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VEGAGERDIN

# Transport Model for the capital area of Iceland - SLH

DOCUMENTATION


MANNVIT

COWI

ADDRESS COWI A/S
Parallelvej 2
2800 Kongens Lyngby
Denmark

TEL +45 56 40 00 00
FAX +45 56 40 99 99
WWW cowi.com

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# CONTENTS

# 1 Introduction

COWI and Mannvit have developed a Multimodal Transport model for the Capital area of Reykjavik (SLH). The model is a strategic transport planning tool, that supports analysing different local and regional development scenarios. The model enables to analyse the impacts of both changes in travel demand, choice of transport modes and traffic volumes on existing and future networks. This includes e.g. new road infrastructure projects like a ring road, a new BRT system, changes in current buss system and/or upgrades to the bicycle network. The model also includes city development projects like changes in parking policies, introducing road pricing, changing the price structure of public transport etc.

The transport model is developed in the software PTV VISUM (version 18). The software has all required built-in functions for multimodal transport modelling, but also several additional functionalities possible to further development of the model for future changes in transport demand.

SLH is developed with a customized user interface on top of VISUM that enables both experienced VISUM users and users without VISUM knowledge to manage editing network, completing model calculations and export relevant model results. The customized interface also reduces manual work in SLH and thereby reduce the possibilities of human mistakes during calculations.

The development of the SLH model system includes knowledge from other Nordic Transport models in Denmark, Norway, Sweden and Iceland. The base model of SLH is based on an existing Transport model in VISUM developed by Albert Skarphéðinsson in 2009 (A thesis at Lunds University) and the model system are adjusted mainly based on experience from transport models from Norway.

## 1.1 Scope of modelling

The Transport Model is a Multimodal Transport Model for passenger and freight transport, which covers the whole area of greater Reykjavik. The SLH transport model enables to analyse the impacts of different land use plans or transport development scenarios, which influence both travel demand, choice of transport modes and traffic volumes on existing and future networks or development plans. This includes e.g. infrastructure programmes comprising combinations of new road infrastructure projects like an Expressways, relief roads, bypasses, new public transport supply like light rail, BRT or railway, improvements of the bus system and implementation of toll roads. It also includes changes in place of residents or workplace locations. The model will also be able to examine policy options like changing the price structure of public transport, transport costs and road user charges, including toll roads.

## 1.2 SLH Coverage

The SLH covers the capital area of Reykjavik and the main corridors to the city. Additionally, SLH covers the area just south of Hafnarfjörður (Hvassahraun), where a proposed site for a new airport is located, see Figure 1-1. Areas outside the capital area on Iceland will furthermore be introduced as external zones in order to represent all travel activities with origin and destination inside the Capital area. Akranes, Reykjanesbær, Selfoss and Hveragerði will be incorporated as external zones in the model network.

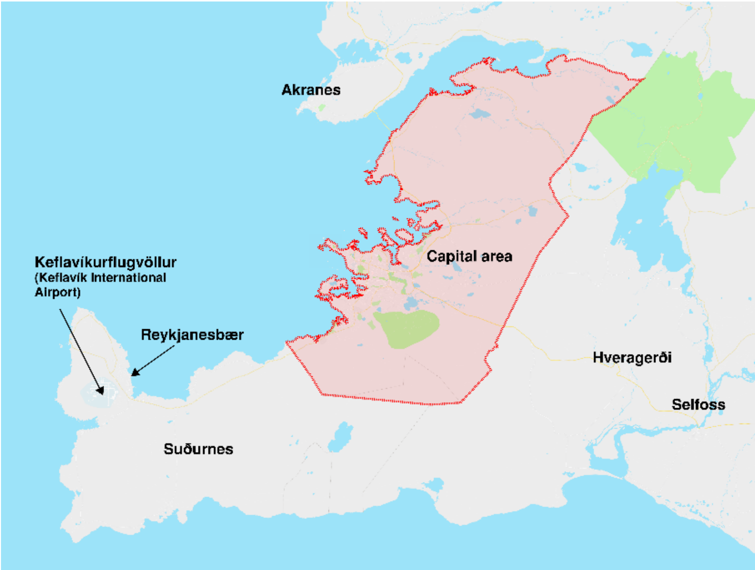



*Figure 1-1 Model area*

Keflavik Airport is a special case as the airport represents a location with high workplace intensity, but also domestic and international aviation travel activities. The airport is modelled as an external zone, but the tourism travel is handled separately with specific tourism growth rates.

The SLH describes both Private Passenger Transport on the main road network and Public Passenger Transport supply of busses. Freight transport is considered in a parallel model but distributed on the same network as the private and public transport to include the mutual influence on road capacity, travel speed and congestion on the road network.

# 2 Transport models and model methodology

The overall model specification is based on standard model theory, having a demand model that estimates the number of trips between each model zone with different transport modes, and a route choice model that distributes the trips to the optimal routes in the network.

The overall structure of the transport model setup is illustrated in Figure 2-1 and described shortly below:

- The trip generation estimates the total number of trips between each model zone (*i*) based on households and workplaces. This model step is described in section 3.1

- The mode- and destination model is a nested logistic choice model that distributes the trips amongst the model zones (*ij*) based on utility theory where the zonal pairs with the lowest travel resistance have the highest probability of travel activities. The model step is described in section 3.3.2

- The route choice model is also based on utility theory, where the traffic is distributed to the optimal route between zone *i* and *j* with mode *k*. The route choice model includes road capacity, intersection delays as also described in section 3.3.4

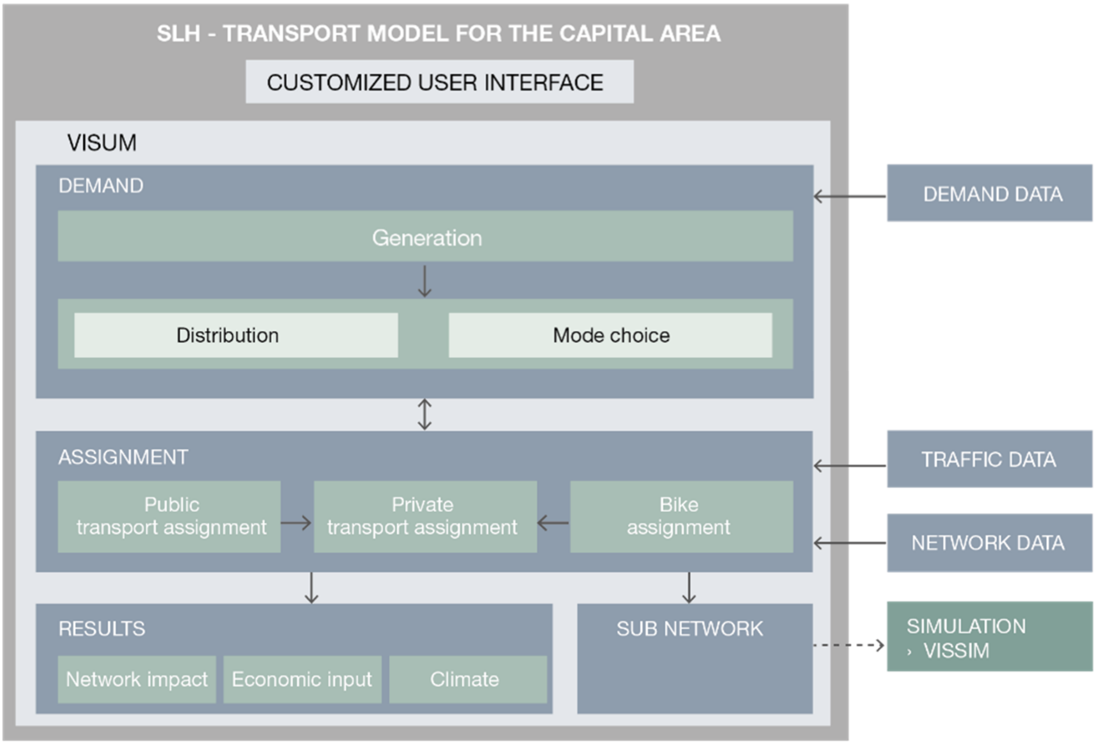



*Figure 2-1 Model structure of SLH*

The model parameters applied in the trip generation module are based on the Icelandic travel survey from 2017, whereas the model parameters of the mode-destination model are based primarily on the model parameters from Norwegian transport models. Unit prices are applied are shown Appendix J. If parameters or variables are not available from these three sources, general trends from other Scandinavian studies are applied.

The demand model is calibrated to the present situation, based primarily on the Icelandic travel survey from 2017. The route choice model is calibrated to present traffic counts (year 2019).

## 2.1 PTV VISUM software

The SLH Transport Model is built in the commercial transport modelling software PTV VISUM (version 18). VISUM is developed by the German company PTV. PTV VISUM is a state-of-the-art software for traffic modelling and is currently worldwide the most frequently applied software for transport modelling. VISUM has during the last 30 years been developed by PTV to be the transport modelling software, which can address most traffic model issues and is still being developed towards future traffic solutions like autonomous vehicles, vehicle-sharing, Ride-sharing, Mobility-As-A-Service (MaaS) and real-time traffic forecasts.

# 3 Model development and calibration

The overall model system is a transport demand and transport supply equilibrium based on utility theory assuming that each single traveller optimizes own perceived travel costs, described from transport network impedance.

Transport demand is described with trip matrices estimated from a trip generation module as described in section 3.3.1 and a trip distribution and mode choice module as described in section 3.3.2. The transport supply is the distribution of the travel matrices to the model network (route choice), described in section 3.3.4. When traffic volumes lead to congestion problems, the overall quality of the model network is reduced and might influence travel demand by lower transport demand or other choice of transport modes.

The network quality is described from network impedance measures, which is the weighted travel costs of travelling between each model zone pair. The network impedance is the sum of travel time, travel costs and out of pocket costs, priced from Value of time costs, distance dependent travel costs and the sum of e.g. ticket prices, road toll etc. The overall model settings are described in section 3.1 and the network building blocks are described in section 3.2.

## 3.1 Demand segments

The population and travel activities are segmented into sub-categories as illustrated in Figure 3-1. The population is distributed relative to house types and car ownership. The travel activities are estimated for 6 travel purposes and the travel activities are grouped into 5 transport modes, from where three modes are distributed to the model network. The estimated travel demand is furthermore segmented into 4 time periods.

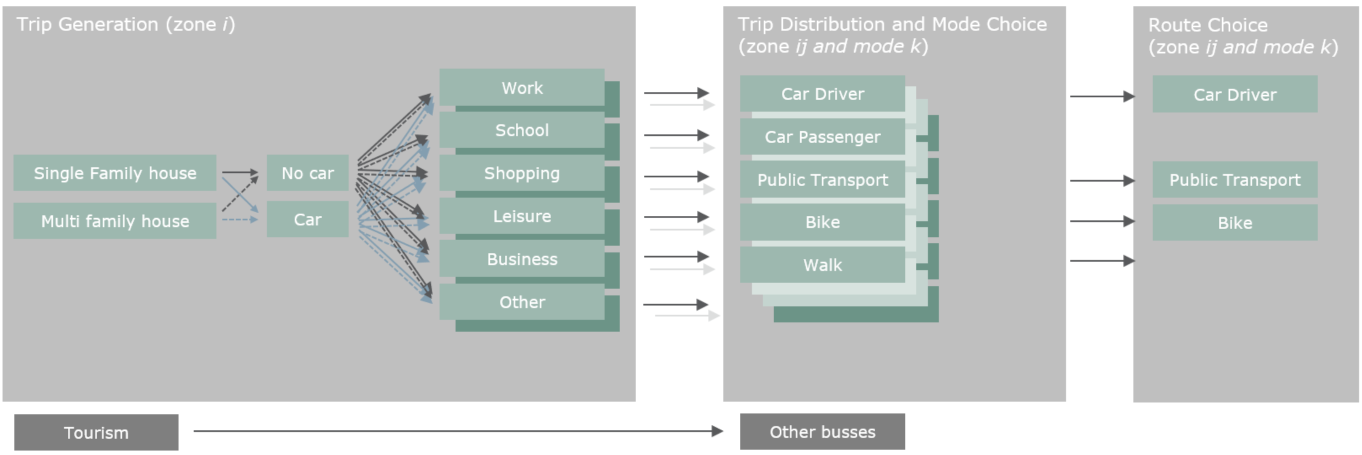



*Figure 3-1 Model structure of SLH*

### 3.1.1 Transport modes

The transport model considers the 5 different transport modes for passengers, where Car, Public Transport and Bike are distributed to the model network:

- Car
- Car passenger
- Public transport
- Bike
- Other modes

The transport model is considering 2 different transport modes for freight:

- Trucks
- Delivery Trucks

### 3.1.2 Travel purposes

The model includes variation in travel behaviour, depending on the purpose of the travel activity. Leisure activities are most commonly longer distance trips with longer duration, compared to shopping trips and errands, that are often short distance and short duration trips. The travel activities are grouped into the 6 purposes:

- Work trips
- School trips
- Shopping trips
- Leisure trips
- Business trips
- Other trips (e.g. errands)

### 3.1.3 Time periods

The transport model includes the time of day variation with 4 time periods:

- AM: 7:45-8:45
- PM1: 16:00-17:00
- PM2: 17:00-18:00
- Off-peak: Average weekday traffic exclusive the peak hours.

#### Peak hour travel

The final matrices are distributed into three peak hour matrices. The split is based on the time-of-day profile shares estimated from the travel survey data illustrated in Figure 3-2. The split ensures that most home-to-work and home-to-education trips are morning peak transport, whereas the return trips are distributed to off-peak and afternoon peak periods.

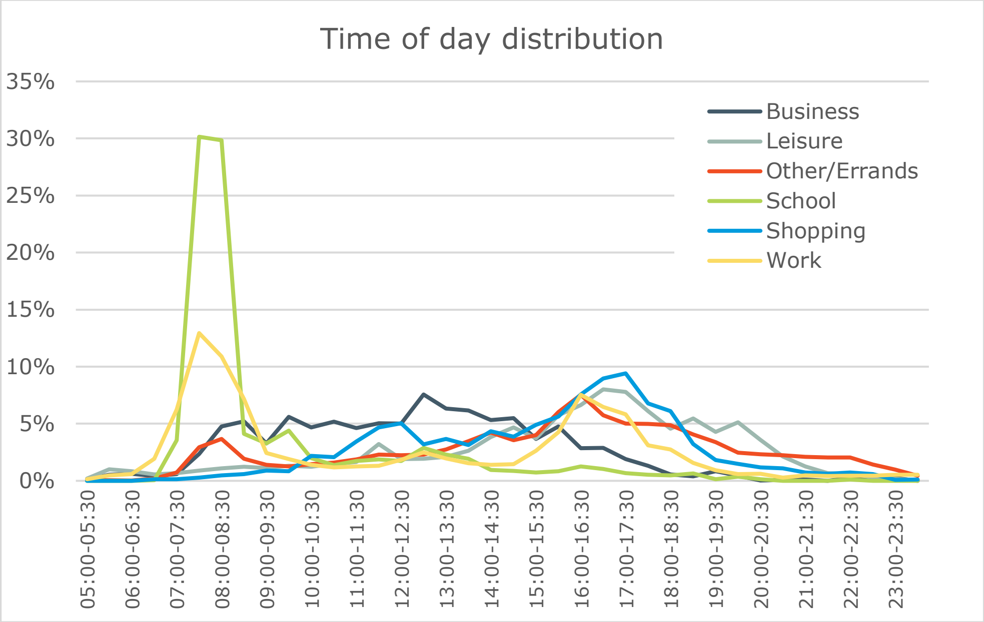



*Figure 3-2 Time of day distribution, based on travel survey data*

For public transport, the matrices are not divided into peak hour and off peak matrices, but the traffic is distributed into time band shares, as illustrated in Figure 3-3.

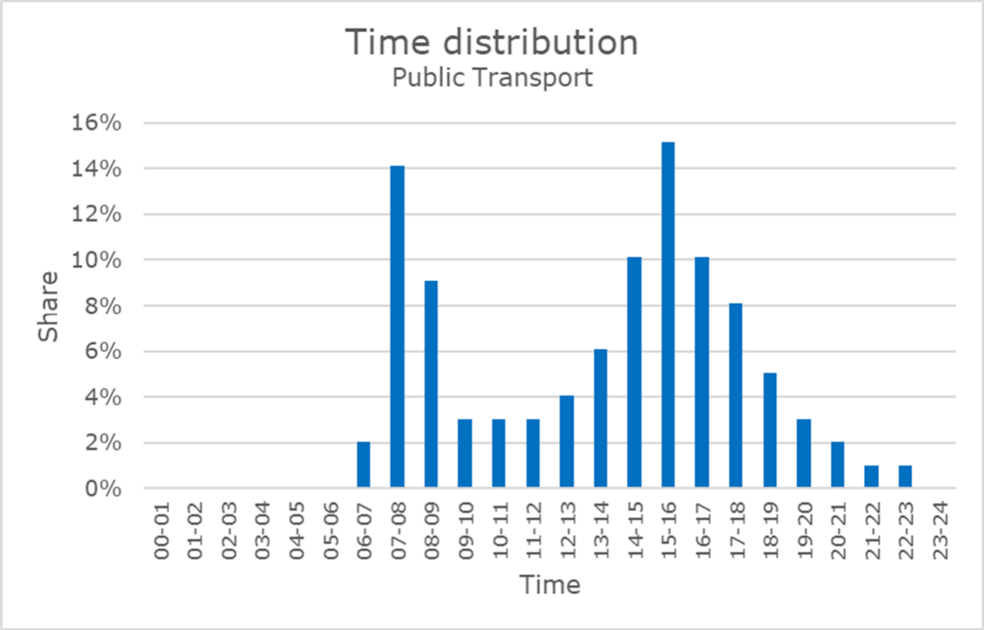



*Figure 3-3 Day profile shares used to for travellers in public transport into time intervals based on the time of day distribution registered in the travel survey.*

## 3.2 Model network

The VISUM model network consist of zone polygons that describe the local attributes like population, household and employment, but also parking restrictions and other settings that might vary across the model area. The model zones summarise the travel activities to and from each model zone. The transport network is described from nodes, links and turn movement restrictions. The public transport systems use the same network with specified line routes and stop points.

The following sections describe the single model network units with the required settings in the SLH model system.

### 3.2.1 Zones

The transport model area is grouped into 338 model zones and 10 external zones describing transport outside the model area, including aviation from Keflavik Airport. The zone structure and its geographical data origins from Reykjaviks geographic land use database (LUKR/Borgarvefsjá)[1]. 29 zones from the model periphery, are merged into 10 larger zones.

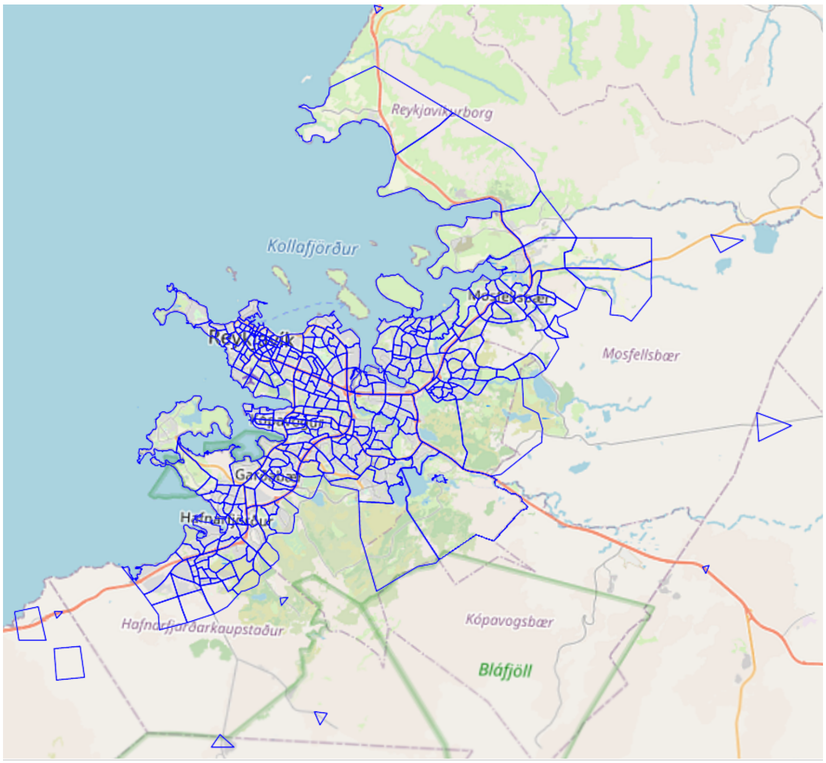



*Figure 3-4 Model zones*

The demand for transport is based on the zone characteristics in Table 3-1. The implementation of the base data is further described in section 3.3. The full list of user defined attributes is listed in Appendix B. Table 3-2 shows the relevant model attribute settings for zones that might differ between each zone and between the base model and forecast models.

[1] Date of extraction is 22.08.2019

| Name | Description |
|---|---|
| TG_Multifamily<br>TG_Singlefamily | Number of single-family households and number of multi-family households |
| TG_Schools | Number of students[2] |
| TG_Workplace1,<br>…<br>TG_Workplace7 | Area of workplaces in 7 categories, see Appendix B for details |
| Parking Free | Number of free parking lots |
| Parking paid | Number of paid parking lots |
| Parking share | Share of available free parking lots available for leisure and shopping purposes |
| Parking cost | Price per hour (ISK) |

*Table 3-1 Summary of user defined attributes applied as model base data. The full list of attributes is listed in Appendix B*

| Name | Description |
|---|---|
| Type | Type 1 is normal model zones included in the demand model, type 2 is external zones, type 3 is airport zones |
| SharePrTOrig | If private transport from the zone is distributed to the connectors by shares, the attributed is checked ☒ |
| SharePrTDest | If private transport to the zone is distributed to the connectors by shares, the attributed is checked ☒ |
| SharePuT | If public transport is distributed to the connectors by shares, the attributed is checked ☒ |
| MethodConnShares | The method applied for distributing the traffic by shares |

*Table 3-2 Model attributes settings for zones*

### Connectors

The traffic volumes estimated for each model zone is distributed to the road network by connectors. The connectors are connected to the road network on

[2] Number of students in SLH are only for Icelandic second schools (Menntaskólar) and universities. Number of students for Primary schools are not covered in SLH. Number of students for secondary schools are extracted from their homepages and/or annual economic report for 2017 or 2018 (schools operated in 2019).
Regarding the number of students in universities the numbers for 2018 University of Iceland has 12.470 students, Reykjavik University has app. 3.500 and Iceland Academy of the arts has 440 students.

small access roads. Traffic is distributed to the network, where most of the zone activities are expected to travel from or to.

| Name | Description |
|---|---|
| Type | Connectors with different access settings varies in type number. Type 0 is external zones, type 7 is for all transport types, type 8 is only for public transport passengers and type 9 is only for private transport. |
| TSysSet | Allowed vehicles on the connector |
| Length | Travel length |
| T0-TSys | Travel time |
| Weight(PrT) | If zone traffic are distributed by shares, the weights are defined for Private Transport as Weigh(PrT) and for Public Transport as Weight(PrT) |

*Table 3-3 Model attributes settings for connectors*

### 3.2.2 Private transport (PrT)

The private road network is based on links, connected in nodes. The model links describe the characteristics of the roads, with travel times estimated from travel speed and capacity restraints. The model nodes describe the characteristics of an intersection include delays that varies between different node types.

#### Links

The base road network describes the main 2019 road network inside the model area. The single road elements are described from a series of attributes with the most relevant listed in Table 3-4. The network included in the model is illustrated in Figure 3-5.

| Name | Description |
|---|---|
| Type | The Link Type defines the base settings of the roads. See Appendix C for detailed settings for each Link Type |
| Name | Name of the road |
| TSysSet | Allowed vehicles on the link (specified from the Link Type) |
| Length | Road length |
| V0-PrT | Allowed speed (specified from Link Type) |
| Number of Lanes | Number of lanes (specified from Link Type) |
| Cap-PrT | Capacity per hour (specified from Link Type) |
| Bike_Kali | Calibration factor for bikes |
| PrT_Kali_AM | Calibration factor for car, HGV and DT during morning peak |
| PrT_Kali_PM | Calibration factor for car, HGV and DT during afternoon peak |
| PrT_Kali_offPeak | Calibration factor for car, HGV and DT during off peak |
| Buslanes | Road has Buslane. |
| PathQuality | 1 for low quality and 3 for high quality bike lane. |

*Table 3-4 Model attributes settings for links*


*Figure 3-5 Road network*

The model network contains 164 predefined link types. The link attributes defined for each link type determine the main settings of the single road elements, e.g. Allowed vehicles, Number of lanes, road capacity, travel speed.

