 2040.

The measures focus primary at restrictions on car traffic;

- > tolls or road pricing
- > travel speed and priority in favor for sustainable transport modes
- > parking strategy (space, price and location)
- > urban development (restrictive)

Road pricing

Toll or road pricing is charging the cars for entering or driving in the urban area. This has several purposes;

- > making public transport cheaper than car traffic (price does matter)
- > funding improved sustainable transport from the revenue
- > an environmental purpose

Toll or road pricing is a more and more used element in Europe

- > Norwegian cities use tolls for financing infrastructure and public transport
- > London – congestion charge (8£)
- > Sweden has several city toll rings to reduce congestion
- > German cities use tolls to only allow ecofriendly cars in city centers

- > Italian cities use tolls to avoid car traffic in city centers and reduce emissions

In Bergen the price for passing a toll has recently increased from 25 NOK to 45 NOK for a car in rush hour. Outside rush hours the price has decreased to 19 NOK. The price differentiation aims to reduce the car traffic in periods with high traffic volume and congestion (less emissions, better air quality and better passability for buses). The higher rush hour price has reduced the car traffic with 20,000 cars every morning **equal to a 14 % reduction**.

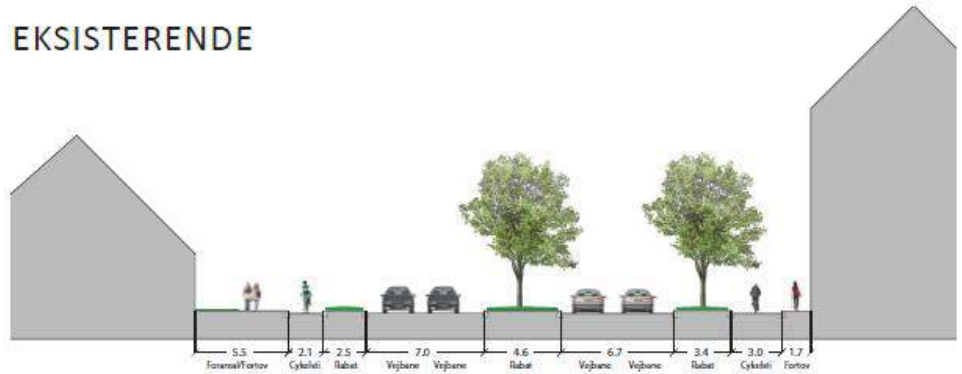
Car restrictions and speed reduction

The travel speed for car traffic along the high class corridors could be reduced by:

- > transforming existing car lanes into separated public transport lanes (less space for car traffic)
- > prioritizing public transport in signals to keep travel speed for public transport high (on behalf of car traffic)
- > prioritizing bike traffic in signals together with public transport (sustainable transport modes on behalf of car traffic)
- > both for crossing and parallel running car traffic –prioritize the public transport
- > if not separated lanes for public transport – then prioritize the public transport at bus stops to get the bus in front of the traffic instead of waiting for the cars to pass

In Odense it's planned to decrease the number of lanes at one of the arterial roads from 4 to 2 car lanes and create 2 lanes for only buses and light rail. The consequence is that the traffic will be slower and the public transport will have lower travel time in this corridor.

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Parking strategies is a central element in making the public transport more attractive. The parking strategy should at least handle the two most important elements;

- > time spend for parking
- > price for parking

These two elements is only relevant for car traffic and thereby is not a part of sustainable transport. This enables the public transport to get comparative advantages in terms of price and time:

- > increased pricing for parking makes public transport relatively cheaper
- > increased time spend for parking makes public transport relatively faster
- > if both elements are increased or high – the public transport becomes even more attractive

P&R is a combination of car traffic and public transport – aiming for car use outside the city and use of public transport inside the city:

- > reducing congestion inside the city (advantage for the public transport and environment)
- > creating good accessibility to the high class public transport system (where the public transport is let frequent)
- > easy entrance to the public transport (high standard stop and real information about the next departure)
- > even combined with other functions (shopping, grocery, haircut, laundry, child care, café)