The link types are grouped into the 7 main categories as listed in Table 3-5. The total list of link types is listed in Appendix C.

| Link type number | Description |
|---|---|
| 1-9 | Special roads, closed for cars, roundabouts and shunts |
| 10-28<br>110-128 | Grade separated Highways with access for Bikes<br>Grade separated Highways without access for Bikes |
| 29-45<br>129-145 | Highways with access for Bikes<br>Highways without access for Bikes |
| 46-59<br>146-159 | Urban roads class 1 with access for Bikes<br>Urban roads class 1 without access for Bikes |
| 60-69<br>160-169 | Urban roads class 2 with access for Bikes<br>Urban roads class 2 without access for Bikes |
| 71-73<br>171-173 | Urban roads class 3 with access for Bikes<br>Urban roads class 4 without access for Bikes |
| 80-85 | Bike, Walk and Bus links |

*Table 3-5 Link type main groups in the VISUM model*

### Nodes and Main Nodes

The characteristics of intersections is managed from a node type number and a defined control type. The relevant node attributes are listed in Table 3-6 and the applied node type number and corresponding control types are listed in Table 3-7.

Delays and capacities through intersections are managed from the link type numbers, having standard delays and capacities for the nodes. All signalized intersections and large two-way stop with separate lanes for left turns are modelled with ICA (Intersection Capacity Analyses) and blocking back. Intersections with ICA are specified in the node attribute "Use ICA"

When using ICA, the turn capacity and default delays are modelled based on junction geometry and signal controls. The blocking back calculation ensures that the traffic volumes used for ICA is realistic, i.e. that the queue lengths reduces capacity on the access links. Signalized intersections with ICA have node type number 14. Two-way-stops intersections with ICA have type number 17 otherwise it is type number 7.

Roundabouts are coded as main nodes to improve modelling of all turn movements in the roundabout.

| Name | Description |
|---|---|
| Type Number | The type number defines which turn movement restrictions in the different nodes, see Table 3-7 |
| Control Type | Possible node settings: Unknown, Uncontrolled, Two-way stop, Signalized, All-way stop, Roundabout, Two-way yield |
| Use ICA | If the node use ICA in the calculation, the attributed is checked ☒ |

*Table 3-6 Model attributes settings for nodes*

| Type Number | Control type | Comment |
|---|---|---|
| 0 | Unknown | Node, without an intersection |
| 2 | Uncontrolled | Merging section |
| 14 | Signalized | Signalized intersection |
| 6 | Roundabout | Roundabout |
| 7 and 17 | Two-way stop | Yield intersection |

*Table 3-7 Node types used in SLH, type 14 and 17 are modelled with ICA*

### Turn movements

Besides for nodes using ICA, the turn movements in the remaining model nodes are assigned to turn standards, with predefined travel time delay and capacity for all possible turn movements.

For nodes without using ICA, the BPR relation is applied for estimating delays:

$$t_{Cur} = t_0 \cdot \left(1 + a \cdot \left(\frac{q}{q_{max} \cdot c}\right)^b\right)$$

| | |
|---|---|
| $t_{Cur}$ | *Congested travel time* |
| $t_0$ | *Free travel time* |
| $q$ | *Traffic volume* |
| $q_{max}$ | *Max capacity* |
| $a, b, c$ | *Positive constants describing the volume delay functions. a=1.56, b=5 and c=1* |

For nodes using ICA, VISUM standards settings are applied:

- For signalized intersections, the standards from HCM 2000 is applied,
- For roundabouts, the standard from HCM 2010 is applied and
- for Two-way stops, the HCM 2010 is applied.

The ICA calculations for signalized intersections uses implemented signal settings with defined cycle time, green time etc based on current signal plans provided by Reykjavik city in autumn 2019.

As for the model links, it is defined which vehicles are allowed for each turn movement. As a base setting, all vehicles are allowed for all turn movements except for U-turns. If U-turns are open for traffic, this needs to be defined for the specific turn movement. If other turn movements are not allowed for all vehicles, the allowed vehicles should be defined for the specific turn movement.

| Name | Description |
|---|---|
| Type Number | Type Number 1 is right turn, type number 2 is straight, 3 is left turn and 4 is U-turn |
| TSysSet | Allowed vehicles for the specific turn movement |
| Capacity | Turn movement capacity (defined from turn movement standards for the Node Type) |
| T0-PrT | Turn movement travel time (defined from turn movement standards for the Node Type) |
| U-turn allowed | Is it allowed to do U-turns in? |

*Table 3-8 Model attributes settings for turns*

#### Traffic counts and calibration

Traffic counts of cars, trucks and delivery trucks are used for the model calibration. Both roadside counts and intersection counts are implemented as user defined attributes in the model network used for calibration of the overall travel flows.

The roadside counts are added as user defined attributes for model links. The counts are grouped into the 3 peak hour periods. For old traffic counts, the counts are projected to 2019. Most weight is put on the newest traffic counts during calibration.

The intersection counts register travel movements in intersections. These are added as user defined attributes for turns.

### 3.2.3 Public transport (PuT)

The public transport lines are defined for the same road network as for private transport. Road sections only allowing bus traffic has a predefined link type, see Table 3-5. All bus stops are placed on nodes and the bus lines are defined as routes between the stop points using the road network.

The road network is used for access and egress routes to the bus stops if the links are open for the public transport access mode "PuTWalk". The road network is also used as walk routes when transferring between bus routes. For bus hub areas with several bus stops and high transfer activity are grouped into Stop areas.

| Name | Description |
|---|---|
| Stop point | The public transport stop points where passenger access/egress the public transport mode |
| Stop area | Area that combine the stop with the access/egress network |
| Stops | The overall stop unit that combine the stop points and stop areas to a common stop or station |
| Line | The bus or BRT line with unique line name or number |
| Line route | The different line routes for each single bus or BRT line |
| Vehicle journey | The single bus or BRT departures |
| Time profile | Travel times and stop times between the single stops |

*Table 3-9 Public transport network elements*

The public transport system is implemented with spring 2019 timetables. The line routes implemented in the base model are listed in Appendix D.

The public transport system influences the road capacity and consequently the assignment of road traffic, but potential delay of busses from traffic volumes does not influence the public assignment. These delays are expected to be included in the timetables. For roads with bus lanes, it is assumed that busses are not influencing the private transport system (the number of lanes for the private transport is reduced by the bus lane).

The prognose model includes different BRT scenarios, where busses have high priority and separated bus lanes. It is assumed that high bus priority attracts more passengers than traditional busses because of more continuous driving patterns. This impact is considered similar a rail factor, however with half the attraction impacts than found for rail and light rails (rail factor is applied from transport models in Denmark). The uncertainties related to this rail factor is big as no study on the attraction factor for BRT solutions are available for Iceland.

### 3.2.4 Bike

The bike network is similar the network for private transport however, some link types are not accessible for bikes and others are only allowed for bikes. Three types of specific bike link types are included in the model as listed in Table 3-10. The bike paths have been categorised into tree classes with attribute “Path quality” were class 3 is the best. Bicycle paths that are separated from pedestrians have the highest quality.

| Link Type | Description |
|---|---|
| 80 | Bike paths (dedicated lanes) |
| 81 | Bike path (Mixed pedestrians and bikes) |
| 82 | Bike path (low quality) |

*Table 3-10 Specific bike link types.*

### 3.2.5 Trucks and Delivery Trucks

There is no specific demand model for the freight transport (trucks and delivery trucks), but it is presumed that the overall OD flows are similar the estimated flow for cars. The matrix sizes are defined by percentage shares based on traffic counts. Trucks represents 4% of the car volumes and delivery trucks represents 8% of the car volumes.

## 3.3 Transport Model

The transport model is based on three main model stages; a trip generation model that estimates the total number of trips produced and attracted in each model zone, a mode-destination model, that estimates travel matrices for each single transport mode, and an assignment model (route choice), that distribute the traffic matrices to the road network and the public transport system.

### 3.3.1 Trip generation model

The trip generation model is a linear frequency model based on cadastral data (Matseiningar data) summarised at zonal level. For each model zone, the model estimates the number of trips produced per household and the number of trips attracted by workplaces. The trip rates are estimated from the Icelandic travel survey data (from October-November 2017[3]). The travel survey is individual based and registers personal travel activities, but also register some household information.

Before deciding on the segmentation of the population into households, different parameters were analysed from the travel survey data to outline which variables seems to have evident impact on travel frequencies, travel purposes, and transport modes. Socioeconomic characteristics might influence travel behaviour and it is often the case that households with children travels more than households without children, and households with car travels differently than households without car. Some of the key variables analysed are summarized in Appendix A.

[3] Project number 4027650
http://ssh.is/images/stories/Samgongumal/2017Ferdavenjur/01_4027650_Ferdavenjur_a_hofudborgarsvaedinu_080118.pdf

It is decided to apply building units as base data of the model, as households and workplaces are easier to apply for prognoses years than e.g. number of inhabitants in different age groups.

Due to the limited sample size of the travel survey, the trip rates are estimated on two household types, divided into six main travel purposes. As the sample sizes are too limited to estimate trip rates segmented into both travel purpose and households with and without car, the population is secondly divided into households with and without car. The car ownership variables are also based on the travel survey data.

### Trip production

The trip rates estimated from the travel survey is number of trips per person in each household type (Single-family house and multi-family house) and the six travel purposes as listed in Table 3-11. To apply the trip rates for households, the individual based trip rates are scaled to the total number of trips produced by the household using average household sizes[4].

Table 3-11 shows the estimated trip rates per person together with the sample sizes. The table furthermore includes the average household size and the average distribution of households with and without car. These factors are applied to scale the household to the number of persons and to divide the households into households with and without car.

---

[4] The average household size in the model area is estimated on the total number of inhabitants and total number of households in the model area. From the travel survey it is found that the household size of single-family houses is 15% higher than average and 9% lower in multifamily houses.

| Travel purpose | Single-family houses (SF) | | Multi-family houses (MF) | |
|---|---|---|---|---|
| | Trip rates | Sample | Trip rates | Sample |
| Work ($\beta_W$) | 0.51 (24%) | 2.675 | 0.52 (26%) | 3.902 |
| School ($\beta_{Sc}$) | 0.18 (9%) | 535 | 0.13 (6%) | 633 |
| Shopping ($\beta_S$) | 0.16 (8%) | 822 | 0.17 (9%) | 1.330 |
| Leisure ($\beta_L$) | 0.30 (14%) | 1.309 | 0.27 (14%) | 1.891 |
| Business ($\beta_B$) | 0.10 (5%) | 525 | 0.08 (4%) | 574 |
| Other (e.g. errands) ($\beta_O$) | 0.84 (40%) | 3.823 | 0.82 (41%) | 5.756 |
| **Total** | **2.1** | **9.689** | **2.0** | **14.086** |
| Persons per household (σ)* | 2.8 | | 2.2 | |
| Share having car (δ) | 99% | 2.297 | 94% | 3.379 |
| Share without a car (1-δ) | 1% | 15 | 6% | 184 |

**) estimated on population statistics and adjusted from travel survey*

*Table 3-11 Trip generation parameters based on the travel survey 2017 data (The trip rates ($\beta$) describes the number of trips generated per household. The travel patterns are assumed symmetric.*

The overall trip rates are 4.2 per single-family houses and 4.0 per multi-family houses. This correspond to 2.1 and 2.0 trips generated per household and 2.1 and 2.0 attracted per household.

The trip rates indicate that persons living in multi-family houses have fewer leisure, school, and business trips and consequently the work trips represent a larger share. This is influenced by e.g. the composition of household members, having a higher share of families with children in single family houses. This is also indicated from the 3.8 persons in single family households compared to the 3.3 persons in multi-family houses.

As also illustrated in Table 3-11, the share of households without a car is very limited. Car ownership is however included in the model to implement the flexibility of analysing future scenarios with changes in the accessibility of car. The approximation used in the model assumes that the 2.8 or 2.2 household members, all have great access to car and consequently have similar travel behaviour. The segmentation does not consider the number of cars per household, neither the number of household members with a driver license.

The number of produced trips from zone $i$ with travel purpose $t$, is estimated from the examples below.

$$P_i^{t,Car} = \delta^{SF} \cdot \sigma^{SF} \cdot \beta_t^{SF} \cdot X_i^{SF} + \delta^{MF} \cdot \sigma^{MF} \cdot \beta_t^{MF} \cdot X_i^{MF}$$

$$P_i^{t,No\ Car} = (1 - \delta^{SF}) \cdot \sigma^{SF} \cdot \beta_t^{SF} \cdot X_i^{SF} + (1 - \delta^{MF}) \cdot \sigma^{MF} \cdot \beta_t^{MF} \cdot X_i^{MF}$$

| | |
|---|---|
| $P_i^{t,Car}$ | *Produced number of trips with travel purpose $k$ in zone $i$ for households with car* |
| $P_i^{t,No\ Car}$ | *Produced number of trips with travel purpose $k$ in zone $i$ for households without car* |
| $X_i^{SF}, X_i^{MF}$ | *Number of single-family (SF) and multi-family (MF) households in zone $i$* |
| $\beta_t^{SF}, \beta_t^{MF}$ | *Trip rates for travel purpose $t$ in single-family (SF) and multi-family (MF) households as listed in Table 3-11* |
| $\sigma^{SF}, \sigma^{MF}$ | *Average number of persons in single-family (SF) and multi-family (MF) households as listed in Table 3-11* |
| $\delta^{SF}, \delta^{MF}$ | *The share of households with car in single-family (SF) and multi-family (MF) households as listed in Table 3-11* |

### Peak hour commuting

It is assumed that mode choices during peak hours are primary determined from the level of mobility in the morning. For high congested areas during morning peak, public transport or bike might be preferable compared to car and this mode choice is also reflected during afternoon peak.

From the time of day profile in Figure 3-2, the most specific peak hour distribution is for work and school trips. From the time of day profile, it is evaluated that 60% of car trips consider mode choice during the peak hours and 100% of the school trips are peak hour traffic. The 60%/40% work trips are added as a factor in the trip production formula and work trips are grouped into two transport modes, where the 60% peak hour commute traffic consider their mode choice from the network impedance registered during peak and the 40% off-peak travel consider the mode choice from the general network impedance. The 100% school trips consider mode choice based on the peak hour impedance.

### Trip Attraction

The trip generation determines the total level of traffic generated by the households, whereas the trip attraction determines the number of trips attracted by the workplaces, leisure facilities etc.

The workplaces are grouped into 7 main categories as listed in Table 3-12. The attraction rates are based on Swedish attraction rates. As the type of workplaces varies considerably in each category, the Swedish attraction rates are adjusted to averages attraction rates as listed in Table 3-12.

| Workplace categories | | Work | Business | Shopping | Leisure | Other | School |
|---|---|---|---|---|---|---|---|
| $\beta_1$ | Shopping and service (high trip rates) | 0.55 | 0.55 | 0.75 | 0.58 | 0.06 | 0 |
| $\beta_2$ | Shopping and service (low trip rates) | 0.34 | 0.34 | 0.34 | 0.58 | 0.03 | 0 |
| $\beta_3$ | Light industry | 0.20 | 0.20 | 0 | 0 | 0 | 0 |
| $\beta_4$ | Office and Schools* | 0.19 | 0.19 | 0 | 0 | 0.26 | 0 |
| $\beta_5$ | Storage and heavy industry | 0.04 | 0.04 | 0 | 0 | 0 | 0 |
| $\beta_6$ | Specialized (church, prison, cemetery) | 0.04 | 0.04 | 0 | 0 | 0 | 0 |
| $\beta_7$ | Buildings with very small trip rates | 0.02 | 0.02 | 0 | 0 | 0 | 0 |
| $\beta_s$ | Number of student places** | 0 | 0 | 0 | 0 | 0 | 0.30 |

**) Includes number of hotels and schools. The tourism activities to and from Keflavik are handled separately from number of tourist dwelling (GIST_FLM). The travel activities to school are handles separately with βS*
***) Trips to schools are estimated on the number of student students (FJ_NEMENDA) per zone*

*Table 3-12 Trip attraction rates per m² based on Swedish values adjusted relative to the workplace categories.*

The attracted trips per zone per travel purpose are estimated from the relation described below, where $Z_i^1$ is the total number of m² in workplace category 1 and $Z_i^2$ is the total number of m² in workplace category 2 etc.

$$A_j^{Work} = \beta_{work}^1 \cdot Z_j^1 + \beta_{work}^2 \cdot Z_j^2 + \beta_{work}^3 \cdot Z_j^3 + \beta_{work}^4 \cdot Z_j^4 + \beta_{work}^5 \cdot Z_j^5 + \beta_{work}^6 \cdot Z_j^6 + \beta_{work}^7 \cdot Z_j^7 + \beta_{work}^S \cdot Z_j^S$$

| | |
|---|---|
| $A_i^{Work}$ | *Number of attracted trips to zone j* |
| $Z_j^1, Z_j^2, \dots Z_j^8$ | *Workplace m² for workplace category 1-8 in zone j* |
| $\beta_{work}^1, \beta_{work}^2, \dots \beta_{work}^8$ | *Trip attraction parameter for workplace category 1-8* |

### 3.3.2 Mode-destination model

The number of trips from zone $i$, is distributed to travel destinations and transport mode simultaneously from a nested logit model. The trips are estimated for households with and without car separately.

The probability of travelling between two zones are estimated from the estimated impedance between each zone pair for each transport mode. The mode-destination model formulation and model parameters are applied from the Norwegian Transport models (RTM and the Transport model for Rogaland Fylkekommun) and described below. Unit prices are in ISK and based on the assumptions described in Appendix J. The values applied in the model system is listed in section Table 3-16. Besides the impedance, the overall utility function furthermore include variation relative to travel purpose and destination zones.

The utility functions applied in the mode-destination model is the sum of different travel cost components weighted differently across travel purposes and transport modes. This generalised cost furthermore vary relative to travel purposes with alternative specific constants and relative to destination zones with dummy variables:

$$V_{m,ij} = \alpha_m + \beta_m^{tt} \cdot VoT_m \cdot TT_{m,ij} + \beta_m^{cost} \cdot \left(DC_m \cdot Dist_{m,ij} + OOP_{m,ij}\right) + \beta_m^{dummy} \cdot \gamma$$

The probability of choosing mode $m$ between zone $i$ and zone $j$ is described from the multinomial logit model:

$$P_{m,ij} = \frac{\exp\,(V_{m,ij})}{\sum_{j,m} \exp\,(V_{m,ij})}$$

| | |
|---|---|
| $P_{m,ij}$ | *Probability of choosing mode $m$ between zone $i$ and $j$* |
| $V_{m,ij}$ | *Utility for travel activities with mode $m$ between zone $i$ and $j$* |
| $VoT_m$ | *Unit price for travel time for mode $m$* |
| $Tt_{m,ij}$ | *Travel time for mode $m$ between zone $i$ and $j$* |
| $DC_m$ | *Unit price for travel costs per kilometre for mode $m$ between zone $i$ and $j$.* |
| $Dist_{m,ij}$ | *Travel distance for mode $m$ between zone $i$ and $j$* |
| $OOP_{m,ij}$ | *Out-of-pocket costs for mode $m$ between zone $i$ and $j$* |
| $\alpha_m$ | *Alternative specific constants per transport mode $m$* |
| $\beta_m^{tt}$ | *Model parameter for travel time for mode $m$* |
| $\beta_m^{cost}$ | *Model parameter for travel cost (is the same for all modes)* |
| $\beta_m^{dummy}$ | *Model parameter for mode specific dummies* |
| $\gamma$ | *Destination specific dummy variable (1 if true, zero if not)* |

The travel purposes included in the SLH model varies a little from the Norwegian demand models. In the Norwegian models there are no parameters for school activities. In SLH, the parameters for work is transferred to also describe school trips. The Norwegian Transport models uses the travel purposes "pick up and/or bring persons or things" and "Private" which correspond to the "Other" and "Shopping" used in the SLH.

### Synthetic matrices

From the estimated probabilities of choosing car, public transport or bike ($P_{m,ij}$), synthetic matrices are calculated by multiplying the probabilities with the trip production and trip attraction. This ensures the total trip production equals the total number of estimated trips per zone per travel purpose.

$$M_{m,i,j} = G_i \frac{A_j}{\sum_j A_j} \cdot P_{m,i,j}$$

| | |
|---|---|
| $M_{m,ij}$ | *Synthetic matrix for mode $m$ between zone $i$ and $j$* |
| $G_i$ | *Trip generation from zone $i$* |
| $A_j$ | *Trip attraction from zone $j$* |
| $P_{m,i,j}$ | *Probability of travelling with mode $m$ between zone $i$ and $j$.* |

The final matrices used in the route choice model is estimated from a pivot point correction as described in section 3.3.3.

## Car and car driver

The utility function for car and car driver are similar, however with variation in travel costs and parameters. The function and parameters are applied from the Norwegian Transport models and adapted Icelandic relations. Model parameters and factors are listed in Table 3-13.

$$V_{Car,ij} = \alpha_{car} + \beta_{car}^{time} \cdot \left(VoT_{car}^{free} \cdot Tt_{car}^{free} + VoT_{car}^{congested} \cdot Tt_{car}^{congested}\right) + \beta_{car}^{Cost} \cdot \left(DC_{car} \cdot Dist_{car} + OOP_{Cost,ij}\right) + \beta_{car}^{parking} \cdot \gamma_{car}^{parking}$$

$$V_{Carpassenger,ij} = \alpha_{carpassenger} + \beta_{carpassenger}^{time} \cdot \left(VoT_{car}^{free} \cdot Tt_{car}^{free} + VoT_{car}^{congested} \cdot Tt_{car}^{congested}\right) + \beta_{car}^{Cost} \cdot OOP_{Cost,ij} + \beta_{car}^{parking} \cdot \gamma_{car}^{parking}$$

| | |
|---|---|
| $V_{m,ij}$ | *Utility for car or car passenger travel between zone $i$ and $j$* |
| $VoT_m$ | *Unit price for travel time for mode $m$ (car or car passenger)* |
| $Tt_{m,ij}$ | *Travel time for mode $m$ (car or car passenger) between zone $i$ and $j$* |
| $DC_m$ | *Unit price for travel costs per kilometre for mode $m$ (car or car passenger) between zone $i$ and $j$.* |
| $Dist_{m,ij}$ | *Travel distance for mode $m$ (car or car passenger) between zone $i$ and $j$* |
| $OOP_{m,ij}$ | *Out-of-pocket costs for mode $m$ (car or car passenger) between zone $i$ and $j$* |
| $\alpha_m$ | *Alternative specific constants per transport mode $m$ (car or car passenger)* |
| $\beta_m^{tt}$ | *Model parameter for travel time for mode $m$ (car or car passenger)* |
| $\beta_m^{cost}$ | *Model parameter for travel cost (is the same for all modes)* |
| $\beta_m^{parking}$ | *Model parameter for parking* |
| $\gamma$ | *Destination specific dummy variable (1 if there are paid parking, zero if not)* |

$$OOP_{cost,ij} = \frac{(1-\sigma_{share}) + \left(\sigma_{share} \cdot (1-\sigma_{factor})\right)}{\rho_{passengers}} \cdot Toll_{ij}^{car} + \frac{\tau_{factor} \cdot \tau_j^{Paid\_share}}{\rho_{passengers}} \cdot Park_j^{car}$$

$$\tau_j^{Paid\_share} = \frac{P_j^{paid}}{P_j^{Paid} + \left(\frac{\tau_j^{Share}}{100} \cdot P_j^{free}\right)}$$

| | |
|---|---|
| $Toll_{ij}^{car}$ | *Total toll cost for cars between zone $i$ and $j$* |
| $Park_j^{car}$ | *Parking price per hour in destination zone $j$* |
| $\tau_j^{Paid\_Share}$ | *Share of paid parking lots in zone $j$* |
| $P_j^{paid}$ | *Number of paid parking lots in zone $j$* |
| $P_j^{Free}$ | *Number of free parking lots in zone $j$* |
| $\tau_j^{Share}$ | *Share of free parking lots available for leisure and shopping trips in zone $j$* |
| $\sigma_{factor}$ | *Toll discount factor: The price reduction from full price toll cost* |
| $\sigma_{share}$ | *Toll discount share: The share of cars with toll discount, i.e. assuming more commute travel has discount prices.* |
| $\tau_{factor}$ | *Parking costs factor: Average hours parking for leisure and shopping* |
| $\rho_{passengers}$ | *Average number of persons per car* |

The discount factor for car is applied from the Norwegian Transport models, assuming a percentage of the population pays full price and the rest pays a discount price:

$$\sigma_{factor} = \partial \cdot FullPrice + (1 - \partial) \cdot DiscountPrice$$

| Mode destination parameters | | Work | Business | Leisure | School | Shopping | Other |
|---|---|---|---|---|---|---|---|
| $\alpha_{car}$ | Alternative specific constant | 0 | 0.668* | 0 | 0 | 0 | 0 |
| $\alpha_{carpassenger}$ | Alternative specific constant | 0.772 | 0 | 2.08 | 0.772 | 2.365 | 0.95* |
| $\beta_{car}^{time}$ | In vehicle time (car) | -0.0357 | -0.0235 | -0.0339 | -0.0357 | -0.0739 | -0.0505 |
| $\beta_{carpassenger}^{time}$ | In vehicle time (car passenger) | -0.0659 | -0.0129 | -0.0339 | -0.0659 | -0.0628 | -0.0667 |
| $\beta^{cost}$ | out-of-pocket cost | -0.0319 | -0.0076 | -0.0231 | -0.0319 | -0.0445 | -0.0417 |
| $\beta_{car}^{parking}$ | short time parking dummy | 0 | 0 | -0.0393 | 0 | -0.0153 | 0 |
| $\sigma_{factor}$ | Toll discount factor | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| $\sigma_{share}$ | Toll discount share | 0.75 | 0.6 | 0.5 | 0.75 | 0.5 | 0.5 |
| $\tau_{factor}$ | Parking cost factor | 0 | 0 | 2 | 0 | 1 | 0 |
| $\rho_{passengers}$ | (Average persons per car) | 1.18 | 1.18 | 1.18 | 1.18 | 1.18 | 1.18 |

*) *only for households with a car, i.e. having access to a car increases the probability of travelling by car for business travel and other purposes*

*Table 3-13 Utility function parameters in the mode-destination formulation for car*

## Bike and other modes

The choice of taking the bike or other modes depends only on travel time, as the overall travel costs are assumed to be zero:

$$V_{Bike,ij} = \beta_{Bike} \cdot Tt_{bike,ij} \cdot VoT$$

$$V_{OtherModes,ij} = \beta_{OM} \cdot Tt_{OM,ij} \cdot VoT$$

| | |
|---|---|
| $V_{m,ij}$ | *Utility for Bike or travel by other modes between zone $i$ and $j$* |
| $VoT_m$ | *Unit price for travel time for mode $m$ (bike or other modes)* |
| $Tt_{m,ij}$ | *Travel time for mode $m$ (bike or other modes) between zone $i$ and $j$* |
| $\alpha_m$ | *Alternative specific constants per transport mode $m$ (car or car passenger)* |
| $\beta_m$ | *Model parameter for mode $m$ (bike or other modes)* |

| Mode destination parameters | | Work | Business | Leisure | School | Shopping | Other |
|---|---|---|---|---|---|---|---|
| $\alpha_{Bike}$ | Alternative specific constant | 0 | 0 | 0 | 0 | 0 | 0 |
| $\beta_{Bike}^{km}$ | travel length (correlated with travel time) | -0.2191 | -0.146 | -0.303 | -0.2191 | -0.641 | -0.459 |
| $\alpha_{Other}$ | Alternative specific constant | 0 | 0 | 1.040 | 0 | 0 | 0 |
| $\beta_{Other}^{km}$ | travel length (correlated with travel time) | -0.5253 | -0.213 | -0.312 | -0.2191 | -0.641 | -0.459 |

*Table 3-14 Utility function parameters in the mode-destination formulation for bike and other modes*

### Public Transport

The utility function for public transport includes different time components like in vehicle time, transfer time etc. as illustrated in Figure 3-6.

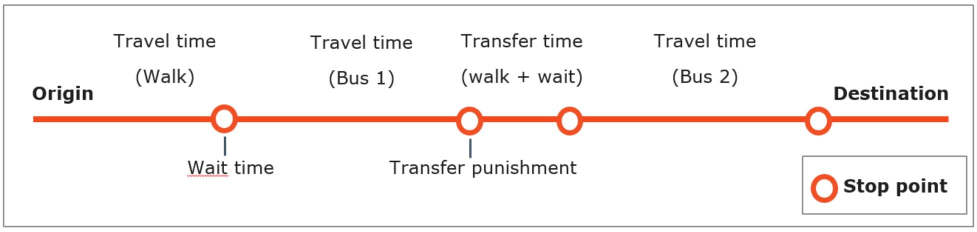



*Figure 3-6 Travel time components of total public transport travel time.*

Besides the time components and number of transfers, the utility function includes an average ticket price and a work density dummy, that increases the probability of shopping trips to the zones with the highest workplace density. The function and parameters are applied from the Norwegian Transport models and adapted Icelandic relations. The time components are *in-vehicle time* ($IVT$), *wait time* ($WT$) and *walk time* ($WK$):

$$V_{PT,ij} = \alpha_{PT} + \beta_{PT}^{IVT} \cdot VoT_{PT}^{IVT} \cdot Tt_{PT,i,j}^{IVT} + \beta_{PT}^{WT} \cdot VoT_{PT}^{WT} \cdot Tt_{PT,i,j}^{WT} + \beta_{PT}^{\sqrt{WT}} \cdot VoT_{PT}^{WT} \cdot Tt_{PT,ij}^{\sqrt{WT}} + \beta_{PT}^{WK} \cdot VoT_{PT}^{WK} \cdot Tt_{PT,i,j}^{WK} + \beta_{PT}^{Transfer} \cdot VOT_{PT}^{Transfer} \cdot N_{PT,i,j}^{Transfer} + \beta^{cost} \cdot OOP_{Cost,ij} + \beta_{PT}^{WorkDensity} \cdot \gamma_{PT,j}^{WorkDensity}$$

*Walk time* ($WK$) is based on 3 separate time components registered in VISUM; *access time*, *walk time* and *egress time*:

$$Tt_{PT}^{WK} = Tt_{PT}^{Access} + Tt_{PT}^{Walk} + Tt_{PT}^{Egress}$$

*Wait time* ($WT$) is based on the two time-components *Origin wait time* and *transfer time*.

$$Tt_{PT}^{WT} = Tt_{PT}^{OriginWaitTime} + Tt_{PT}^{Transfertime}$$

$$Tt_{PT}^{\sqrt{WT}} = \sqrt{Tt_{PT}^{OriginWaitTime}} + \sqrt{Tt_{PT}^{Transfertime}}$$

Finally, the out of Pocket ($OOP$) costs are the average ticket price for public transport trips, that varies between the different travel purposes with different ticket discount factors $\sigma_{factor}$ and discount shares $\sigma_{share}$:

$$OOP_{cost,ij} = \left[(1-\sigma_{share}) + \left(\sigma_{share} \cdot \left(1-\sigma_{factor}\right)\right)\right] \cdot Price_{ij}^{PuT}$$

| | |
|---|---|
| $V_{PT,ij}$ | Impedance of public transport between zone $i$ and zone $j$ |
| $VoT_{PT}^{T}$ | Value of Time for different travel time components $T$: In vehicle time ($IVT$), Wait time ($WT$) and ($WK$) |
| $VoT_{PT}^{Transfer}$ | Value of time per transfer |
| $Tt_{PT,i,j}^{T}$ | Travel time components $T$ between zone $i$ and zone $j$ |
| $N_{PT,i,j}^{Transfer}$ | Number of transfers between bus line routes from zone $i$ to zone $j$ |
| $OOP_{Cost,ij}$ | Out-Of-Pocket costs for public transport between zone $i$ and zone $j$ |
| $\alpha_{PT}$ | Alternative specific constant |
| $\beta_{PT}^{tt}$ | Model parameters for travel time components |
| $\beta^{cost}$ | Model parameter for travel cost |
| $\beta_{PT}^{WorkDensity}$ | Model parameter for work density at destination zone $j$ |
| $\gamma_{PT,j}^{WorkDensity}$ | Work density in zone $j$ |
| $Price_{ij}^{PuT}$ | Ticket price between zone $i$ and zone $j$ |
| $\sigma_{factor}$ | Ticket discount factor: The price reduction from full price toll cost |
| $\sigma_{share}$ | Ticket discount share: The share of cars with toll discount, i.e. assuming more commute travel has discount prices. |

The general ticket price for public transport is 470 ISK per trip (and 235 ISK for discount tickets)[5]. There are however several discount prices for frequent travellers, that needs to be reflected in the average ticket price included as the out of pocket costs for public transport. The discount factor and discount share is estimated from the ticket prices and sale statistics as listed in Table 12-9 in Appendix E.

The estimation of ticket prices assumes e.g. that people with discount cards or period cards travels 20 days per month and the cost of public transport when buying a 1-month period card is 640 ISK compared to the 2x470 ISK if you pay the general fare. It is furthermore presumed that most commuters and students buy period cards or discount cards. For the rest of the travel purposes, the share of travellers with different discount arrangements are assumed to have the same market shares as found in Table 12-9 in Appendix E. Examples:

From the passenger shares provided in Table 12-9, the weighted average daily price is 297 ISK. This correspond to 32% of the total price if you pay 2 times the 470 ISK. The discount factor is defined as 1-0.32 i.e. 0.68. It is presumed 0.57 of the travellers have a discount ticket.

It is assumed that the period cards are primarily used by the commute travellers. The weighted average price for period cards is 446 ISK, or 47% of the general daily ticket price (2x470 ISK). The discount factor for work is set to 1-

[5] The ticket prices are delivered by Strætó in 2019 prices, see in Table 12-9 in Appendix E

0.47 i.e. 0.53. It is a presumption that 90% of the commuting travellers have a discount card i.e. 0.9.

The weighted average price for student cards is 183 ISK per day compared to the 2x235 ISK. It is assumed that 90% of the students pay 183 ISK and 10% pay 2x235 ISK. This results in an average price of 212 ISK per day, which is 32% of the general price. The discount factor is 1-0.23 i.e. 0.77.

| Mode destination parameters | | Work | Business | Leisure | School | Shopping | Other |
|---|---|---|---|---|---|---|---|
| $\alpha_{PT}$ | Alternative specific constant | 0 | 0 | 1.35 | 0 | -2.1* | 0 |
| $\beta_{PT}^{Traveltime}$ | In vehicle time | -0.041 | -0.0109 | -0.0174 | -0.041 | -0.0239 | -0.0667 |
| $\beta_{PT}^{wait}$ | Wait time | -0.0379 | 0 | 0 | -0.0379 | 0 | 0 |
| $\beta_{PT}^{\sqrt{wait}}$ | Square root wait time | 0 | -0.213 | -0.312 | 0 | -0.395 | -0.667 |
| $\beta_{PT}^{Walk=Transfertime}$ | Access, egress and walk time | -0.0209 | -0.0209 | -0.0551 | -0.0209 | -0.0948 | -0.5336 |
| $\beta_{PT}^{Transfer}$ | Number of transfers | -0.2005 | -0.305 | -0.396 | -0.2005 | -0.575 | -0.5336 |
| $\beta_{PT}^{WorkDensity}$ | work density | 0 | 0 | 0 | 0 | 1.43 | 0 |
| $\sigma_{factor}$ | Discount factor | 0.53 | 0.68 | 0.68 | 0.77 | 0.68 | 0.68 |
| $\sigma_{share}$ | Discount share | 0.9 | 0.57 | 0.57 | 1.00 | 0.57 | 0.57 |

*) *only for households with a car, i.e. having access to a car decreases the probability of using Public transport for shopping activities*

*Table 3-15 Utility function parameters in the mode-destination formulation for public transport*

## Unit prices

The applied unit prices for travel time and travel costs correspond to the values presented in Appendix J. For DT and HGV, the factor prices inclusive taxes are applied for the generalised costs in the transport model as the factor price refers to the production costs of the company and not the market prices available for the customers. The unit prices applied in the model system are listed in Table 3-16.

The factor rates for car and public transport origin from the Danish manual for socioeconomic analyses. From this catalogue the congested travel time for DT and HGV is 1.4 times the value of free travel time. This factor is added to the values presented in Appendix J, to be able to divide travel time into free travel time and congested travel time.

The unit prices and factors are applied to the model system as "Network user defined attributes"

| | Private | Business |
|---|---|---|
| Car | | |
| Free travel time (X) | 2,068 ISK | 6,332 ISK |
| Congested travel time (1.5*X) | 3,101 ISK | 9,499 ISK |
| Driving costs | 53.092 ISK | 43.00 ISK |
| Public transport | | |
| Travel time on board (X) | 2,068 ISK | 6,332 ISK |
| Access time (1.5*X) | 3,101 ISK | 9,499 ISK |
| Egress time (1.5*X) | 3,101 ISK | 9,499 ISK |
| First wait time (0.8*X) | 1,654 ISK | 5,066 ISK |
| Transfer time (1.5*X) | 3,101 ISK | 9,499 ISK |
| Transfer "punishment" (0.1*X) | 207 ISK | 633 ISK |
| Walk time (1.5*X) | 3,101 ISK | 9,499 ISK |
| Bike | | |
| Travel time (X) | 2,068 ISK | 6,332 ISK |
| Other Modes | | |
| Travel time (X) | 2,068 ISK | 6,332 ISK |
| Delivery Trucks (DT) | | |
| Free travel time (X) | | 4,974 ISK |
| Congested (1.4*X) | | 6,964 ISK |
| Driving costs | | 43.83 ISK |
| Truck (HGV) | | |
| Free travel time (X) | | 6,131 ISK |
| Congested travel time (1.4*X) | | 8,583 ISK |
| Driving costs | | 96.19 ISK |

*Table 3-16 Time values in ISK (2019 prices), see Appendix J. The congestion factor for Delivery Trucks and Trucks are derived from the Danish TERESA model*

### Other parameters or variables added

Besides the time and driving cost components, the model formulation includes some dummy variables:

Workplace density is the number of workplaces in a model zone relative to the total area of the zone. From the land use data, the square metre of the workplaces is available and from these, the number of workplaces is estimated from an assumption of average square metre per employed.

The average workplace square metres per employed are based on Swedish averages that are adapted to the seven workplace categories in the model:

- Shopping and service (high trip rates):64 m²
- Shopping and service (low trip rates): 77 m²
- Light industry: 40 m²
- Office and Schools: 33 m²

- Storage and heavy industry: 73 $m^2$
- Specialized (church, prison, cemetery): 83 $m^2$
- Buildings with very small trip rates: 42 $m^2$

Short time parking is a dummy variable that is included in the utility function for destination zones having paid parking areas. These influences the probability of having leisure and shopping activities to the specific zones.

ISK_NOK is a ratio value of Icelandic and Norwegian currency. The model parameters applied in the mode-destination model are based on Norwegian experiences, which is estimated relative to Norwegian Value of time and travel costs. The ISK_NOK ration is added to scale the unit prices to a level corresponding to Norwegian values. The factor is set to 14.

### 3.3.3 Final travel matrices

#### External zones

The transport demand model estimates traffic volumes to and from the internal model zones. The number of trips to and from the external zones are based on the relative activity level in each internal model zones and calibrated to fit traffic counts on roads to and from the model area.

#### Keflavik Airport

The trips to and from Keflavik airport are based on airport statistics from 2018, with an average of 8,175 passengers per day, and 22% domestic travel and 78% international travel. From a tourist travel survey completed in the airport, 50-60% of the quest use a rented car, private car or taxi to and from the airport and the remaining 40-50% use the regional busses or organised tour busses.

The travel statistics are used to divide the matrices into peak hour travel. It is presumed that travellers departing from Keflavik airport between 9 AM and 10 AM are travelling to the airport between 8 AM and 9 AM and that travellers arriving in Keflavik Airport between 7 AM and 8 AM are travelling from the airport between 8 AM and 9 AM.

| | To Keflavik Airport | From Keflavik Airport |
|---|---|---|
| AM | 3% | 14% |
| PM1 | 2% | 10% |
| PM2 | 2% | 19% |
| Off-peak | 93% | 57% |

*Table 3-17 Peak hour shares of travellers to and from Keflavik Airport*

Besides normal commute trips to and from Keflavik Airport, the total number aviation passengers are converted into car and bus trips.

### Pivot point

When applying the transport model for future prognoses, the estimated future trip matrices are pivot point corrected. When using a pivot point correction, the resulting trip matrices for the prognose years, are estimated as the relative changes between the estimated prognose year and the estimated base year (synthetic matrices $M_{m,i,j}^{Base}$ $and$ $M_{m,i,j}^{Prognose}$) relative to the observed matrices in the base year $B_{m,i,j}^{Base}$:

$$T_{m,i,j}^{prognose} = \frac{M_{m,i,j}^{prognose}}{M_{m,i,j}^{Base}} B_{ij}^{Base}$$

| | |
|---|---|
| $T_{m,i,j}^{prognose}$ | Final trip matrix for prognose model for mode $m$ between zone $i$ and $j$ |
| $M_{m,i,j}^{prognose}$ | Synthetic matrix for prognose model for mode $m$ between zone $i$ and $j$ |
| $M_{m,i,j}^{Base}$ | Synthetic matrix for base model for mode $m$ between zone $i$ and $j$ |
| $B_{ij}^{Base}$ | Observed matrix for base year for mode $m$ between zone $i$ and $j$ |

For zone pairs with 0 traffic or zone pairs with significant changes in traffic, the final trip matrices are estimated from the relation below. This results in 8 different solutions considered in the pivot point procedure listed in Table 3-18.

$$T_{m,i,j}^{prognose} = B_{m,i,j}^{Base} + \left(M_{m,i,j}^{prognose} - M_{m,i,j}^{Base}\right)$$

| Pivot point scheme restriction | | | | Pivot point prediction | |
|---|---|---|---|---|---|
| Type | $B_{m,i,j}^{Base}$ | $M_{m,i,j}^{Base}$ | $M_{m,i,j}^{prognose}$ | $T_{m,i,j}^{prognose}$ | |
| 1 | 0 | 0 | 0 | | 0 |
| 2 | 0 | 0 | >0 | | $M_{m,i,j}^{prognose}$ |
| 3 | 0 | >0 | 0 | | 0 |
| 4 | 0 | 0 | >0 | Normal growth | 0 |
| | | | | Extreme growth | $M_{m,i,j}^{prognose} - M_{m,i,j}^{\text{Base}}$ |
| 5 | >0 | 0 | 0 | | $B_{m,i,j}^{\text{Base}}$ |
| 6 | >0 | 0 | >0 | | $B_{m,i,j}^{\text{Base}} + M_{m,i,j}^{prognose}$ |
| 7 | >0 | >0 | 0 | | 0 |
| 8 | >0 | >0 | >0 | Normal growth | $\frac{M_{m,i,j}^{prognose}}{M_{m,i,j}^{\text{Base}}} B_{m,i,j}^{\text{Base}}$ |
| | | | | Extreme growth | $\frac{B_{m,i,j}^{\text{Base}} \cdot X}{M_{m,i,j}^{\text{Base}}} + \left(M_{m,i,j}^{prognose} - X\right)$ |

*Table 3-18 Pivot pointing scheme*

For type 4 (having 0 trips in the observed and modelled base matrix cell), the extreme growth case is when the modelled prognose matrix is larger than the modelled base matrix:

$$M_{m,i,j}^{prognose} > M_{m,i,j}^{Base}$$

For type 8 (having trips in the observed and both modelled matrices), the extreme growth case is when the modelled prognose matrix is larger than $X$:

$$M_{m,i,j}^{prognose} > X \ og \ X = M_{m,i,j}^{Base} \cdot \left[0{,}5 + 5 \cdot max\left(\frac{M_{m,i,j}^{Base}}{B_{m,i,j}^{Base}}; 0{,}1\right)\right]$$

The pivot point correction is completed for all transport modes separately. The outcome matrix $T_{m,i,j}^{prognose}$ is the final internal trip matrices for each single transport mode based on the demand model. The Internal matrices are summarized with the external matrices and applied in the route choice model.

The external matrices for the prognose year are estimated from general growth factors based on land use data.

### 3.3.4 Route choice model

The demand model estimates matrices for car, car passengers, bike, other modes and public transport. The car, bike and public transport are distributed to the road network in the route choice model.

### Car, Delivery Trucks and Trucks

The route choice model is completed in two steps. Firstly, the model estimates the capacity of intersection using ICA assignments and secondly an equilibrium assignment (Bi-conjugate Frank-Wolfe) distributes the traffic to the most optimal route in the network. The traffic assignment procedure includes capacity restrictions on roads and in intersections.

The utility function of the routes is estimated as a weighted travel cost based on travel time, travel distance and out-of-pocket costs from road toll:

$$V_{ij}^{Car} = 100 \cdot TT_{m,ij} + 9.24 \cdot Dist_{m,ij} + 174.09 \cdot OOP_{m,ij}$$

| | |
|---|---|
| $V_{m,ij}$ | Impedance of mode $m$ between zone $i$ and zone $j$ |
| $VoT_m$ | Value of time for mode $m$ |
| $TT_{m,ij}$ | Travel time with mode $m$ between zone $i$ and zone $j$ |
| $DC_m$ | Driving costs for mode $m$ |
| $Dist_{m,ij}$ | Travel distance with mode $m$ between zone $i$ and zone $j$ |
| $Toll_m$ | Toll costs for mode $m$ |
| $OOP_{m,ij}$ | Out Of Pocket costs with mode $m$ between zone $i$ and zone $j$ |

The model parameters are listed in Table 3-19. Travel times are the modelled travel times, i.e. travel times including delays based on volume delay functions for the different link types, depending on road capacities and travel flows, see section 3.2.2.

| Mode | Unit prices | | | | | Impedance model parameters | | |
|---|---|---|---|---|---|---|---|---|
| | VoT (ISK/h) | VoT (ISK/sec) | Driving cost (ISK/km) | Driving cost (ISK/m) | OOP | $VoT_m$ | $DC_m$ | $Toll_m$ |
| Car | 2068 | 0.5744 | 53.092 | 0.05309 | 1 | 100 | 9.24 | 174.09 |
| Bike | 2068 | 0.5744 | - | - | 0 | 100 | 0.00 | 0.00 |
| Other Modes | 2068 | 0.5744 | - | - | 0 | 100 | 0.00 | 0.00 |
| DT | 4974 | 1.3817 | 43.83 | 0.04383 | 1 | 100 | 3.17 | 72.37 |
| HGV | 6131 | 1.7031 | 96.19 | 0.09319 | 1 | 100 | 5.47 | 58.72 |

*Table 3-19 Unit prices and corresponding route choice impedance parameters*

### Bike

The road impedance for bike is similar for cars, but the driving costs and potential tool costs are 0 and the route choice for bikes depend on travel times alone, see Table 3-19.

### Public Transport

The route choices for public transport is a summary of different time components describing the perceived travel time from accessing the road network to arriving at the destination zone.

The route choice of public transport does not include the driving costs as the public transport system has equal cost no matter which route is chosen. However, number of transfers between bus lines influence the route choice:

$$V_{PT,ij} = 1 \cdot Tt_{PT,i,j}^{InVehicleTime} + 1.5 \cdot \left(Tt_{PT,i,j}^{Access} + Tt_{PT,i,j}^{Egress} + Tt_{CP}^{walk} + Tt_{PT,i,j}^{Transfer}\right) + 0.8 \cdot Tt_{PT,i,j}^{OriginWait} + 6 \cdot N_{PT,i,j}^{Transfer}$$

| | |
|---|---|
| $V_{PT,ij}$ | Impedance of public transport between zone $i$ and zone $j$ |
| $Tt_{PT,i,j}^{tt}$ | Travel time components between zone $i$ and zone $j$ |
| $N_{PT,i,j}^{Transfer}$ | Number of transfers between bus line routes from zone $i$ to zone $j$ |

### 3.3.5 Scenario settings

Most model parameters are fixed in the base scenario and the different forecast scenarios. For prognose years, zone data and model network might vary, but most other parameters are fixed. The model does however contain global parameters possible to change in order to evaluate different development trends.

Significant changes in economy, could potentially influence the value of time and driving costs. The unit prices are traditionally fixed but could be updated if e.g. evaluating changes in travel costs, that could be the result of e.g. increased fuel prices or increased taxes. The unit prices are implemented as network attributes and are possible to update from network settings. The base values included in the model is listed in Table 3-16 in section 3.3.2.

Other factors that could be relevant to update for different forecast analyses are also defined as universal network attributes, that are possible to adjust for different development scenarios. This could be e.g. the impacts of increased freight travel by increasing the share of delivery trucks or trucks. Another base setting could be updating the unit price of Public transport to evaluate the impacts of ticket prices. The network attributes that could be adjusted for different scenario tests are listed in Table 3-20.

| Name | Description |
|---|---|
| DT Share | The number of trips in the delivery truck matrix is set to be 8% of the car matrix in the base year |
| HGV Share | The number of trips in the truck matrix is set to be 4% of the car matrix in the base year |
| Price_VoT | The unit value of time price for persons is 2068 ISK |
| Price_VoT_DeliveryTrucks | The unit value of time price for delivery trucks is 4974 ISK |
| Price_VoT_HGV | The unit value of time price for trucks is 6131 ISK |
| Price_PuT | The unit price for public transport is 470 ISK |
| Price_KM_Car | Driving costs for car is 53.09 |
| Price_KM_Car_Business | Driving costs for business travel by car is 43.00 |
| Price_KM_DeliveryTrucks | Driving costs for delivery trucks is 43.83 |
| Price_KM_HGV | Driving costs for trucks is 96.19 |
| Factor_AveragePersons_Car | The average number of persons per car is 1.18 |

*Table 3-20 Universal network attributes possible to adjust for scenario analyses*

## 3.4 Model calculation procedure

The overall model procedure is illustrated in Figure 3-7.