- > one ticket for parking and public transport (maybe cheaper than parking in the city center)

Bike & Ride is also an important measure to keep in mind – then you don't let the people into the car but keep them in the sustainable transport system

Restrictive urban development:

- > Use restrictive parking norms when building close to high class public transport corridors to reduce car ownership in these areas
- > High pricing for parking (Ørestad in Copenhagen – 950 DKK pr. month and Nordhavn – 1,120 DKK pr. month for residents and 1,800 DKK for employees)
- > Make complicated road networks to and from new building close to high class public transport corridors (bottleneck or long way to main road network)
- > Mixed use close to high class public transport corridors can help reduce the need for a car

Sustainable urban development:

- > Create good accessibility to and from the public transport and best of all – integrate the public transport in the urban development
- > Give the urban development an identity of being a part of the public transport system
- > Build smart and attractive bike facilities both at origin/destination and public transport stop and in-between

3.5 Work in groups

The participants in the workshop were divided into 6 groups with no one from the same company or organization in the same group. Thereby the groups were geographically spread and different interests should be represented in each group.

3.5.1 Day 1

Vision for public transport

Work questions:

- > *How should the vision be for improving the public transport in Capital Area of Reykjavik?*
- > *How should the vision be for the urban development around the high class public transport?*

These questions gave some good and sound discussions in the groups and a lot of ideas, concepts and new questions arises:

Is 12 % enough?	Could BRT/LRT be a platform for innovative thinking?	Who should we compare with? EU or US?
Densifying is good, but how do we get all municipalities to agree on the goal?		Should the goal aim for the entire green transport share instead?
Are high fares part of the problem?	Do motorists enjoy coffee enough to skip the car, to get a free cup at the station?	
Could a multi-nodal Reykjavik with mixed land use help us out?	Could the name "Aura Borealis" get tourists aboard?	How do we make PT hip and cool?

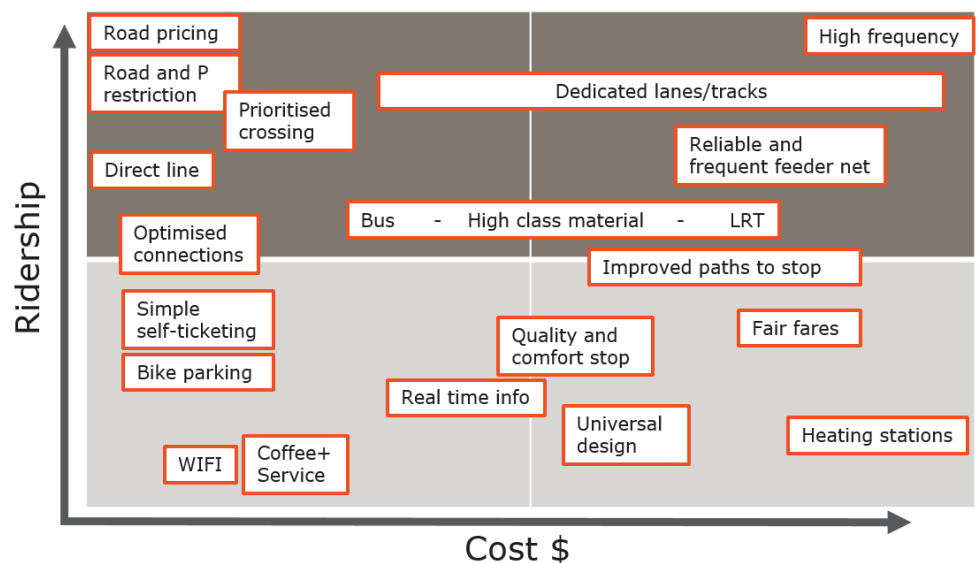


- > Practical, feasible and tempting
- > PT should be the natural first choice
- > Promote sustainable lifestyle – new way of thinking
- > Change the image of PT from not to hot (hip and cool)

Service visions/planning principles:

- > Frequency between 10 min and 5 min headway
- > High speed – few stop: Hafnarfjörður-city center – 10 stops
- > High reliability
- > High coverage is important – prioritise coverage where the need is
- > Max 1 change on the way
- > Must bind together the nodes from a direct line

The input from the groups were put into a matrix that differentiate according to effect on ridership and cost. The measure in the top left corner is cheap for the bus service (free) but gives a lot of extra passengers in the public transport. In the top right corner is another measure that attracts a lot of passengers, but this means increased operating costs as well.