The first section prepares the base settings and base data for the selected scenario. The base data are applied in an initial solution that describes the generalised cost of the base network, i.e. the average travel times, travel distances and travel costs between all zone pairs for Private transport, Bike and Public transport. The estimations include ICA, that determines the capacity and travel times in the ICA nodes (signalised intersections and large two-way stop nodes).

The generalised cost works as input to the Mode-destination calculations. The final travel matrices for Private transport, Bike and Public transport are found as an iterative process including the impact of congestion in the final mode and destination distribution. For each Mode-destination step, the matrices are pivot point corrected.

When the Mode-destination procedure converges, the travel matrices are distributed to the three model network systems.

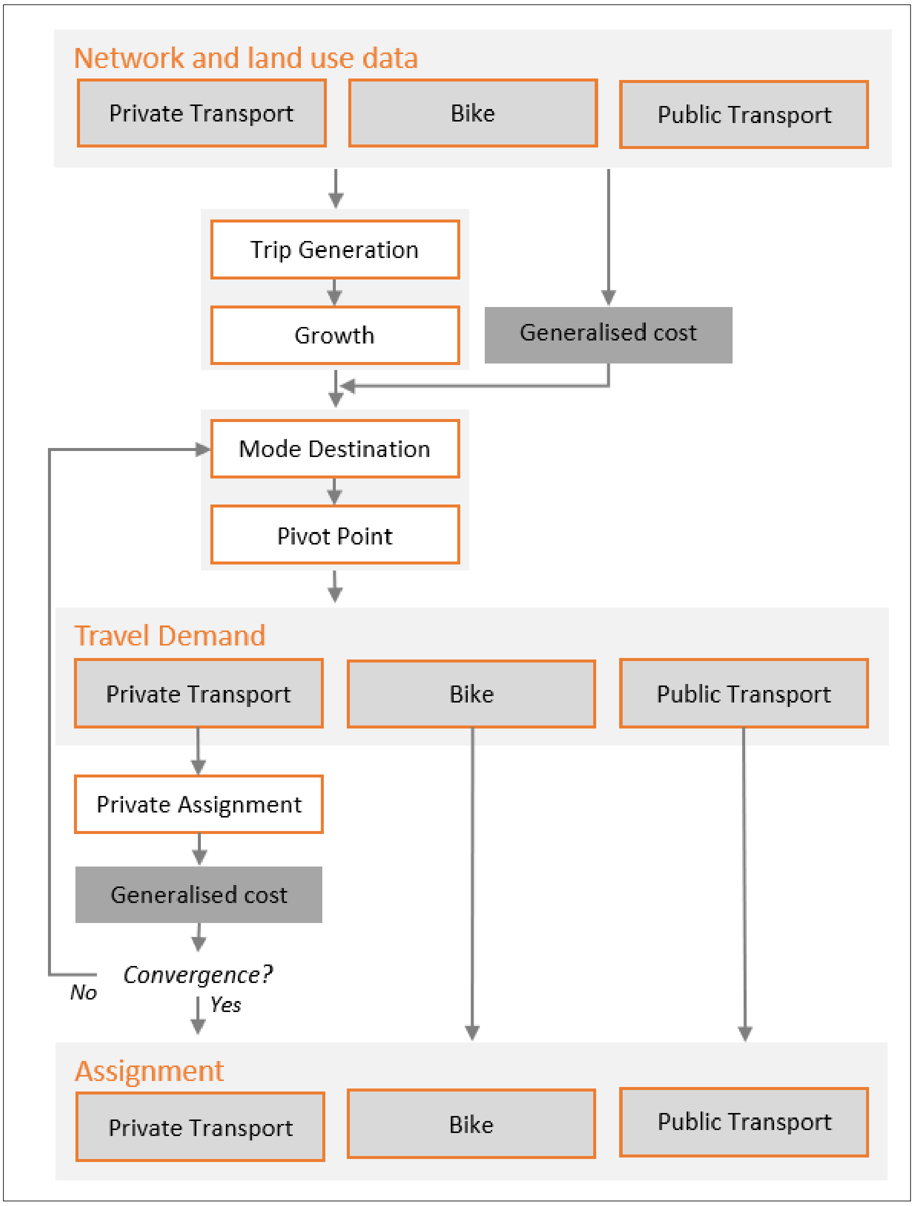



*Figure 3-7 Overall model calculation procedure*

# 4 Climate module

The emissions and energy consumption are an important indicator for reaching the goals of sustainable transport.

The transport model provides the possibility to be able to evaluate the transport related emissions and energy consumption at street level and at a more aggregated level in relation to greenhouse gasses for the capital area.

With the principal approach from TEMA2010 the environmental module will be able to calculate the total amount of $CO_2$, CO, HC, $NO_X$, $SO_2$, particles and energy consumption from the traffic inside the model area.

The $NO_X$ and particle emissions are the most essential indicators of the traffics contribution to air pollution at street level. Due to this, the emissions of $NO_X$ and particles should be possible to evaluate at street level.

From the TEMA2010 model (From the Danish Ministry of Transport), it is possible to estimate emissions and energy consumption from different transport modes. In the model, the cars and delivery trucks are categorized relative to engine size, EURO norm and fuel type. Heavy vehicles are categorized relative to type (trucks/busses), EURO norm and weight class. It is possible to change and adjust the implemented model parameters in the strategic environmental impact module, either from changes in the vehicle fleet defined in the model or from defining prognose years.

## 4.1 Data

The input data for calculation of emissions and energy consumption are possible to grouped into parameters transferred from the transport model and the parameters in the TEMA2010 system:

- Data from the transport model:
  - Heat emissions (per link): Length (m), Speed (km/h), Traffic volumes for car, delivery trucks, trucks and busses (ADT)
  - Cold emissions[6] (OD relations): From zone $i$, to zone $j$, travel distance (m), car (ADT)
- Parameters from the TEMA 2010 system:
  - Engine sizes, EURO norms, fuel types, weight classes etc. for the different prognose years 2024, 2029 and 2034. For long term

[6] The extent of cold driving/emissions is based on the assumption that the first 10 kilometers of a car trip should have a cold start/engine penalty to the total emissions. This is only included for cars as the majority of the trips completed by other vehicles are assumed to be heat trips.

prognoses (after highest EURO 6 norm), yearly reductions in emissions and energy consumption will be applied.

The calculations furthermore include the share of different vehicle types (hybrid- and electric vehicles or biogas trucks and busses).

## 4.2 Approach

In TEMA2010, the emissions and energy consumption are estimated from travelled distances multiplied with average emission factors and energy consumptions per kilometre. The estimation of average factors considers types like:

- Fuel type
- Engine size
- Travel distance (OD relation)
- Persons per car
- Travel speed
- Cold start/cold engine

## 4.3 Results

The outcome of the emission module is a summary table with total emissions inside the model area and for each defined sub-area (if that is included).

When calculating the emissions, the simplifications from the transport model influences the uncertainties related to the estimated emissions. The model system does not include all living streets and the emissions from these local roads are consequently not included in the total emissions. When however, comparing two model scenarios, the uncertainties related to this simplification is minimal.

It is recommended to apply the results for scenario comparisons. But, if presenting the results from one single scenario, the figures should be corrected for the roads not included in the model. These small roads do not influence the overall traffic flows but does contribute with significant emissions.

The correction depends on the lengths and average traffic volumes of the roads not included in the transport model.

$NO_X$ is the sum of the nitrogen oxides NO and $NO_2$. Car exhaust contain a mix of both NO and $NO_2$. It is primary NO, but also a few percentage $NO_2$.

According to TEMA2010, the strategic environmental emission module only estimates the $NO_X$ and it is not possible to outline the NO and $NO_2$ separately. The particle estimations are neither grouped into different particle types and sizes. The model results are link based emissions based on traffic volumes whereas the emission threshold values also depend on the surroundings ($m^3$). If validating differences between model scenarios, the model results are the change in $NO_X$ emissions and particles caused by the relative change in traffic.

# 5 Model results: Base year model

The overall mode shares calculated in the demand model procedure is calibrated to the mode share distribution registered in the travel survey as listed in Table 12-5 in Appendix A.3.

To ensure reasonable estimation of route choices, the base year matrices are distributed to the model network, and the assigned traffic volumes are compared to traffic counts. The model network is adjusted to reach reasonable model accuracy with less than 10% deviation from traffic counts.

## 5.1 Mode shares

In Table 5-1, the calculated mode shares from the demand model are listed together with the shares registered from the travel survey. The difference observed for bike trips are likely to be related to a considerable share of short distance bike trips, that are often zone internal trips.

| | Travel Survey | | Demand model |
|---|---|---|---|
| Transport Mode | Share of trips | Share of trips excl. Walk | Estimated share of trips |
| Bike | 6.2% | 7.1% | 5.8% |
| Car Driver | 61.6% | 70.6% | 71.3% |
| Car Passenger | 15.1% | 17.4% | 17.6% |
| Other | 0.3% | 0.3% | 0.2% |
| Public Transport | 4.0% | 4.6% | 5.2% |
| Walk | 12.8% | - | - |
| Total | 100.0% | 100.0% | 100% |

*Table 5-1 Mode shares registered in the travel survey with and without walk trips together with the estimated modes shares from the demand model.*

## 5.2 Key figures

The final matrices applied for the base year model are summarised in Table 5-2. The total traffic volumes include the traffic volumes from the demand model together with external trips and tourism trips.

| Mode | Total traffic |
|---|---|
| Car | 1,061,600 |
| Public Transport | 35,000 |
| Bike | 59,000 |
| **Total** | **1,155,600** |
| Delivery Trucks | 96,100 |
| Trucks | 48,200 |

*Table 5-2 Total traffic in base year*

## 5.3 Private transport

The private transport volumes are calibrated to fit traffic counts. Figure 5-1 illustrates the location of the traffic counts applied for calibration of annual average weekday traffic (AAWT). Most focus is put on the newest traffic counts, but generally the traffic modelled volumes are within 10% of the traffic counts.

The traffic counts are both counts at link level and turn movement counts in six intersections. Figure 5-2 illustrates the location of peak hour counts. More turn movement counts in intersections are available for the peak hours.


*Figure 5-1 Count locations applied for AAWT count locations*

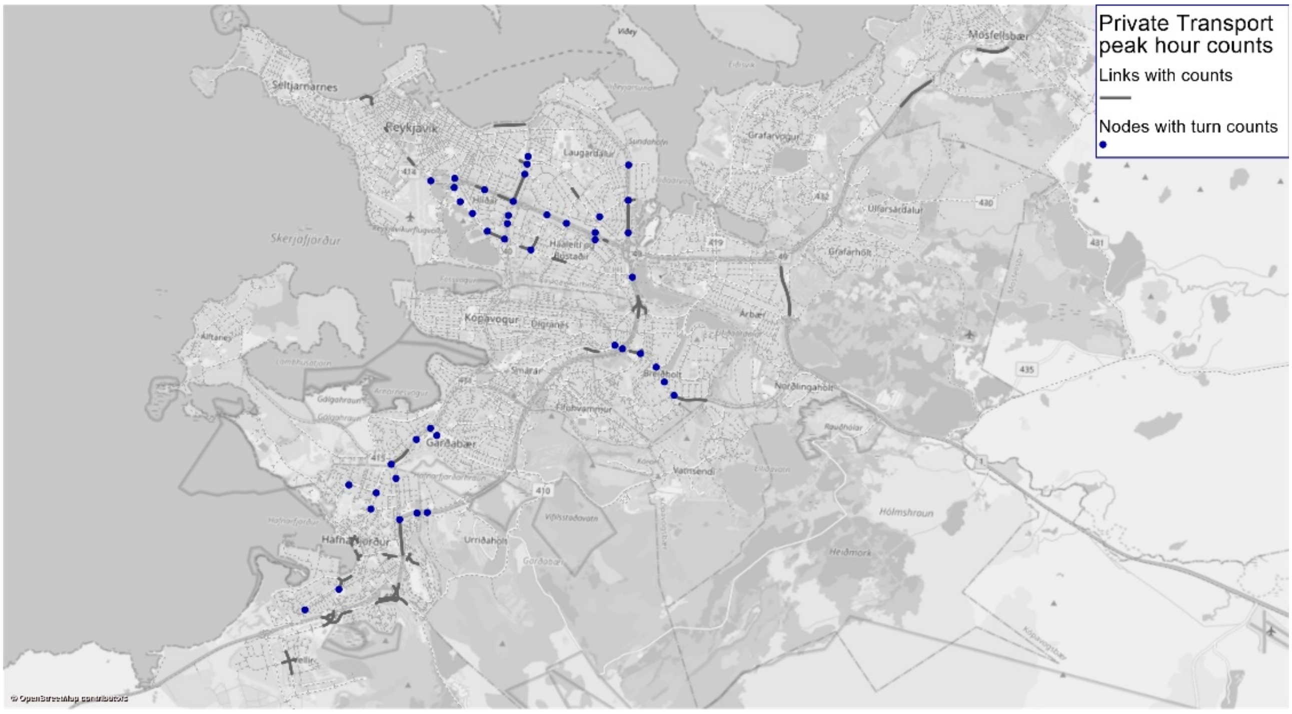



*Figure 5-2 Peak hour counts locations used for model calibration*

The distribution of cars, delivery trucks and trucks per day on the road network are illustrated in Figure 5-3 to Figure 5-7.

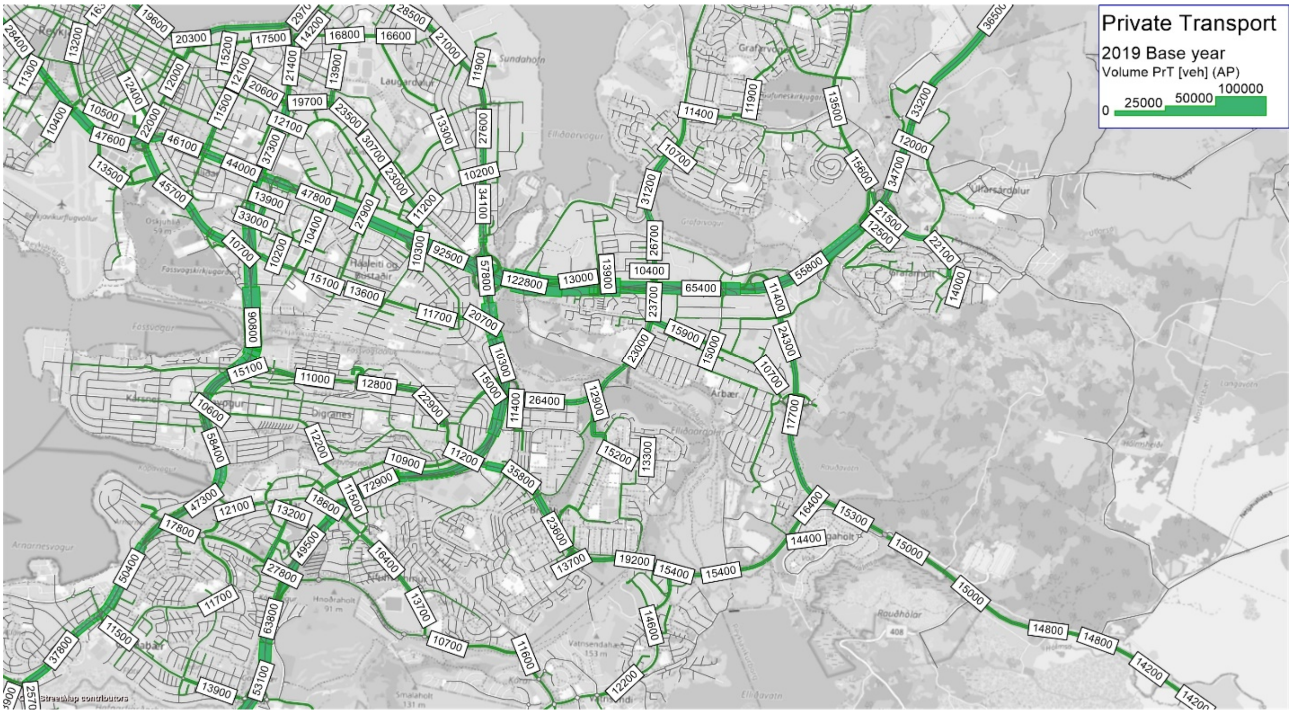



*Figure 5-3 Traffic volumes Base year 2019 (AAWT) – Overview*

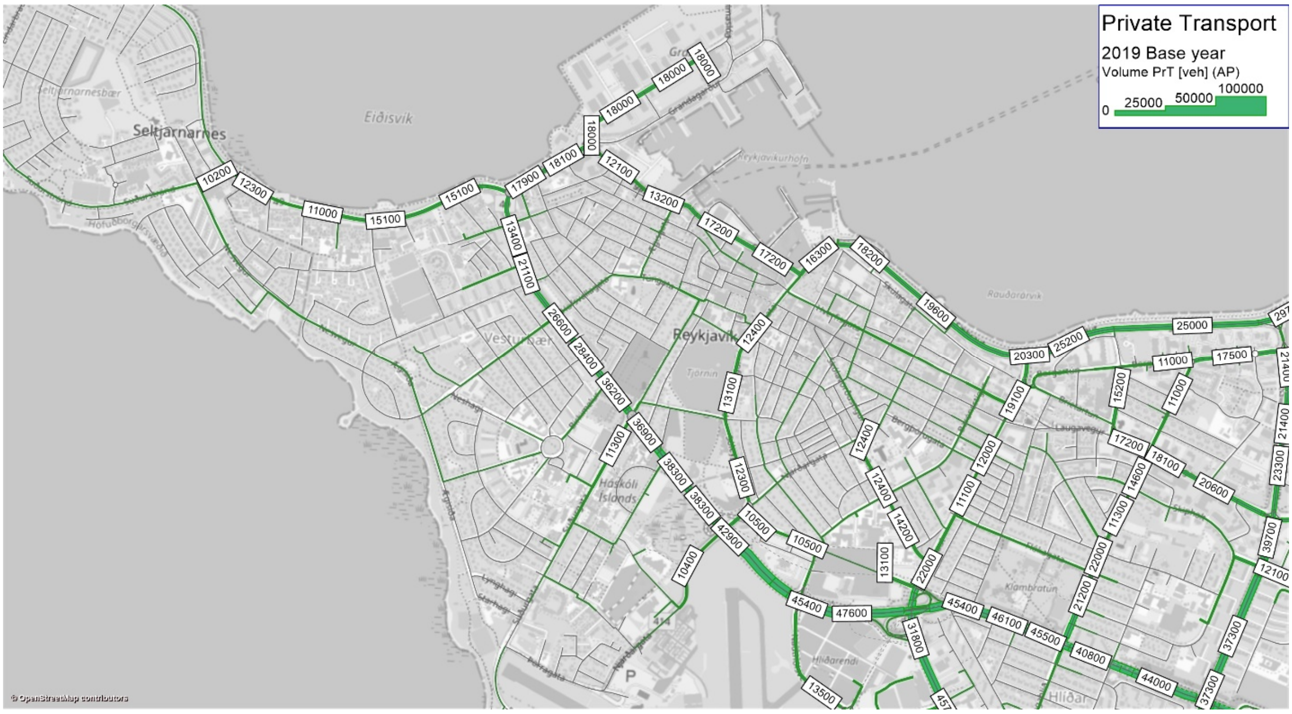



Figure 5-4 Traffic volumes Base year 2019 (AAWT) (local zoom – city)


Figure 5-5 Traffic volumes Base year 2019 (AAWT) (local zoom – middle)

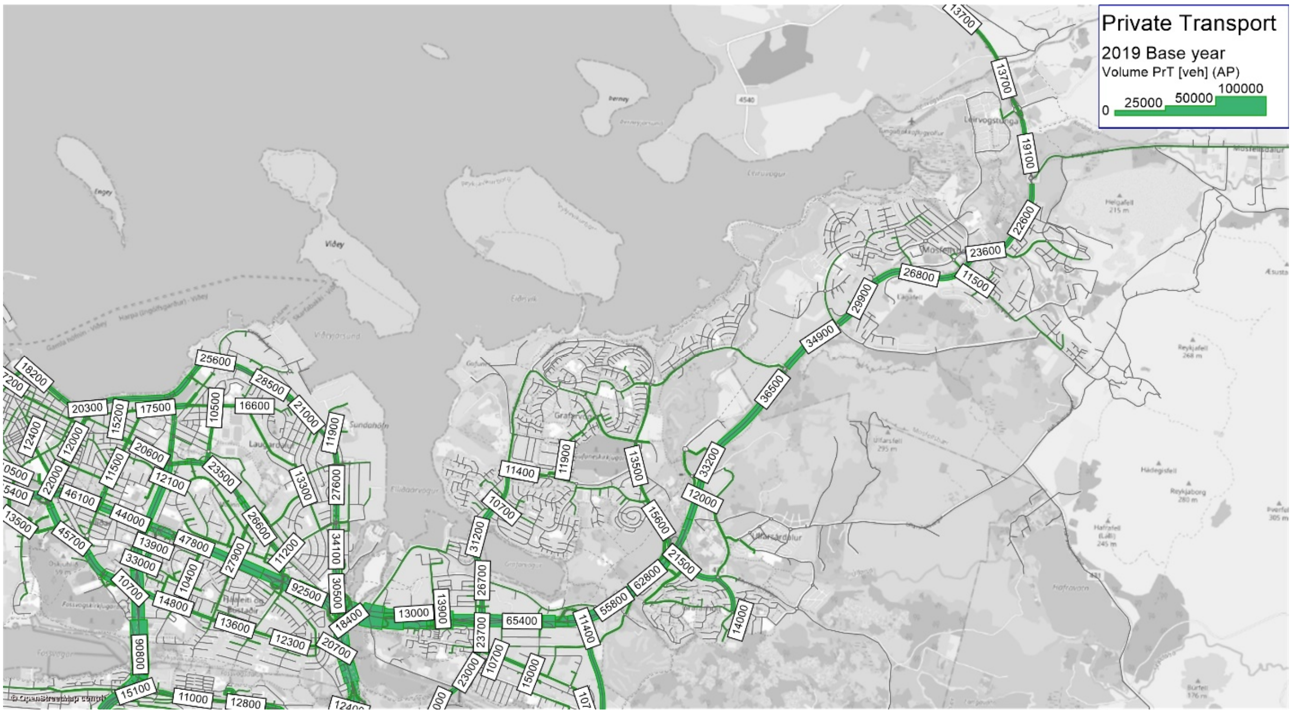



*Figure 5-6 Traffic volumes Base year 2019 (AAWT) (local zoom – north)*

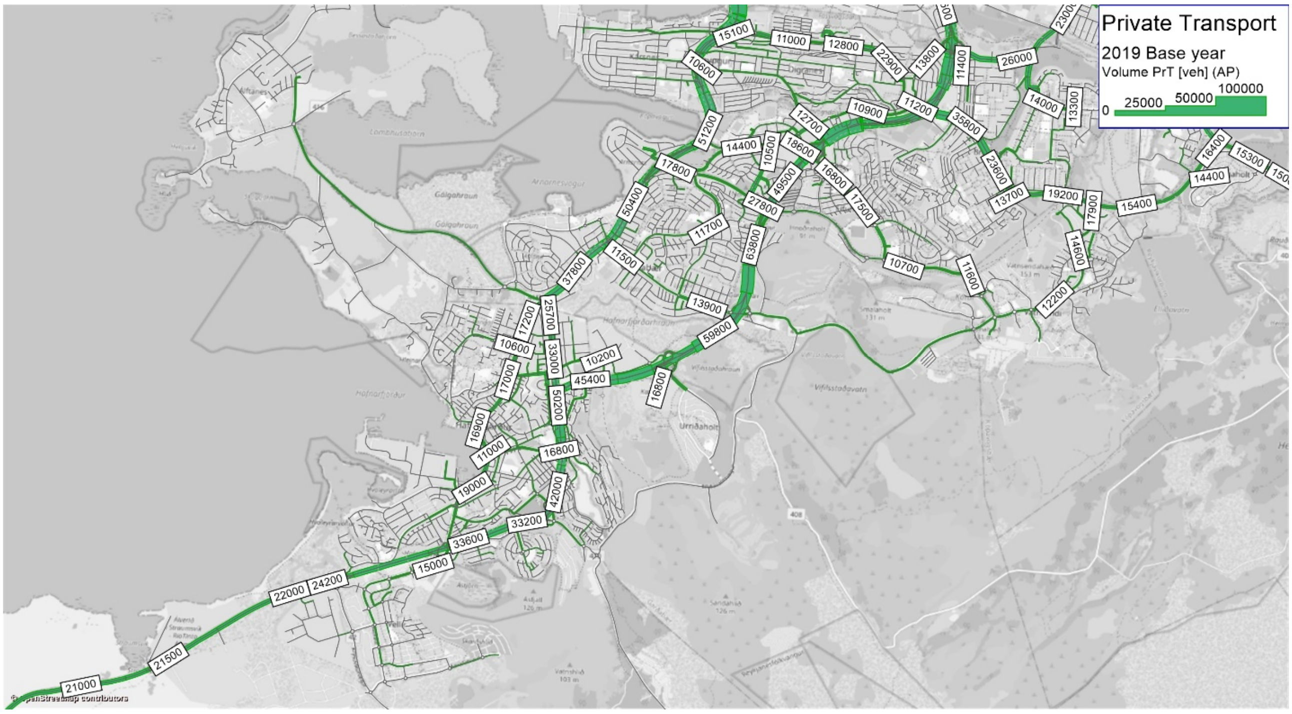



*Figure 5-7 Traffic volumes Base year 2019 (AAWT) (local zoom – south)*

## 5.3.1 Peak hour traffic

The distribution of cars, delivery trucks and trucks in the peak hours on the road network are illustrated in Figure 5-8 to Figure 5-10.