The exact location of the measures in the matrix is subject for discussions as it is impossible to find a unique "cost-benefit-location", but it gives an identification of the effect on ridership and cost of the different measures.

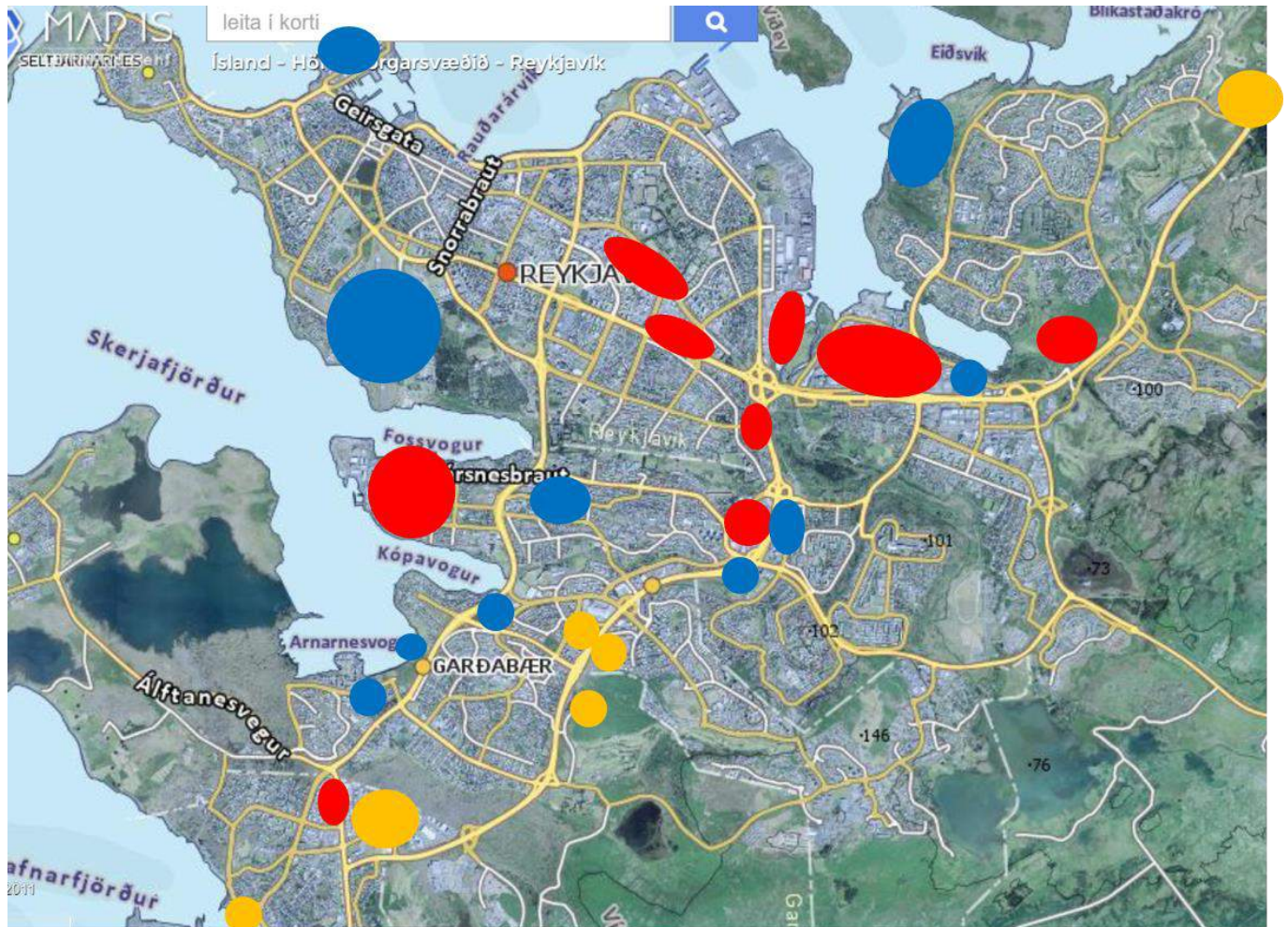
Urban transformation of Capital Area of Reykjavik

Work questions to identify:

- > *Greenfield areas for urban development*
- > *Brownfield areas for urban development*
- > *Areas for developing existing urban structure by densification, mixed use, beautification or social boost*

Every group pointed out these areas at maps of Capital Area of Reykjavik.

- > In total **85** different areas were pointed out
- > **9** areas in common for all groups (**red marking**)
- > 5 out of 6 groups had **10** areas in common (**blue marking**)
- > 4 out of 6 groups had **6** areas in common (**yellow marking**)
- > 3 out of 6 groups had **14** areas in common
- > 2 out of 6 groups had **12** areas in common
- > **34** solo identified areas



3.5.2 Day 2

What is the traffic problems today?

The groups were asked to point out locations where there are traffic problems today in Capital Area of Reykjavik. The focus in all groups were roads with congestion problems or interchanges that are affected by traffic jam.



Figure 2 Identified traffic problems in Reykjavik at the workshop. Pink is what most groups agreed on and green is what the majority agreed on. Circles is intersections with traffic jam.

High class corridors

Work questions to identify:

- > *Are these high class corridors the right ones? (missing some corridors – or some not necessary?)*
- > *Can you prioritize the corridors (10 km at a time)?*
- > *How should a bus network be planned to support the high class corridors? (try to outline an example of how to adapt the supporting bus network in a smaller area based on guidelines for service levels)*

All groups did point out relevant corridors and did prioritize them as well. No groups did have the time for plan the supporting bus network for a smaller area based on guidelines for service levels. The focus were at the corridors and prioritizing.

The majority of the groups has a corridor from Hafnafjordur as the first priority and followed by a corridor from Grafarvogur or Vesturlandsvegur and in the longer perspective extended to Mosfellbær.



How to access the city center were a more difficult task as there are 3 logical ways (Sæbraut, Hverfisgata or Miklabraut/Hringbraut). And the domestic city airport is a fourth access towards the city center via Kársnes.

Measures that will work in Capital Area of Reykjavik

Work questions to identify:

- > Which measures do you think will work in Capital Area of Reykjavik?
- > Which measures do you think can be implemented in Capital Area of Reykjavik?

There came up good discussions in the groups about restrictive measures that will reduce car traffic and thereby benefit the use of public transport.

Toll or road pricing seemed not to be a measure that should be brought into the project. Most groups did not like this restrictive measure or did not mention it.

Most groups positively discussed of working with parking strategies that could:

- > decrease the number of parking lots
- > relocate the parking lots from the inner city center (longer walking distance)
- > increase the parking price (or even offer free public transport for students instead of free parking as today)
- > reduce number of free parking
- > higher fines for illegal parking

Most groups also positively discussed sustainable urban development by:

- > low car ownership in urban development close to stations
- > low parking norms in urban development close to stations
- > densification close to stations

Some groups positively discussed limitations or restrictions for car traffic in the city center by:

- > Restrictions on how many cars can you own in the city center
- > Stop improving road capacity
- > Road prioritised only for eco-friendly cars
- > BRT/LRT will not add new lanes but use existing

Also measures such as:

- > Bike and ride is very important – makes a larger area accessible
- > Collaboration with schools and companies
- > Adjusting meeting times
- > Companies could help limit the car use
- > Toll ring should implemented - differ on different car types
- > Share of elderly people will rise – keep this market segment in mind – stop-distance may have to be lower