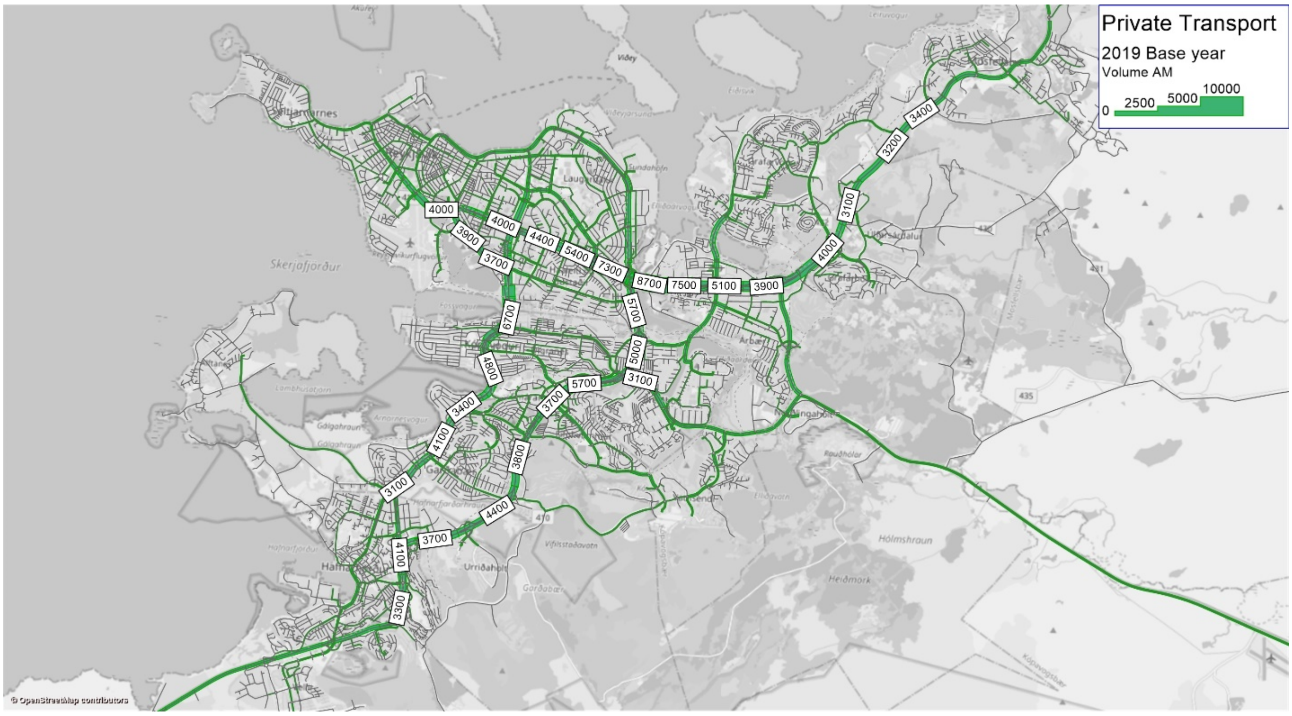



*Figure 5-8 Morning peak hour traffic volumes (AM). Base year 2019 (overview)*

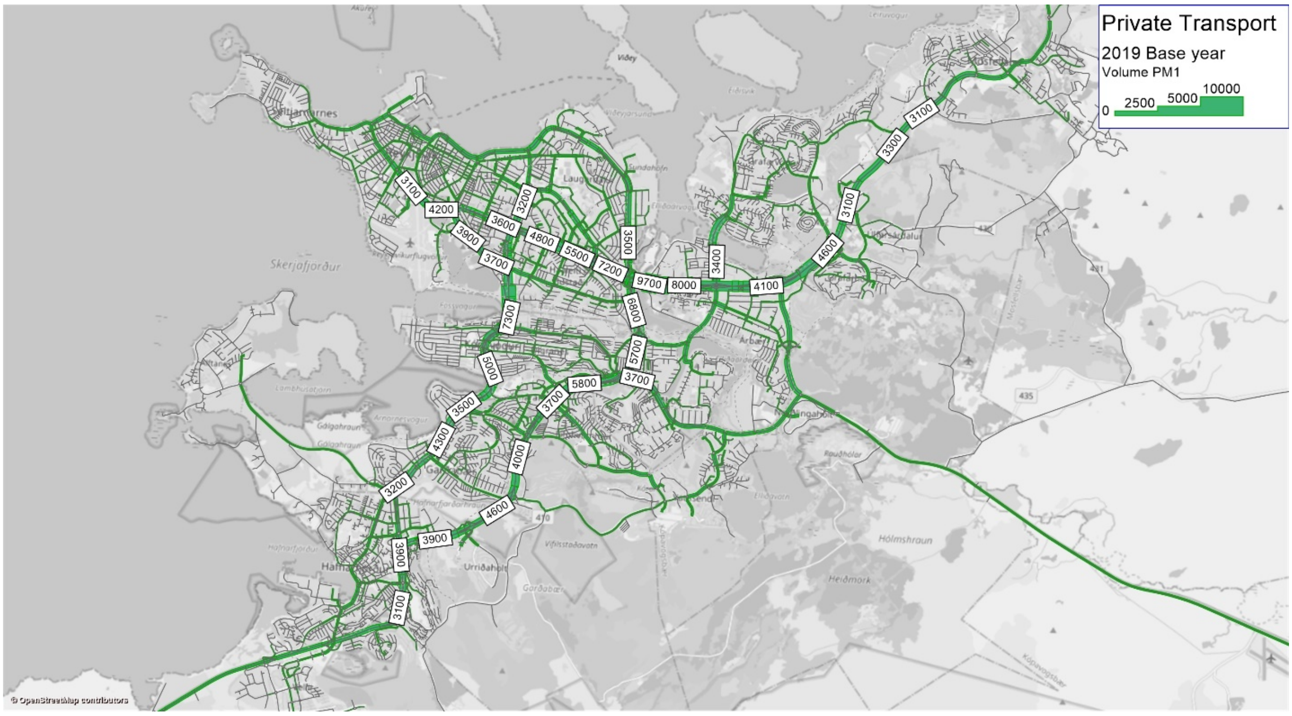



*Figure 5-9 First afternoon peak hour traffic volumes (PM1). Base year 2019 (overview)*

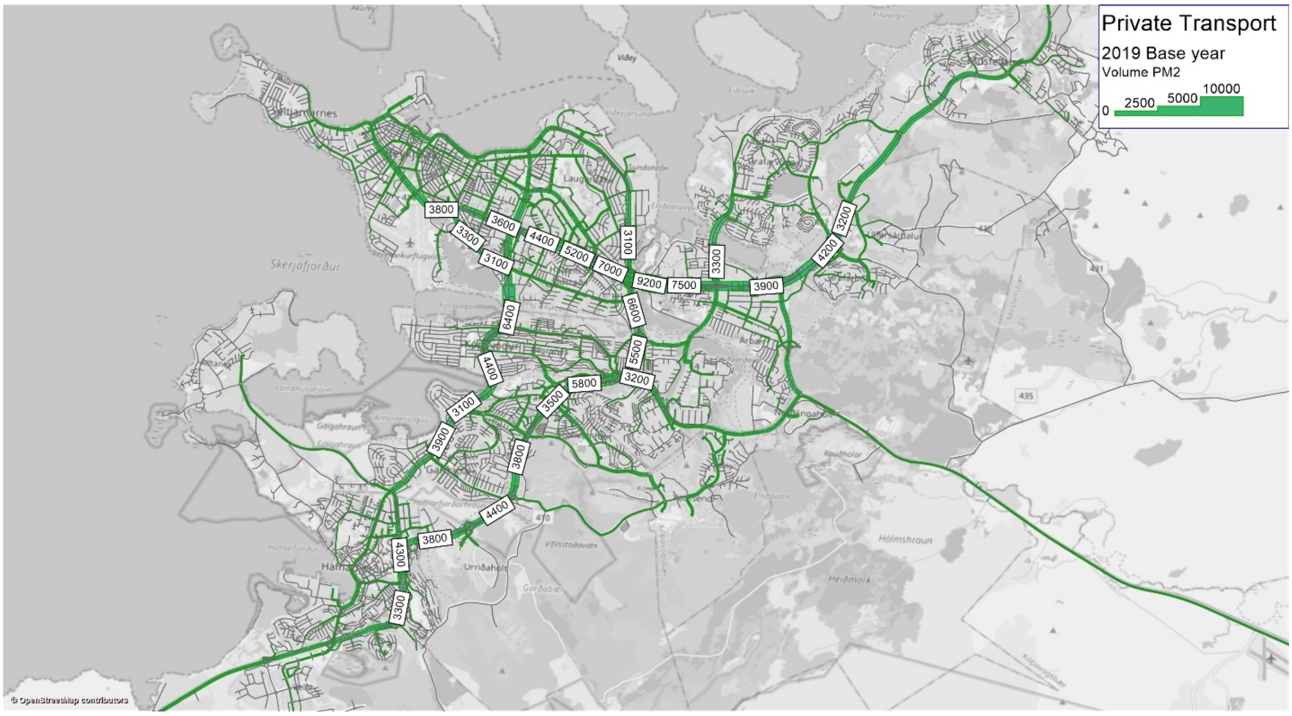



*Figure 5-10 Second afternoon peak hour traffic volumes (PM2). Base year 2019 (overview)*

## 5.4 Public transport

The public transport flows are calibrated from passenger counts at bus stops. The traffic counts are for passengers boarding and alighting for each bus line at each bus stop. The model is not calibrated to fit the passengers at each bus line, but summarised for each stop, i.e. for parallel bus lines, the passengers might be distributed differently than observed from the traffic counts. At an aggregated level, the modelled number of passengers boarding and alighting the busses are within a 5% margin of the traffic counts.

After calibrating the public transport model at bus stops, the passengers in each bus line was compared with a March 2019 passenger count from Strætó. The overall passenger flows matched the passenger counts with less than 5% deviation and the highest deviation was found for bus lines with parallel line routes.

The estimated passenger volumes are illustrated from Figure 5-11 to Figure 5-15.

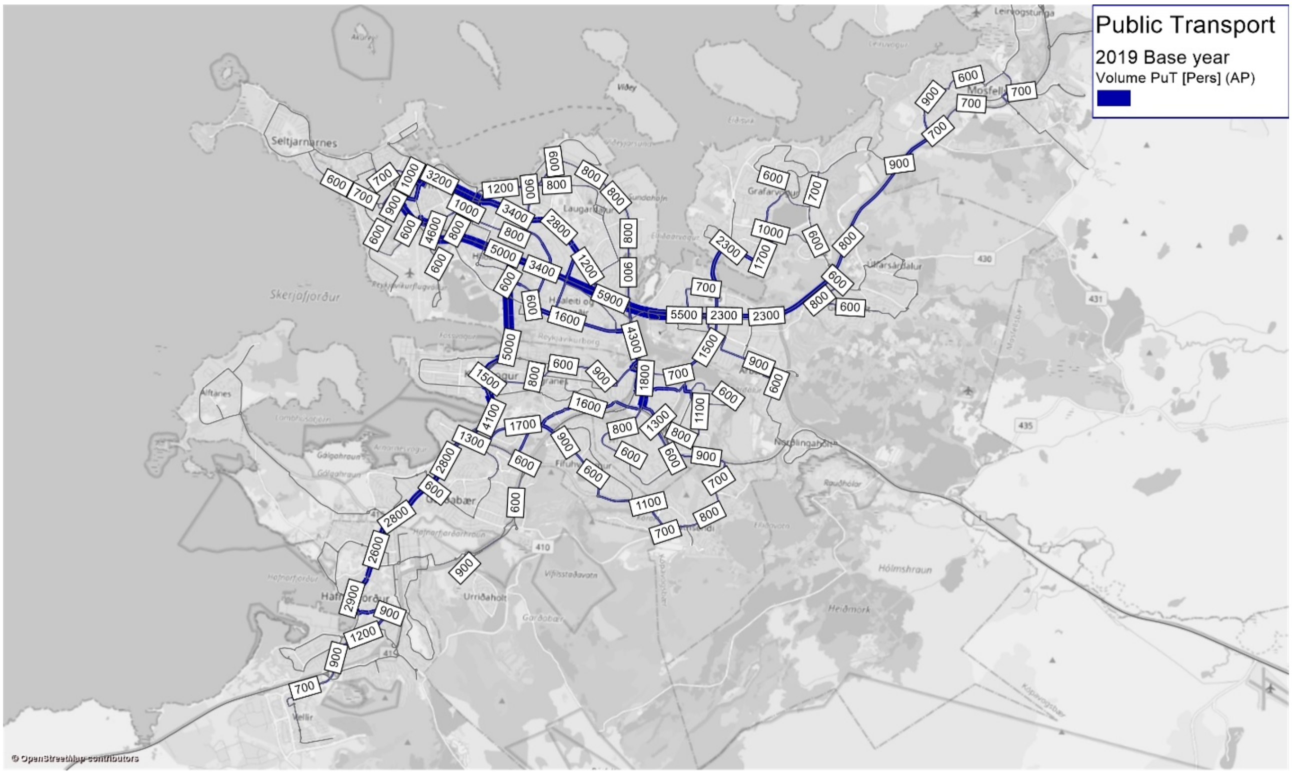



*Figure 5-11 Public Transport passengers in Base year 2019 (AAWT) – Overview*


*Figure 5-12 Public Transport passengers in Base year 2019 (AAWT) (local zoom – city)*

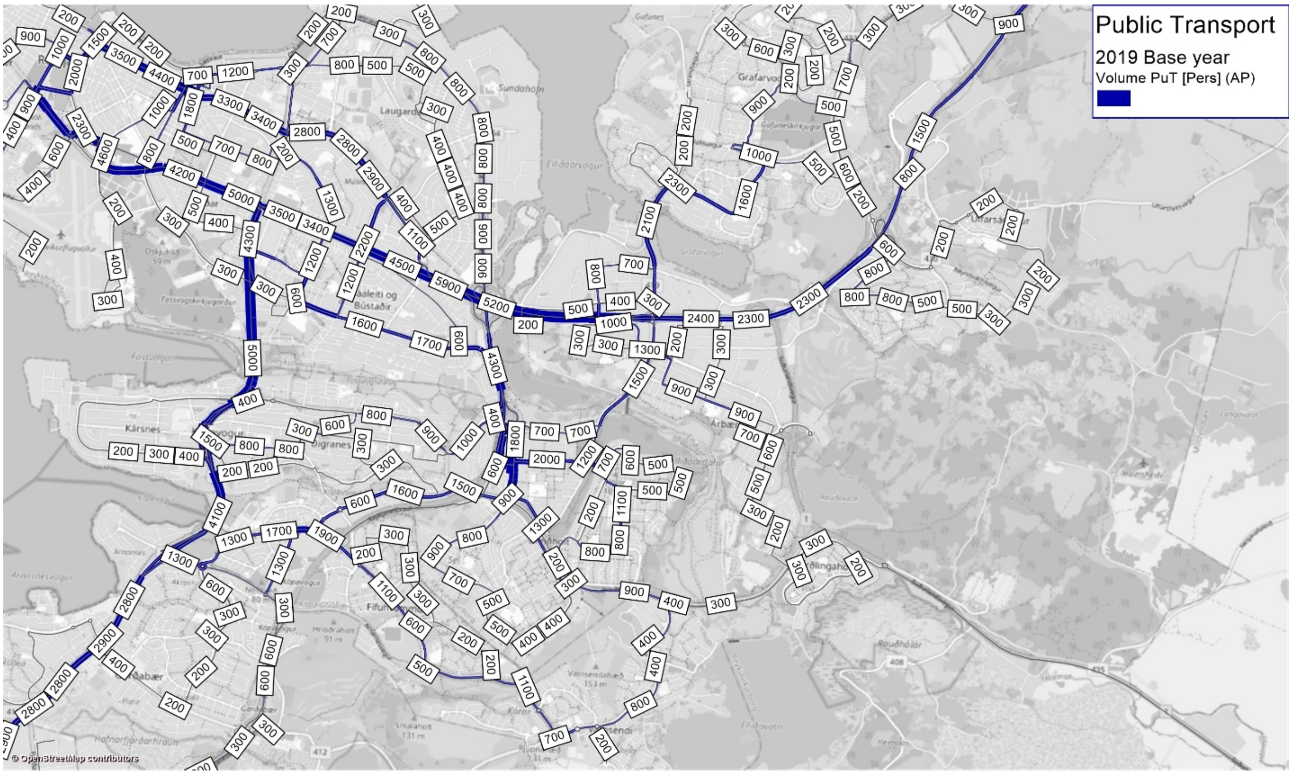



*Figure 5-13 Public Transport passengers Base year 2019 (AAWT) (local zoom – middle)*


*Figure 5-14 Public Transport passengers Base year 2019 (AAWT) (local zoom – north)*

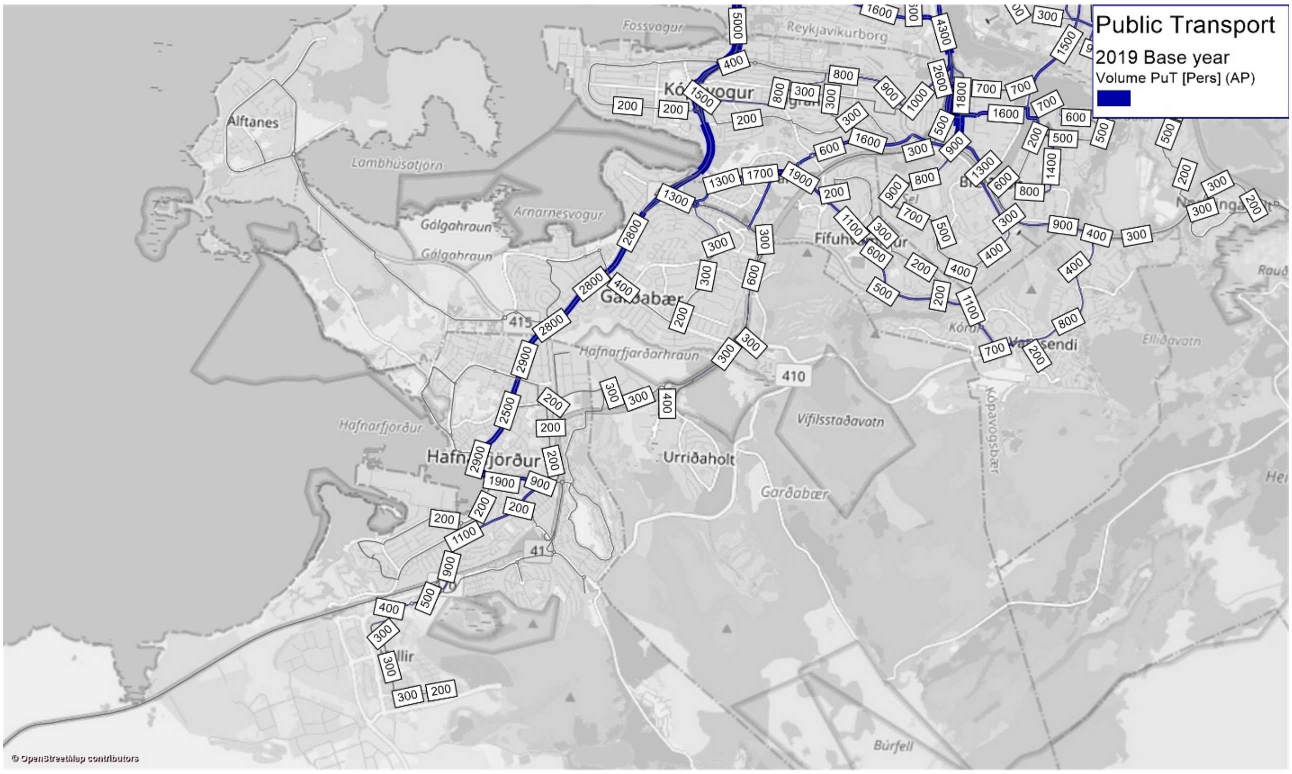



*Figure 5-15 Public Transport passengers Base year 2019 (AAWT) (local zoom – south)*

## 5.5 Bike

The distribution of bike traffic is calibrated to match bike counts. The location of the bike counts is illustrated in Figure 5-16. As illustrated in Figure 5-16, the counts are located at main bike baths and the bike model are consequently not calibrated to fit local short distance trips. As for the other modes, bike traffic is calibrated to fit traffic counts within 10% variation. The estimated bike volumes are illustrated from Figure 5-17 to Figure 5-21.


*Figure 5-16 Bike count locations*


*Figure 5-17 Bike volumes Base year 2019 (AAWT) – Overview*


*Figure 5-18 Bike volumes Base year 2019 (AAWT) (local zoom – city)*

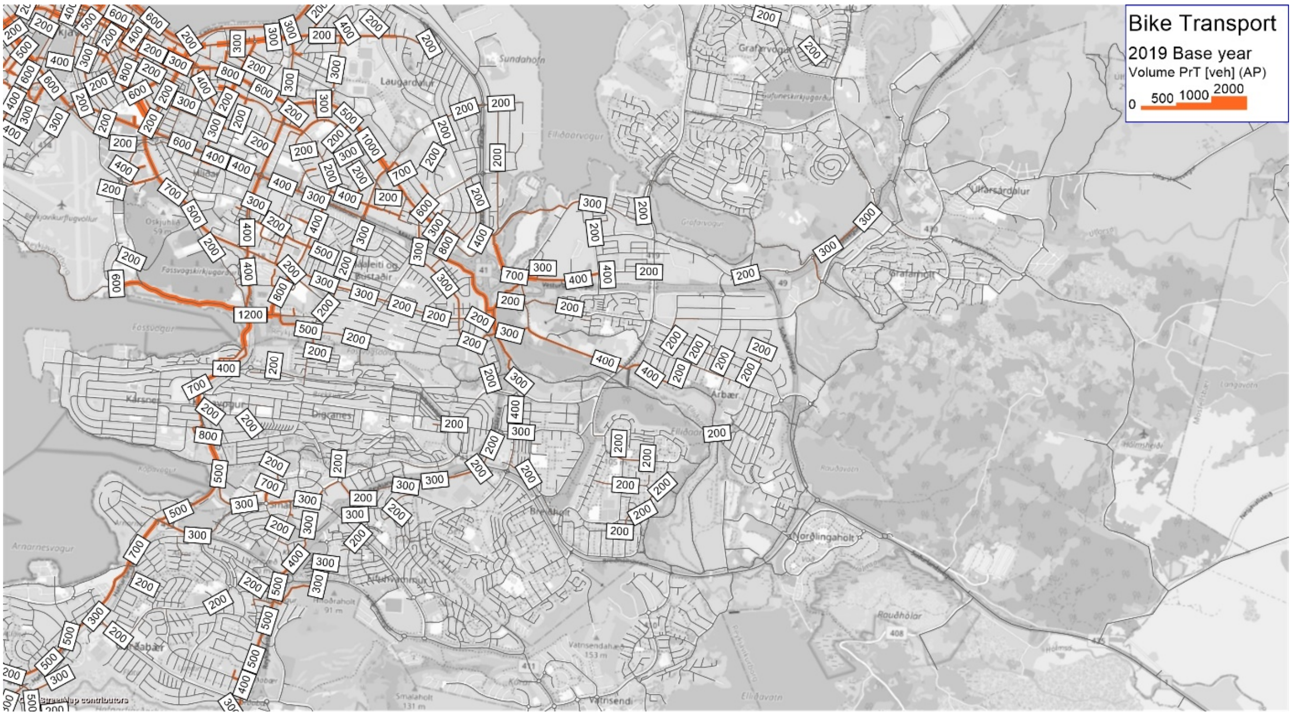



*Figure 5-19 Bike volumes Base year 2019 (AAWT) (local zoom – middle)*


*Figure 5-20 Bike volumes Base year 2019 (AAWT) (local zoom – north)*


*Figure 5-21 Bike volumes Base year 2019 (AAWT) (local zoom – south)*

# 6 Forecasts

Forecasts included in SLH are based on the transport plan for the capital area (Samgöngusáttmáli höfuðborgarsvæðisinns). The transport plan is divided into 3 construction phases where the first phase is planned to be finished in 2024, the second in 2029 and the third phase is planned to be finished in 2034. In the traffic model these phases will be referred to as follows.

- **Forecast 0** (0-incident scenario 2019-2024)
- **Forecast 1** (construction phase 2019-2024)
- **Forecast 2** (construction phase 2025-2029)
- **Forecast 3** (construction phase 2029-2034)

Changes in land use, population, employment etc are based on analysis done by the Icelandic housing financing fund (Íbúðalánasjóður) on population forecast data from Statistics Iceland (Hagstofan).

## General growth

Beside the growth for both the passenger and freight transport, which are based on the changes in land use and population, a general growth is also added in the forecast calculations. The yearly growth factors for the general growth is shown in Table 6-1.

| Yearly growth factors | Passenger trips | | Freight trips | |
|---|---|---|---|---|
| Period | Internal zones | External zones | Internal zones | External zones |
| 2019-2024 | 0,5% | 0,5% | 0,5% | 0,5% |
| 2024-2029 | 0,5% | 0,5% | 0,5% | 0,5% |
| 2029-2034 | 0,5% | 0,5% | 0,5% | 0,5% |

*Table 6-1 Yearly general growth*

## Keflavik Airport

The forecast calculations include an expected growth of tourists using Keflavik Airport. The growth is based on the expected future passengers using the airport. The assumed growth of tourists in Keflavik Airport used in the transport model is shown in Table 6-2.

| Forecast year | Growth from year 2019 |
|---|---|
| 2024 | 18% |
| 2029 | 36% |
| 2034 | 42% |

*Table 6-2 Assumed growth of tourists in Keflavik Airport*

# 7 Forecast 0

Forecast 0 is the 0-incident scenario. This scenario has the same land use changes as in Forecast 1. In this scenario only projects that has started construction (2020) or are about to start are included. The main purpose for this scenario is to be able to filter effects of traffic changes due to infrastructure adjustments from general traffic growth due to changes in land use.

The total changes in land use data for forecast 0 compared to the base year are shown in Table 7-1. Changes for individual zones are shown in Appendix G. Changes in land use, population, employment etc are based on analysis done by the Icelandic housing financing fund (Íbúðalánasjóður) on population forecast data from Statistics Iceland (Hagstofan).

| Category | Land use change 2024 |
|---|---|
| Population (number of dwelling units) | |
| Single family houses | 1214 |
| Multi family apartments | 9008 |
| Land use (m²) | |
| Category 1) Shopping and service (high trip rates) | -1650* |
| Category 2) Shopping and service (low trip rates) | 19831 |
| Category 3) Light industry | 4800 |
| Category 4) Office and Schools | 44400 |
| Category 5) Storage and heavy industry | 9300 |
| Category 6) Specialized (church, prison, cemetery) | 0 |
| Category 7) Buildings with very small trip rates | 0 |

*Table 7-1 Total changes in land use data in 2024 compared to the base year.*

**) Negative values indicate changes in other land use categories*

New projects included in forecast 0 are listed below and illustrated in Figure 7-1.

1) Reykjanesbraut: Kaldárselsvegur – Krísuvíkurvegur (Upgraded to 2+2 lane, 70km/h road)
2) Arnarnesvegur: Rjúpnavegur – Breiðholtsbraut (new 1+1 lane, 50km/h road)
3) Suðurlandsvegur: Bæjarháls – Vesturlandsvegur (Upgraded to 2+2 lane 80km/h road)
4) Vesturlandsvegur: Skarhólabraut – Hafravatnsvegur (Upgraded to 2+2 lane, 80km/h road)


*Figure 7-1 infrastructure projects included in Forecast 0*

Additionally, to these projects “Laugavegurinn” has been closed for cars and Burknagata (hospital area) has been opened for traffic.

Changes to public transport are minor in Forecast 0 compared to the 2019 bus system. Small rerouting was made on line 18 and line 5 was split into line 5 and line 8.

In Forecast 0, the number of bicycle paths are upgraded. Figure 7-2 illustrates the changes in bicycle paths compared to the bicycle network in 2019. Red lines indicate were paths have been widened and blue lines indicate were bicycle paths have dedicated bike lanes.


*Figure 7-2 Upgraded bicycle infrastructure in Forecast 0. Red lines indicate were paths have been widened and blue lines indicate were bicycle paths have dedicated bike lanes.*

## 7.1 Model results

Model results are presented as table of key figures, as maps with absolute volumes for each mode and as difference maps for each mode.

### 7.1.1 Key figures

The following table shows total travel demand for all modes in the modelled area (capital area) for Forecast 0 and as comparison same values are shown for base year 2019. As shown in the following table total demand for travel is increasing by 14 % which is mostly due to population growth. As shown in the table car traffic growth is lowest in Forecast 0 compared to base year 2019 while it's the highest for bike. As described in previous chapter many improvements have been implemented for the bike network in forecast 0 that results in the biggest growth for bike in scenario 0.

| Mode | Base year | Forecast 0 | |
|---|---|---|---|
| | Total traffic | Total traffic | Growth |
| Car | 1,061,600 | 1,206,700 | 14% |
| Public Transport | 35,000 | 40,800 | 17% |
| Bike | 59,000 | 72,200 | 22% |
| **Total** | **1,155,600** | **1,319,700** | **14%** |
| DT* | 96,100 | 109,500 | 14% |
| HGV* | 48,200 | 55,000 | 14% |

*Table 7-2 Total traffic in base year and forecast 0*

**) DT and HGV share of car volumes*

### 7.1.2 Private transport

The following maps show the results for car traffic. All volumes are AAWT and difference maps show the change between current forecast and the base year 2019 were red colour indicates increase in car volume and green indicates decrease in car volume.

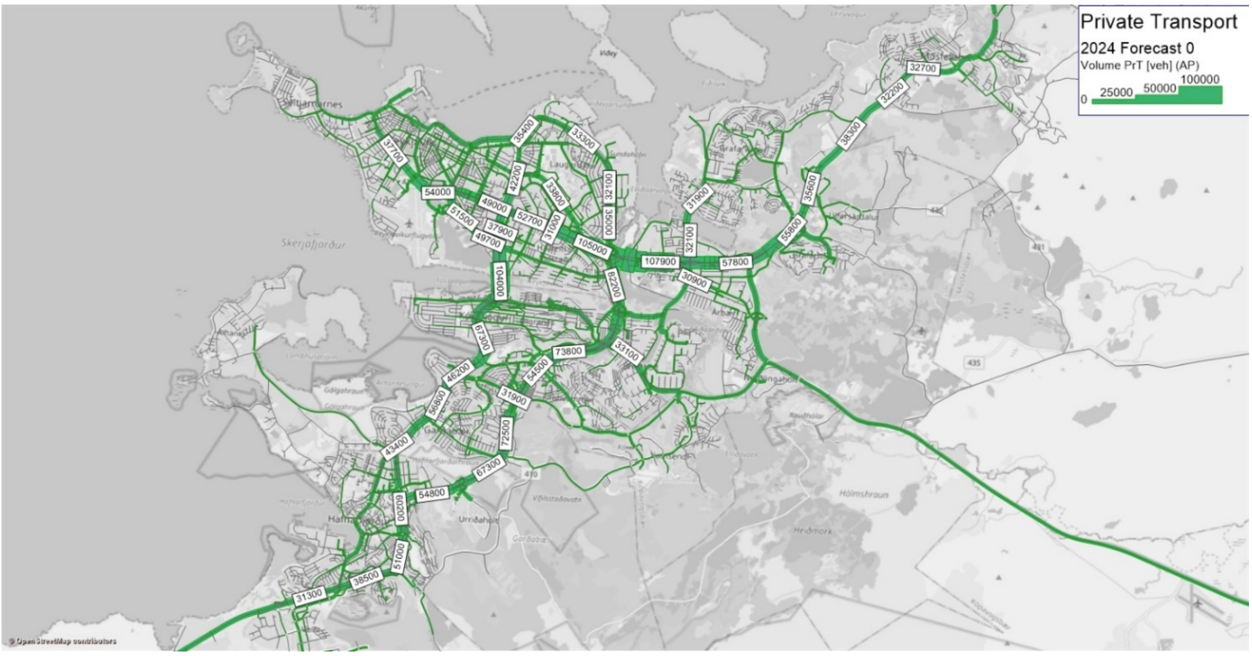



*Figure 7-3 AAWT traffic volumes Forecast 0 2024 – Overview*

As described previously in key figures car traffic is increasing due to population growth. Some local effects in route choices can be seen due to new road projects such as Arnarnesvegur.

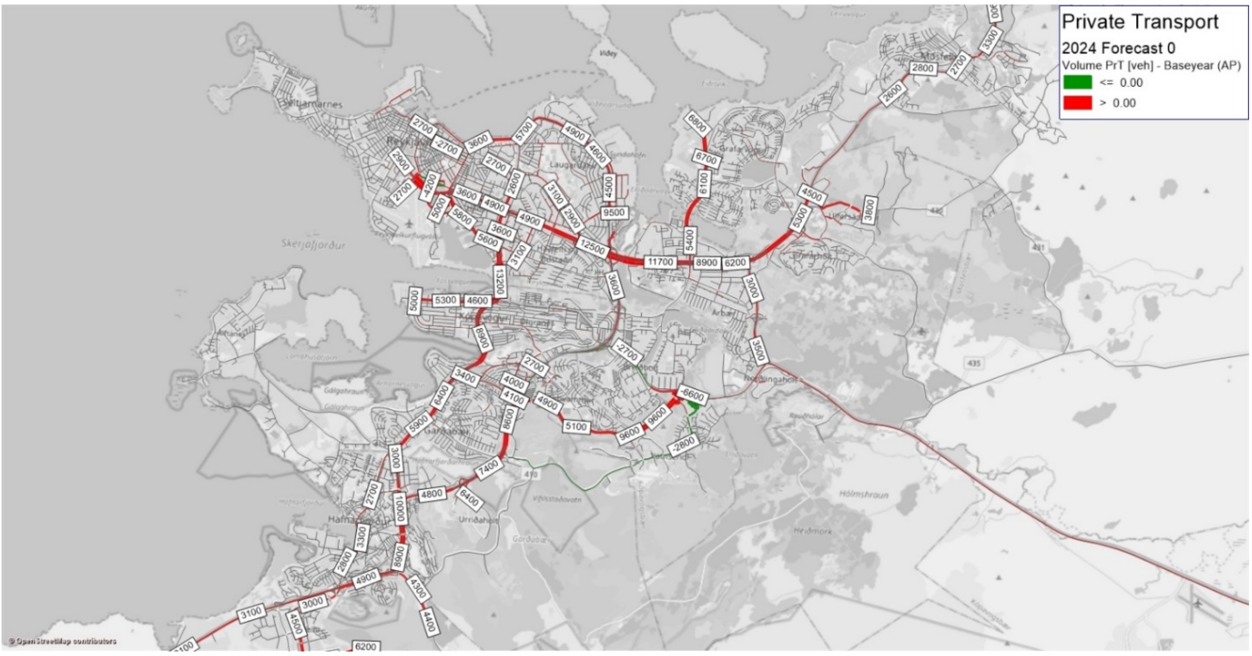



*Figure 7-4 Car volume difference map,* Forecast 0 2024 *compared to base year 2019 – Overview*

### 7.1.3 Public transport

The following maps show the results for public transport traffic. All volumes are number of passengers during average weekday and difference maps show the change between current forecast and the base year 2019 were red colour indicates increase in passenger volumes and green indicates decrease in passenger volume.

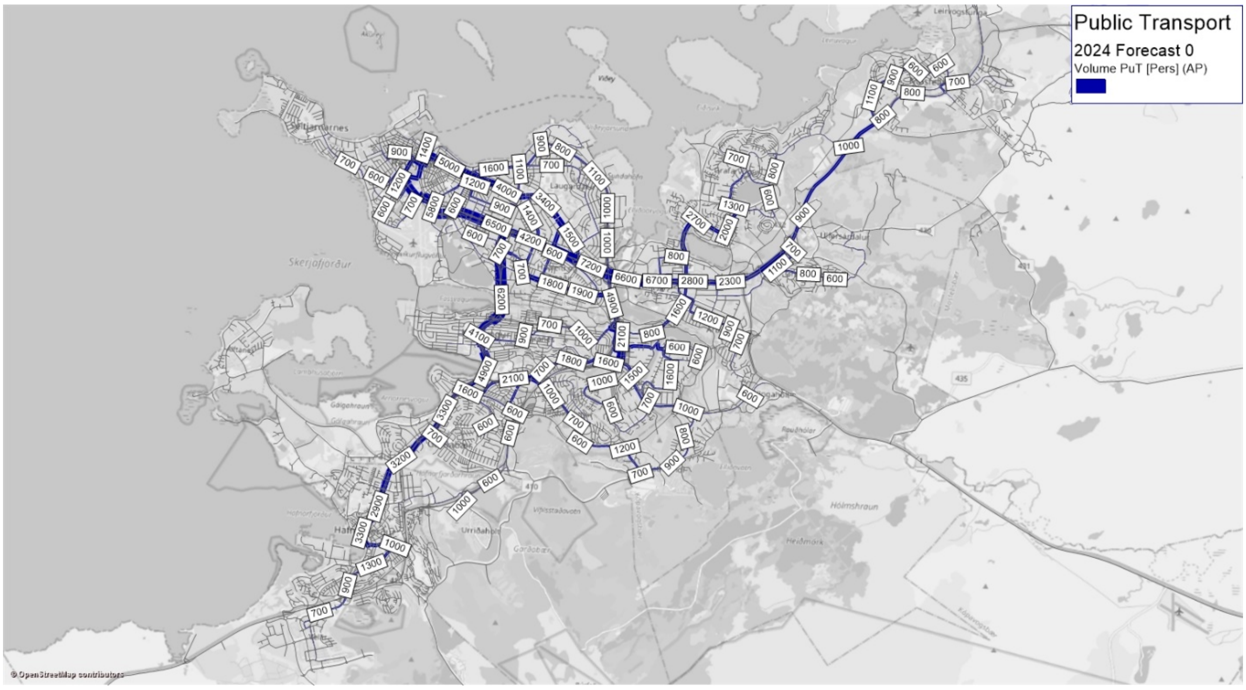



*Figure 7-5 Passenger volumes Forecast 0 2024 – Overview*

As described previously in key figures passenger traffic is increasing due to growth in population. Some local effects in route choices can be seen due to changes in line routes.


*Figure 7-6* *Passenger volume difference map,* Forecast 0 2024 *compared to base year 2019 – Overview*

## 7.1.4 Bike

The following maps show the results for bike traffic. All volumes are number of cyclists during average weekday and difference maps show the change between current forecast and the base year 2019 were red colour indicates increase in bike volumes and green indicates decrease in bike volume.

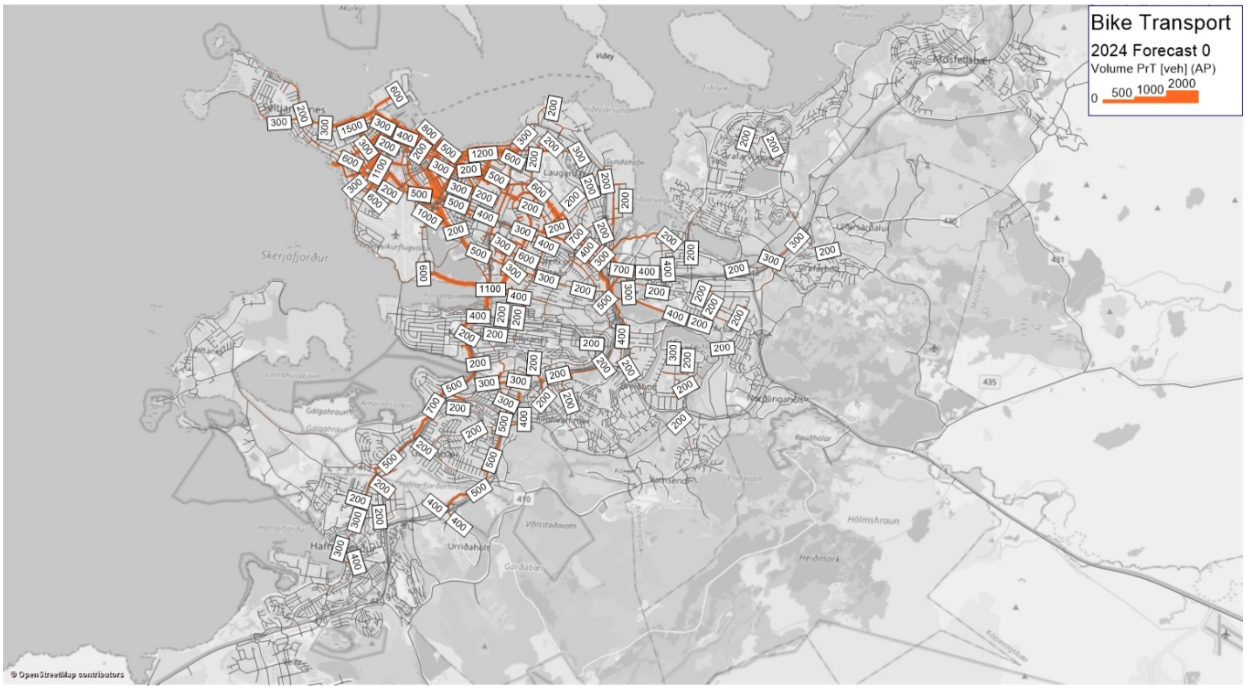



*Figure 7-7 Bicycle volumes Forecast 0 2024 – Overview*

As described previously in key figures bike traffic is increasing due to growth in population and shift from other modes due to bicycle network upgrades. Some local effects in route choices can be seen due to changes in path quality.


*Figure 7-8 Bike volume difference map, Forecast 0 2024 compared to base year 2019 – Overview*

# 8 Forecast 1

Forecast 1 is the first phase in the transport plan for the capital area (Samgöngusáttmáli höfuðborgarsvæðisinns). The construction phase is the first of three phases and includes infrastructure projects built from 2019 to 2024. The scenario includes changes in road infrastructure, public transport and bicycle path projects.

The changes in land use data for forecast 1 is identical with the land use data used in forecast 0 as listed in Figure 8-1. Changes for individual zones are shown in Appendix G.

| Category | Land use change in 2024 |
|---|---|
| Population (number of dwelling units) | |
| Single family houses | 1214 |
| Multi family apartments | 9008 |
| Land use (m²) | |
| Category 1) Shopping and service (high trip rates) | -1650* |
| Category 2) Shopping and service (low trip rates) | 19831 |
| Category 3) Light industry | 4800 |
| Category 4) Office and Schools | 44400 |
| Category 5) Storage and heavy industry | 9300 |
| Category 6) Specialized (church, prison, cemetery) | 0 |
| Category 7) Buildings with very small trip rates | 0 |

*Figure 8-1 Total changes in land use data in 2024 compared to the base year.*

**) Negative values indicate changes in other land use categories*

New infrastructure projects and road corridors upgraded in forecast 1 are listed below and illustrated in Figure 8-2.

Road projects included:

1) Reykjanesbraut: Kaldárselsvegur – Krísuvíkurvegur (Upgraded to 2+2 lane, 70km/h road)
2) Arnarnesvegur: Rjúpnavegur – Breiðholtsbraut (new 1+1 lane, 50km/h road)
3) Suðurlandsvegur: Bæjarháls – Vesturlandsvegur (Upgraded to 2+2 lane 80km/h road)
4) Vesturlandsvegur: Skarhólabraut – Hafravatnsvegur (Upgraded to 2+2 lane, 80km/h road)
5) Reykjanesbraut: Gatnamót við Bústaðaveg (Upgrade to grade separated junction)
6) Sæbrautarstokkur: Vesturlandsvegur – Holtavegur (Cut and cover tunnel with to 2+2 lane, 60km/h road. On top is a 1+1, 30km/h road.)

7) Miklabrautarstokkur: Snorrabraut – Rauðarárstígur (First phase of a cut and cover tunnel with to 2+2 lane, 70km/h road. On top is a 1+1, 50km/h road.)

Road corridors upgraded with BRT lanes (Borgarlína):

8) Borgarlína: Ártún – Hlemmur (Priority lane 1+1 and signal junction priority)

9) Borgarlína: Hamraborg – Hlemmur (Priority lane 1+1 and signal junction priority)

10) Borgarlína: Hamraborg – Lindir (Priority lane 1+1 and signal junction priority)

11) Borgarlína: Mjódd – Ártún (Priority lane 1+1 and signal junction priority)

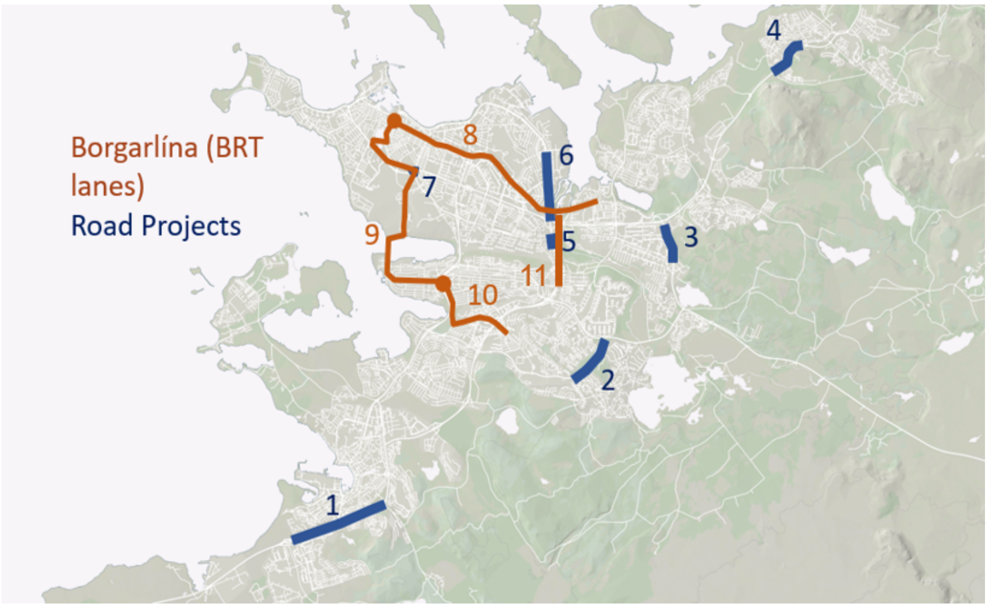



*Figure 8-2 infrastructure projects included in Forecast 1*

Changes to public transport were made on route alignments and in bus frequency. The bus public transport network is illustrated in Figure 8-3.

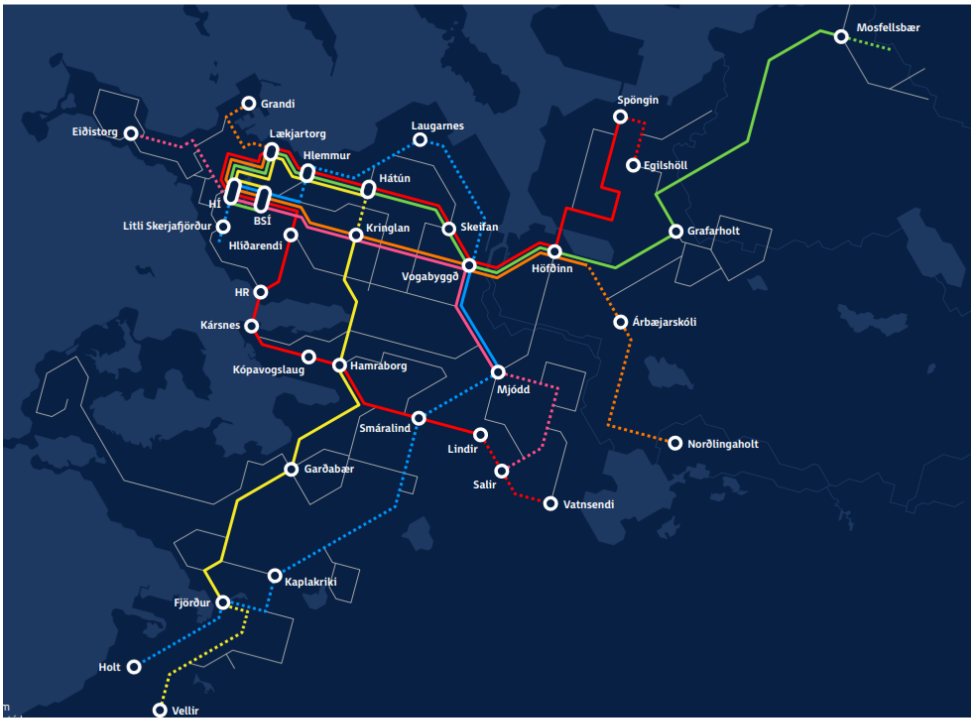



*Figure 8-3 Public transport network in Forecast 1 (coloured lines are main lines that will be upgraded to BRT lines and grey are other lines).*

Route alignments that has been upgraded to BRT lines in Forecast 1 are bus A, B and F. The proportion of the bus route length on priority lines is shown in Figure 8-4.

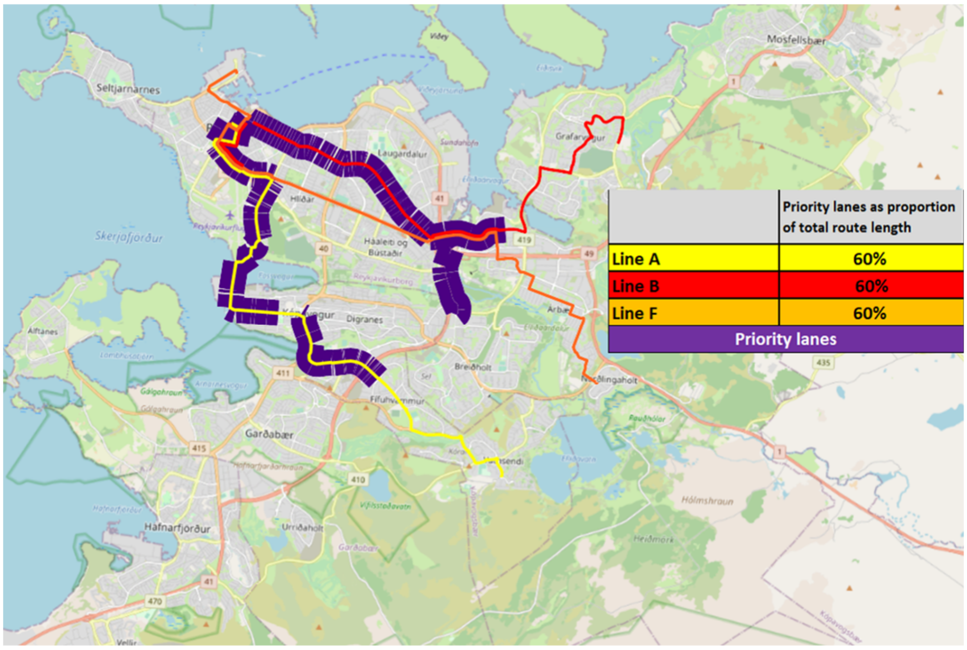



*Figure 8-4 The proportion of implementation of dedicated lanes for BRT routes and lines classified as BRT lines in the model.*

In Forecast 1 following public transport headways were used;

| Time of day | Headway BRT Lines | Headway regular Lines |
|---|---|---|
| 6:00-7:00 | 10 minutes | 15 minutes |
| 7:00-9:00 | 7-10 minutes | 15 minutes |
| 9:00-14:30 | 15 minutes | 15 minutes |
| 14:30 -18:00 | 7-10 minutes | 15 minutes |
| 18:00-21:00 | 15 minutes | 15 minutes |
| 21:00-01:00 | 20 minutes | 30 minutes |

*Table 8-1 Headway settings in different time intervals*

In Forecast 1, the bicycle paths illustrated in Figure 8-5 were upgraded to have dedicated bike lanes.

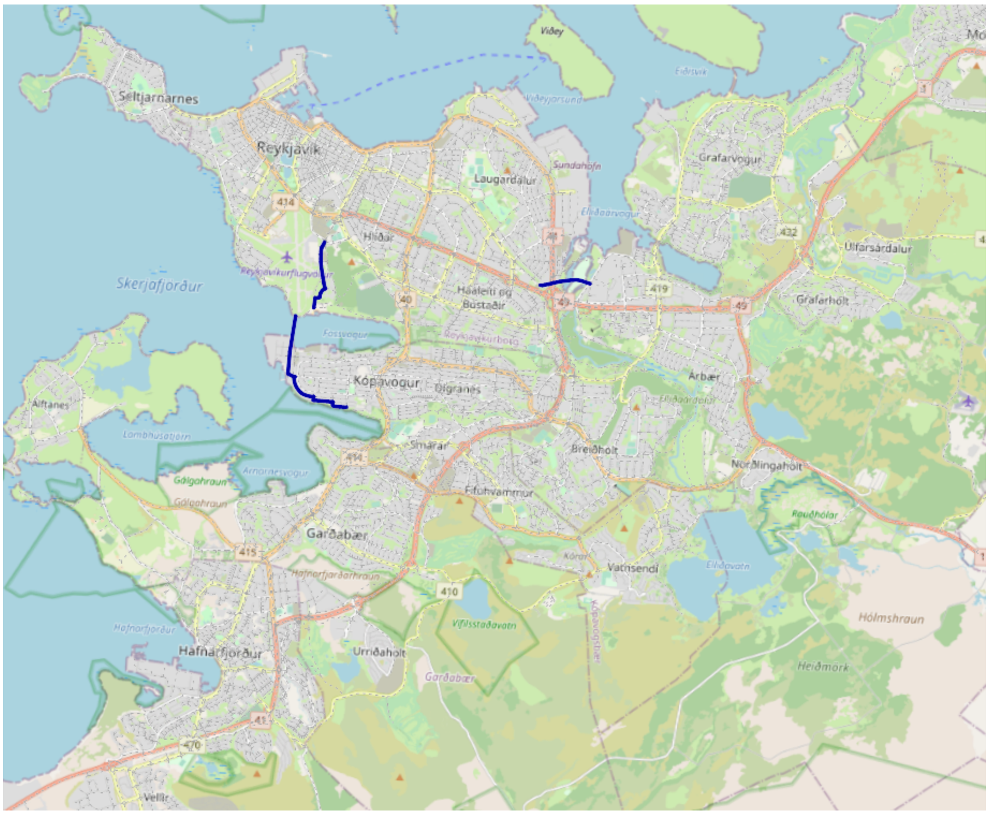



*Figure 8-5 Upgraded bicycle infrastructure in Forecast 1 compared to Forecast 0. Red lines indicate were paths have been widened and blue lines indicate were bicycle paths have dedicated bike lanes.*

## 8.1 Model results

Model results are presented as table of key figures, as maps with absolute volumes for each mode and as difference maps for each mode.

### 8.1.1 Key figures

The following table shows total travel demand for all modes in the modelled area (capital area) for Forecast 1 and as comparison same values are shown for base year 2019. As shown in the following table total demand for travel is increasing by 14 % which is mostly due to population growth. As shown in the table car traffic growth is lowest in Forecast 1 compared to base year 2019 while growth for public transport and bike is higher. This is due to shift in mode choice from car to bike or public transport. Largest growth is in public transport passenger trips which is due to increased quality of public transport in the scenario.

| Mode | Base year | Forecast 1 | |
|---|---|---|---|
| | Total traffic | Total traffic | Growth |
| Car | 1,061,600 | 1,193,400 | 12% |
| Public Transport | 35,000 | 50,600 | 45% |
| Bike | 59,000 | 71,900 | 22% |
| **Total** | **1,155,600** | **1,316,000** | **14%** |
| DT | 96,100 | 109,500 | 14% |
| HGV | 48,200 | 55,000 | 14% |

*Table 8-2 Total traffic in base year and forecast 0*

**) DT and HGV share of car volumes*

## 8.1.2 Private transport

The following maps show the results for car traffic. All volumes are AAWT and difference maps show the change between current forecast and the base year 2019 were red colour indicates increase in car volume and green indicates decrease in car volume.

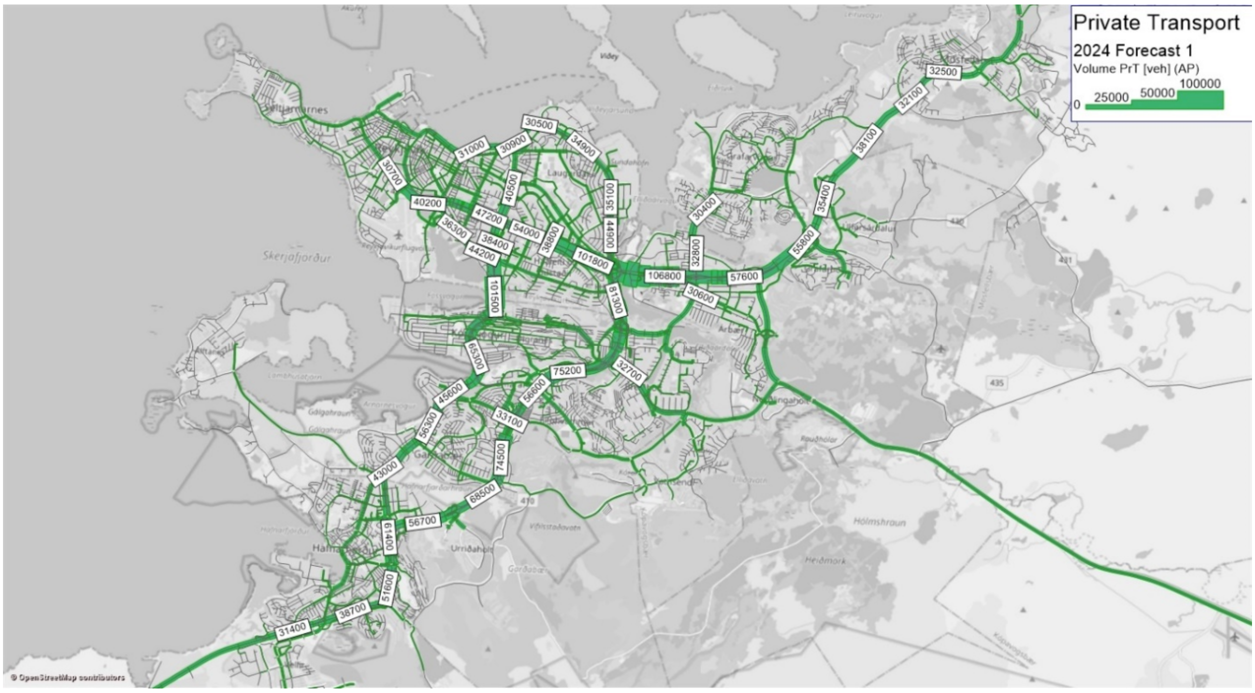



*Figure 8-6 AAWT traffic volumes Forecast 1 2024 – Overview*

As described previously in key figures car traffic is increasing due to population growth. Some local effects in route choices can also be seen due to new road projects such as Sæbrautarstokkur in combination with bus lanes on Suðurlandsbraut. Some changes can also be seen around the first phase of Miklubrautarstokkur and around Arnarnesvegur.

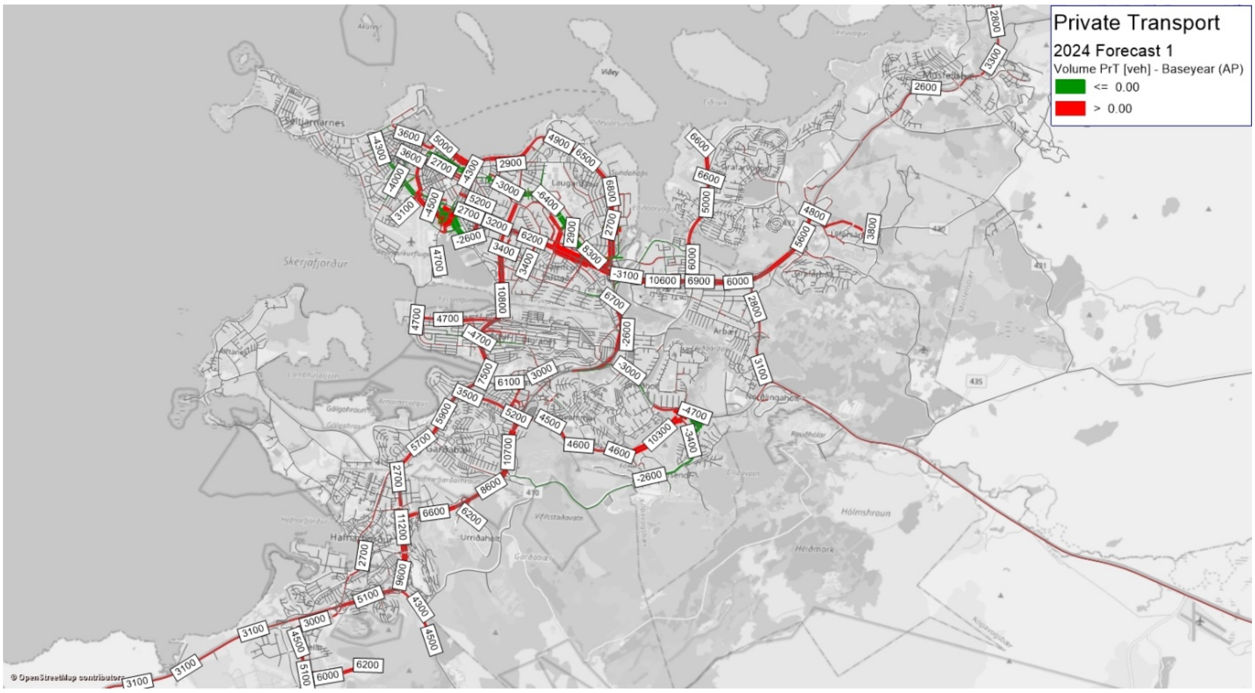



*Figure 8-7 Car volume difference map, Forecast 1 2024 compared to base year 2019 - Overview*

## 8.1.3 Public transport

The following maps show the results for public transport traffic. All volumes are number of passengers during average weekday and difference maps show the change between current forecast and the base year 2019 were red colour indicates increase in passenger volumes and green indicates decrease in passenger volume.

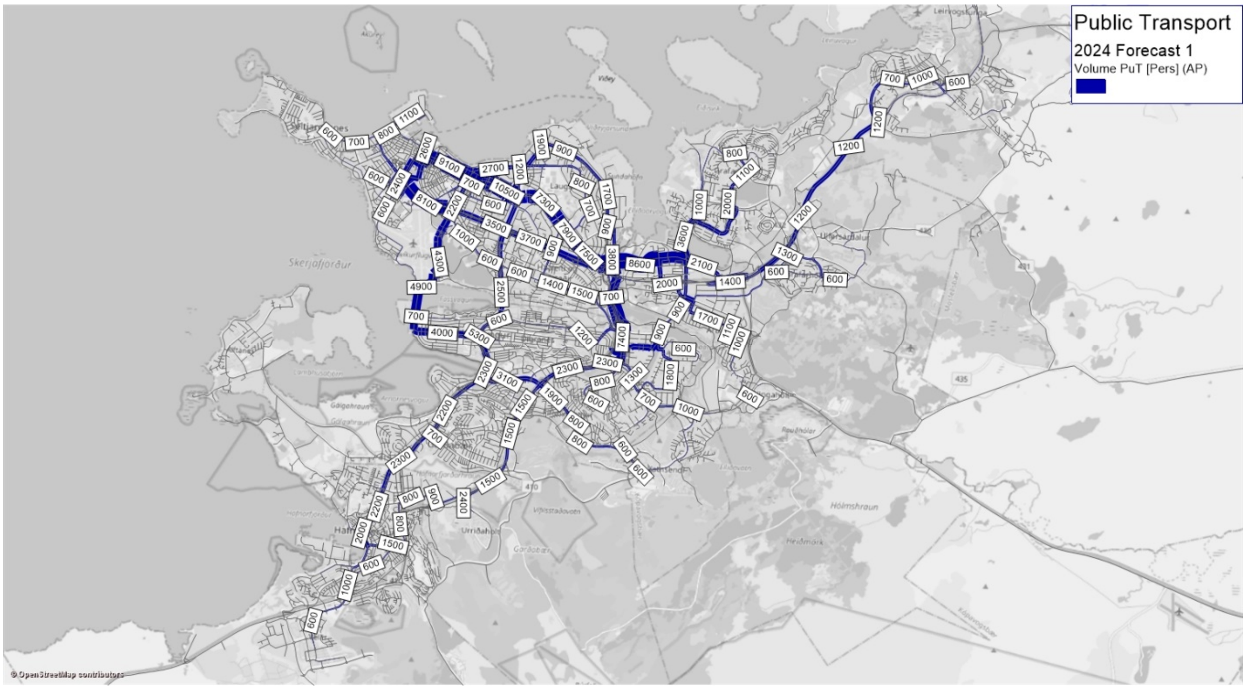



*Figure 8-8 Passenger volumes Forecast 1 2024 – Overview*

As described previously in key figures, passenger traffic is generally increasing due to growth in population and shift from other modes do to better service quality. Some local effects in route choices can be seen due to changes in line routes and bus lane projects such as bridge over Elliðaárvogur and Kársnes bridge.


*Figure 8-9 Passenger volume difference map, Forecast 1 2024 compared to base year 2019 – Overview*

### 8.1.4 Bike

The following maps show the results for bike traffic. All volumes are number of cyclists during average weekday and difference maps show the change between current forecast and the base year 2019 were red colour indicates increase in bike volumes and green indicates decrease in bike volume.

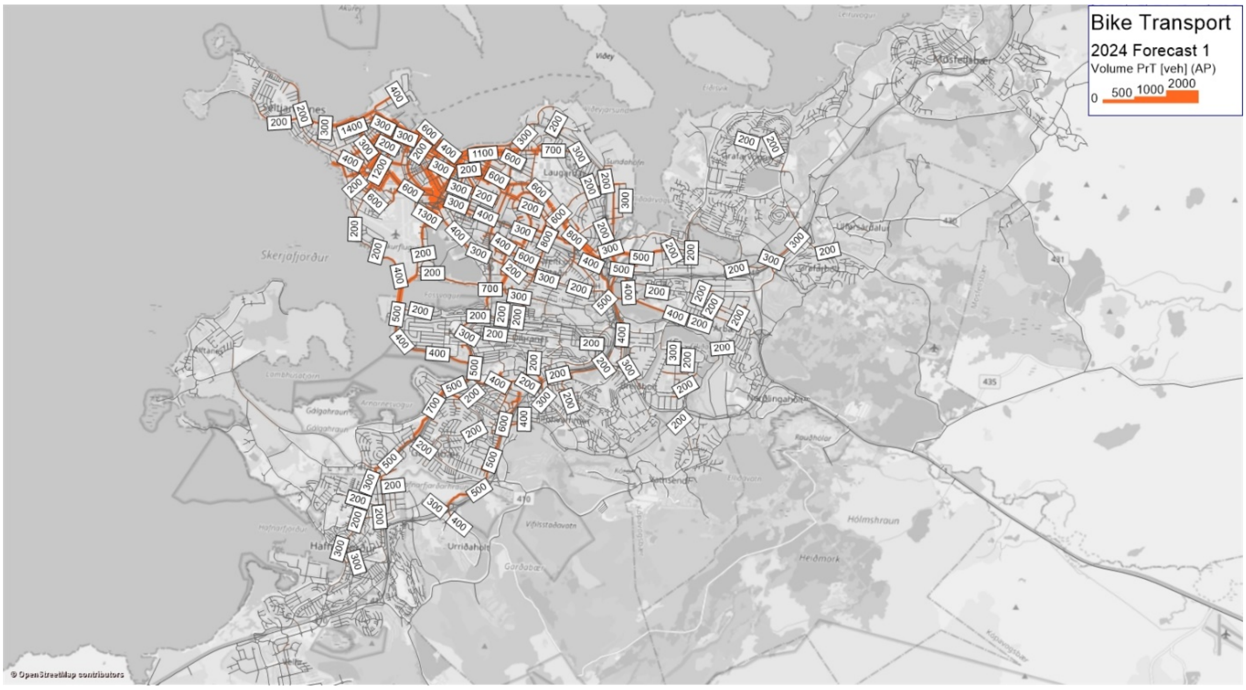



*Figure 8-10 Bicycle volumes Forecast 1 2024 – Overview*

As described previously in key figures bike traffic is increasing due to growth in population and shift from other modes due to bicycle network upgrades. Some local effects in route choices can be seen due to changes in path quality.


*Figure 8-11* *Bike volume difference map,* Forecast 1 2024 *compared to base year 2019 – Overview*

# 9 Forecast 2

Forecast 2 is the second phase in the transport plan for the capital area (Samgöngusáttmáli höfuðborgarsvæðisinns). The construction phase is the second of three phases and includes infrastructure projects built from 2025 to 2029. The scenario includes changes in road infrastructure, public transport and bicycle path projects.

Changes in land use data for forecast 2 are shown in Table 9-1 as sums for each category. Changes for individual zones are shown in Appendix H. Changes in land use, population, employment etc. are based on analysis done by the Icelandic housing financing fund (Íbúðalánasjóður) on population forecast data from Statistics Iceland (Hagstofan).

| Category | Land use change in 2029 |
|---|---|
| Population (number of dwelling units) | |
| Single family houses | 1147 |
| Multi family apartments | 6027 |
| Land use (m²) | |
| Category 1) Shopping and service (high trip rates) | -2500* |
| Category 2) Shopping and service (low trip rates) | 77800 |
| Category 3) Light industry | -1234* |
| Category 4) Office and Schools | 7300 |
| Category 5) Storage and heavy industry | -44502* |
| Category 6) Specialized (church, prison, cemetery) | -2742 |
| Category 7) Buildings with very small trip rates | 0 |

*Table 9-1 Total changes in land use data in 2029 compared to the 2024.*

***)** *Negative values indicate changes in other land use categories*

New infrastructure projects and road corridors upgraded in forecast 2 are listed below and illustrated in Figure 9-1.

Road projects included:

1) Reykjanesbraut: Kaldárselsvegur – Krísuvíkurvegur (Grade separation of 3 junctions)
2) Suðurlandsvegur: Norðlingavað – Bæjarháls (Upgraded to 2+2 lane, 80km/h road)
3) Miklabrautarstokkur: Rauðarárstígur – Kringlumýrarbraut (First phase of a cut and cover tunnel with to 2+2 lane, 70km/h road. On top is a 1+1, 50km/h road.)

Road corridors upgraded with BRT lanes (Borgarlína);

4) Borgarlína: Mjódd – BSÍ (Priority lane 1+1 and signal junction priority)

5) Borgarlína: Kringlan – Hamraborg (Priority lane 1+1 and signal junction priority)

6) Borgarlína: Fífan – Fjörður (Priority lane 1+1 and signal junction priority)

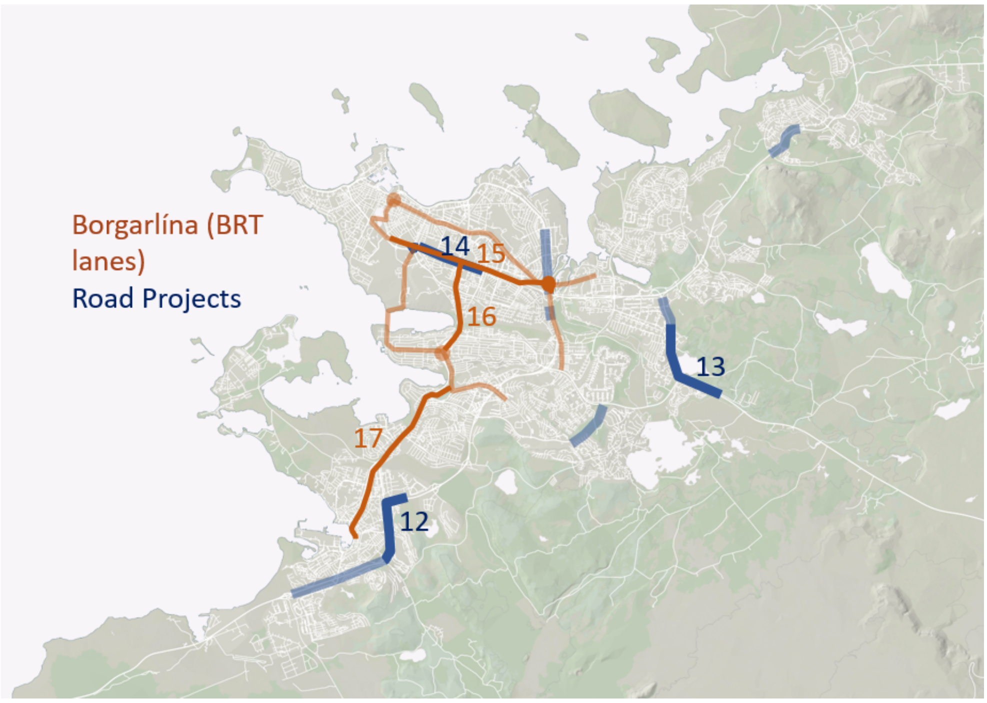



*Figure 9-1 infrastructure projects included in Forecast 2*

Changes to public transport were made on route alignments and in bus frequency.

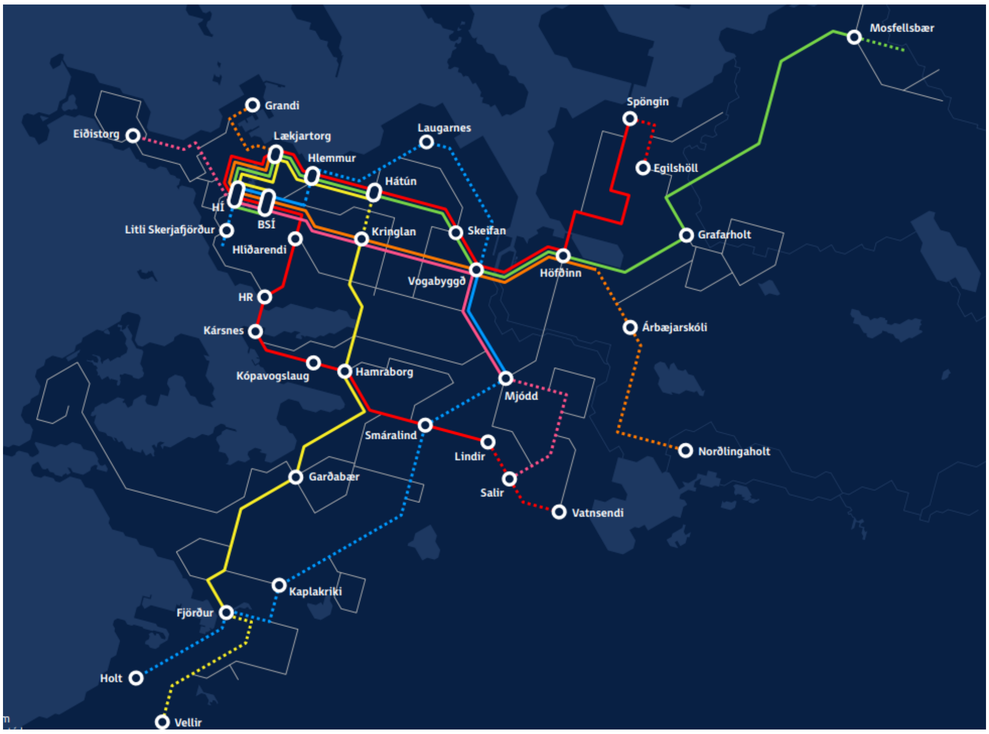



*Figure 9-2 Public transport network in Forecast 2 (coloured lines are main lines that will be upgraded to BRT lines and grey are other lines).*

Route alignments that has been upgraded to BRT lines in Forecast 2 are A, B, C, D and F and the proportion of the bus route length on priority lines is shown in Figure 9-3.

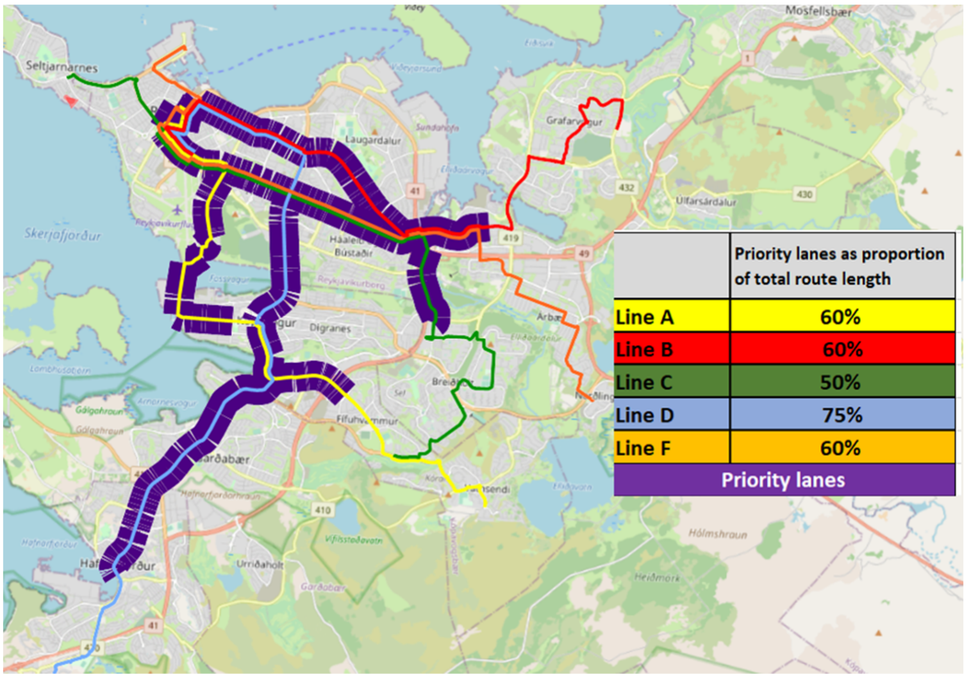



*Figure 9-3 The proportion of implementation of dedicated lanes for BRT routes and lines classified as BRT lines in the model.*

In Forecast 2 following public transport headways were used:

| Time of day | Headway BRT Lines | Headway regular Lines |
|---|---|---|
| 6:00-7:00 | 10 minutes | 15 minutes |
| 7:00-9:00 | 7-10 minutes | 15 minutes |
| 9:00-14:30 | 15 minutes | 15 minutes |
| 14:30 -18:00 | 7-10 minutes | 15 minutes |
| 18:00-21:00 | 15 minutes | 15 minutes |
| 21:00-01:00 | 20 minutes | 30 minutes |

*Table 9-2 Headway settings in different time intervals*

In Forecast 2, the bicycle path in Figure 9-4 were upgraded to have dedicated bike lanes.

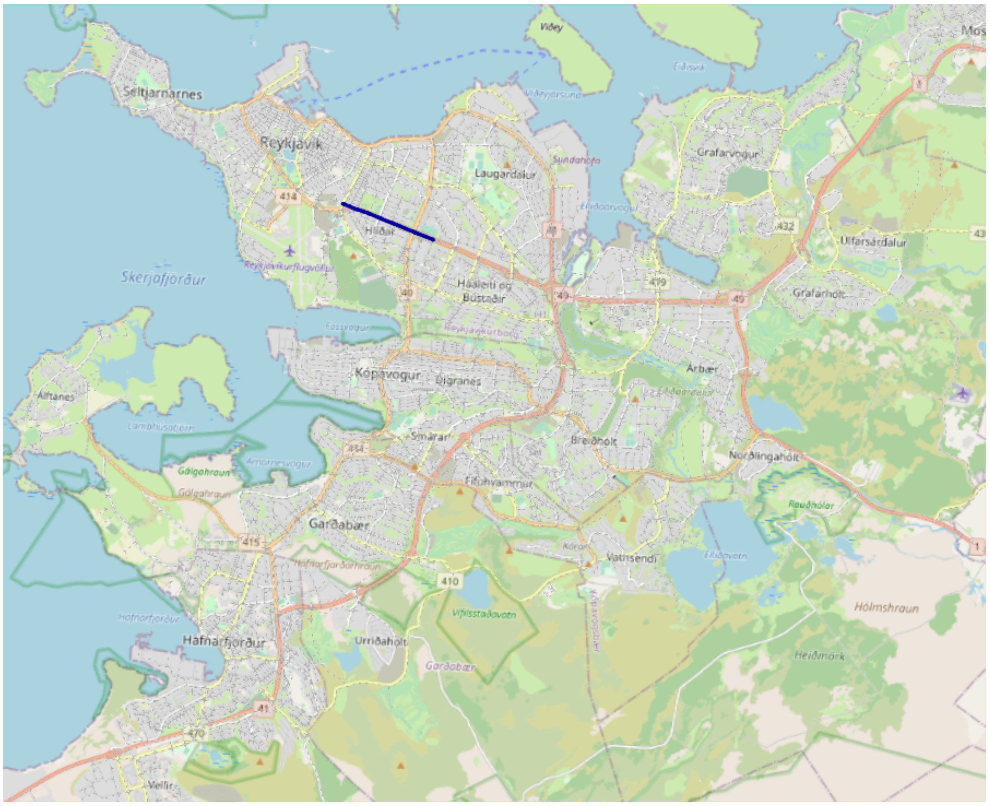



*Figure 9-4 Upgraded bicycle infrastructure in Forecast 2 compared to Forecast 1. Red lines indicate were paths have been widened and blue lines indicate were bicycle paths have dedicated bike lanes.*

## 9.1 Model results

Model results are presented as table of key figures, as maps with absolute volumes for each mode and as difference maps for each mode.

### 9.1.1 Key figures

The following table shows total travel demand for all modes in the modelled area (capital area) for Forecast 2 and as comparison same values are shown for base year 2019. As shown in the following table total demand for travel is increasing by 27,4% which is mostly due to population growth. As shown in the table car traffic growth is lowest in Forecast 2 compared to base year 2019 while growth for public transport and bike is highest. This is due to shift in mode choice from car to bike or public transport. Largest growth is in public transport passenger trips which is due to increased quality of public transport in the scenario.

| Mode | Base year | Forecast 2 | |
|---|---|---|---|
| | Total traffic | Total traffic | Growth |
| Car | 1,061,600 | 1,331,900 | 25% |
| Public Transport | 35,000 | 60,300 | 72% |
| Bike | 59,000 | 80,400 | 36% |
| **Total** | **1,155,600** | **1,472,600** | **27%** |
| DT* | 96,100 | 118,800 | 24% |
| HGV* | 48,200 | 59,600 | 124% |

*Table 9-3 Total traffic in base year and forecast 0*

*) *DT and HGV share of car volumes*

### 9.1.2 Private transport

The following maps show the results for car traffic. All volumes are AAWT and difference maps show the change between current forecast and the base year 2019 were red colour indicates increase in car volume and green indicates decrease in car volume.

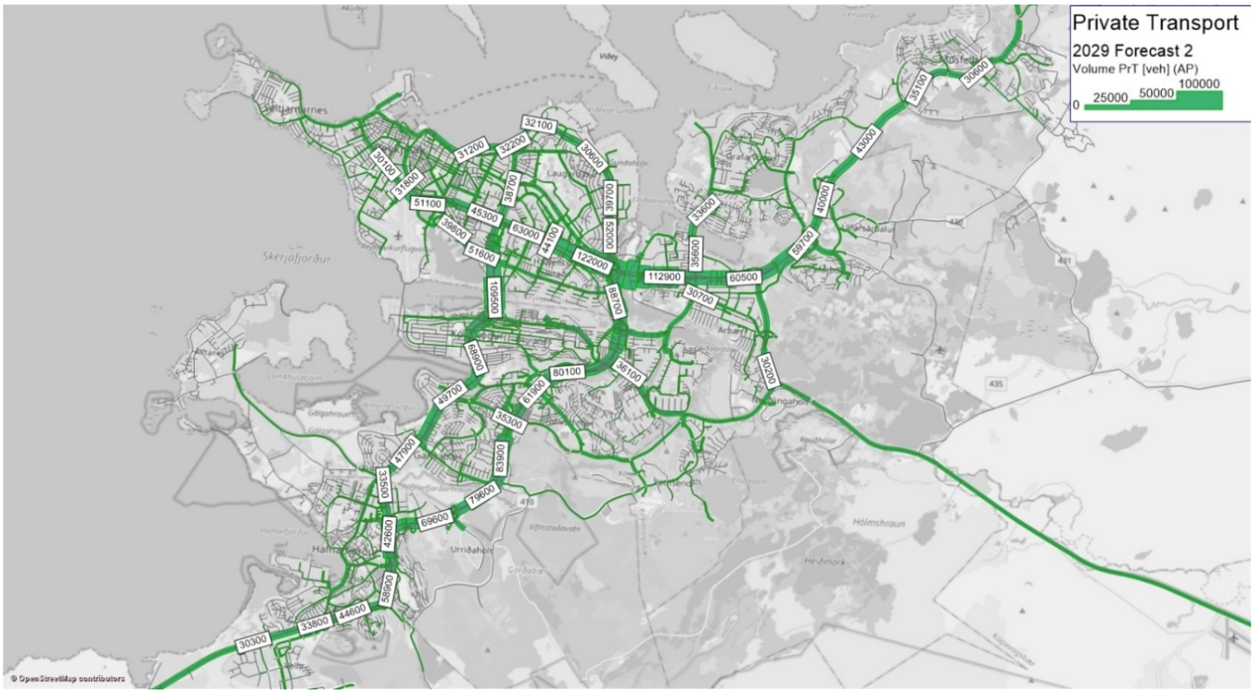



*Figure 9-5* *AAWT traffic volumes* Forecast 2 2029 – *Overview*

As described previously in key figures car traffic is increasing due to population growth. Some local effects in route choices can also be seen due to new road projects such as Sæbrautarstokkur in combination with bus lanes on Suðurlandsbraut. Some changes can also be seen around Miklubrautarstokkur and around Arnarnesvegur.

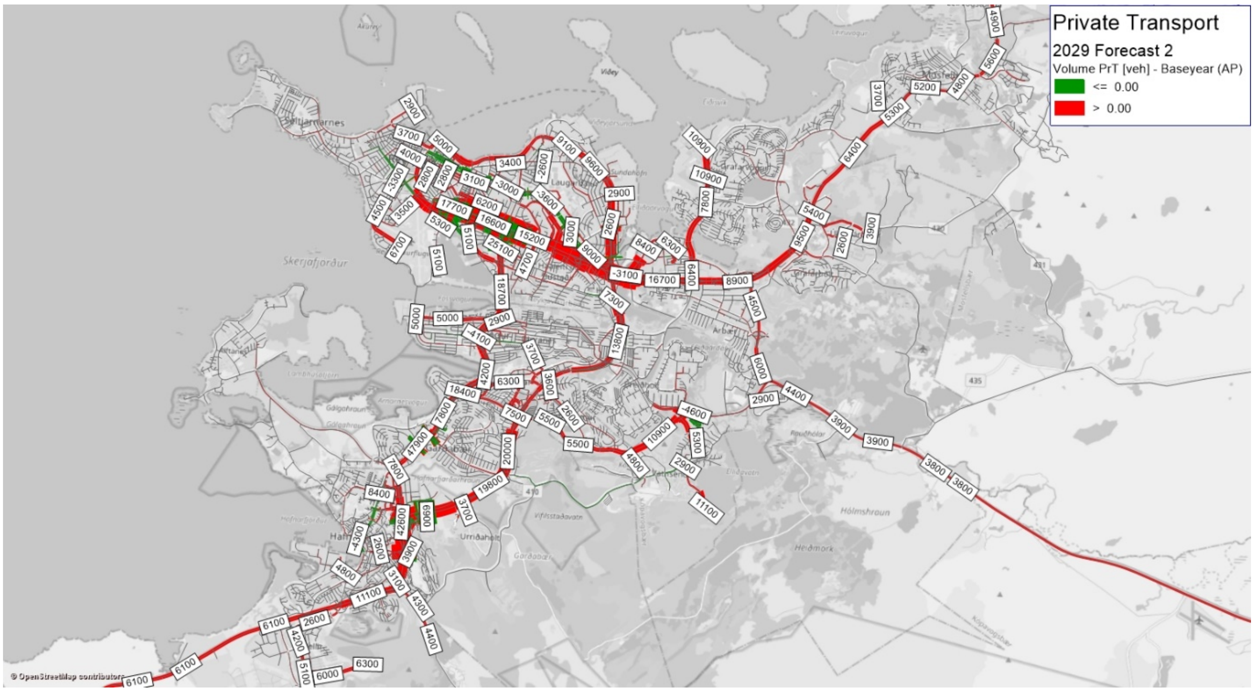



*Figure 9-6* *Car volume difference map, Forecast 2 2029 compared to base year 2019 – Overview*

### 9.1.3 Public transport

The following maps show the results for public transport traffic. All volumes are number of passengers during average weekday and difference maps show the change between current forecast and the base year 2019 were red colour indicates increase in passenger volumes and green indicates decrease in passenger volume.

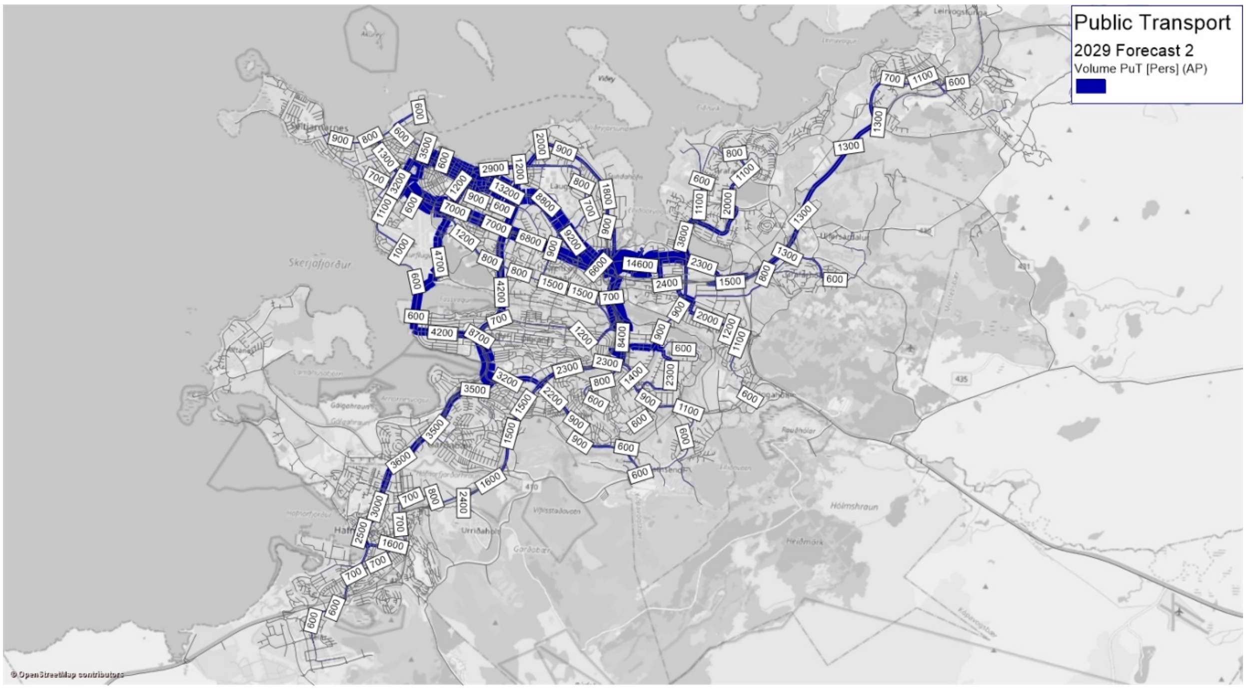



*Figure 9-7* *Passenger volumes* Forecast 2 2029 – *Overview*

As described previously in key figures, passenger traffic is generally increasing due to growth in population and shift from other modes due to better service quality. Some local effects in route choices can be seen due to changes in line routes and bus lane projects such as Miklubrautarstokkur, bridge over Elliðaárvogur and Kársnes bridge.

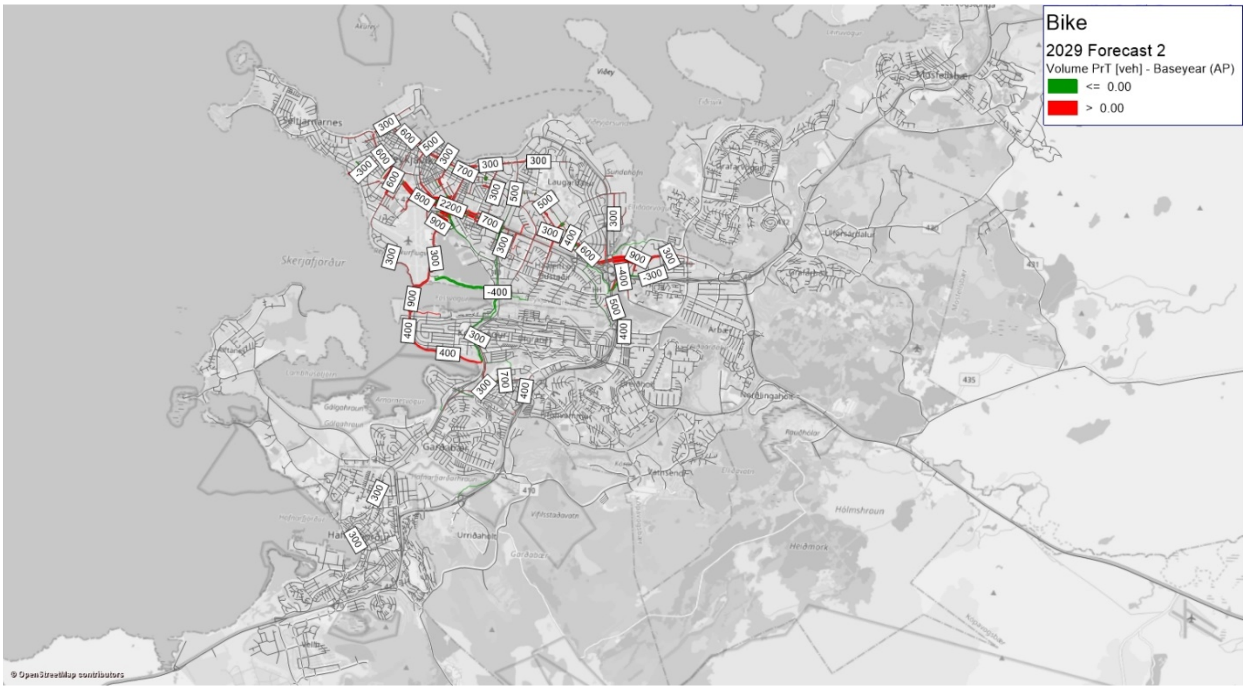



*Figure 9-8* *Passenger volume difference map,* Forecast 2 2029 *compared to base year 2019 – Overview*

## 9.1.4 Bike

The following maps show the results for bike traffic. All volumes are number of cyclists during average weekday and difference maps show the change between current forecast and the base year 2019 were red colour indicates increase in bike volumes and green indicates decrease in bike volume.

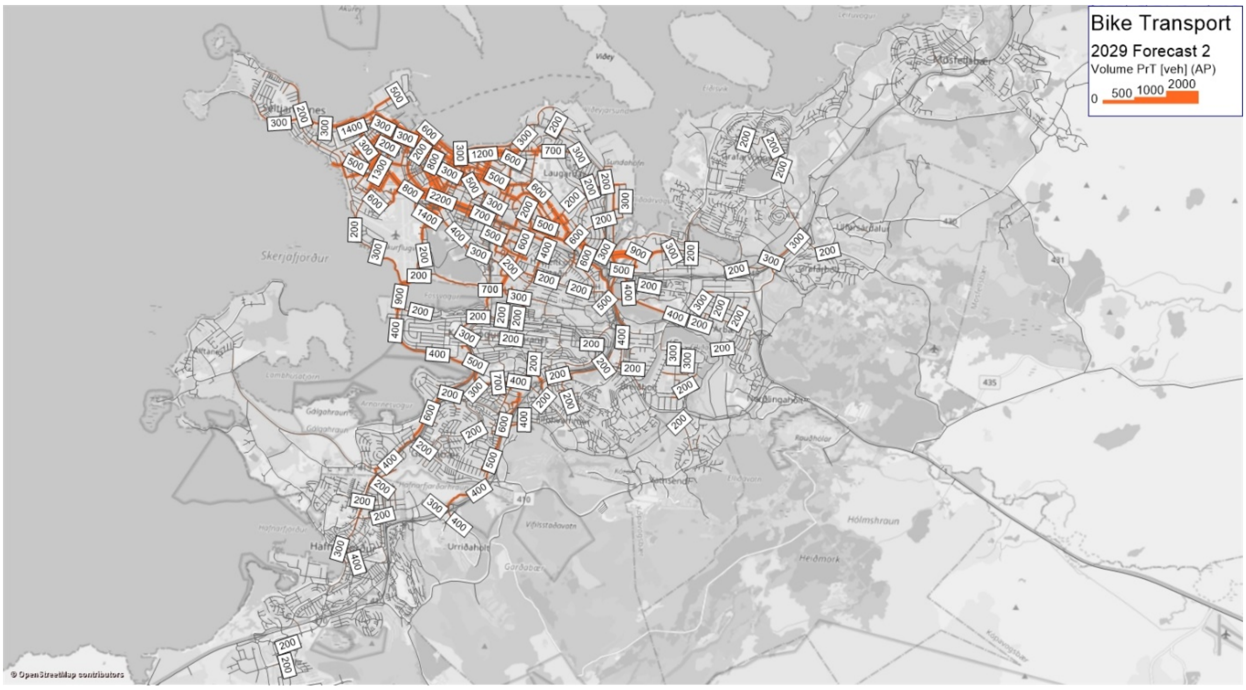



*Figure 9-9* *Bicycle volumes* Forecast 2 2029 *– Overview*

As described previously in key figures bike traffic is increasing due to growth in population and shift from other modes due to bicycle network upgrades. Some local effects in route choices can be seen due to changes in path quality and bridge projects such as Kársnes bridge and Elliðavogur bridge.

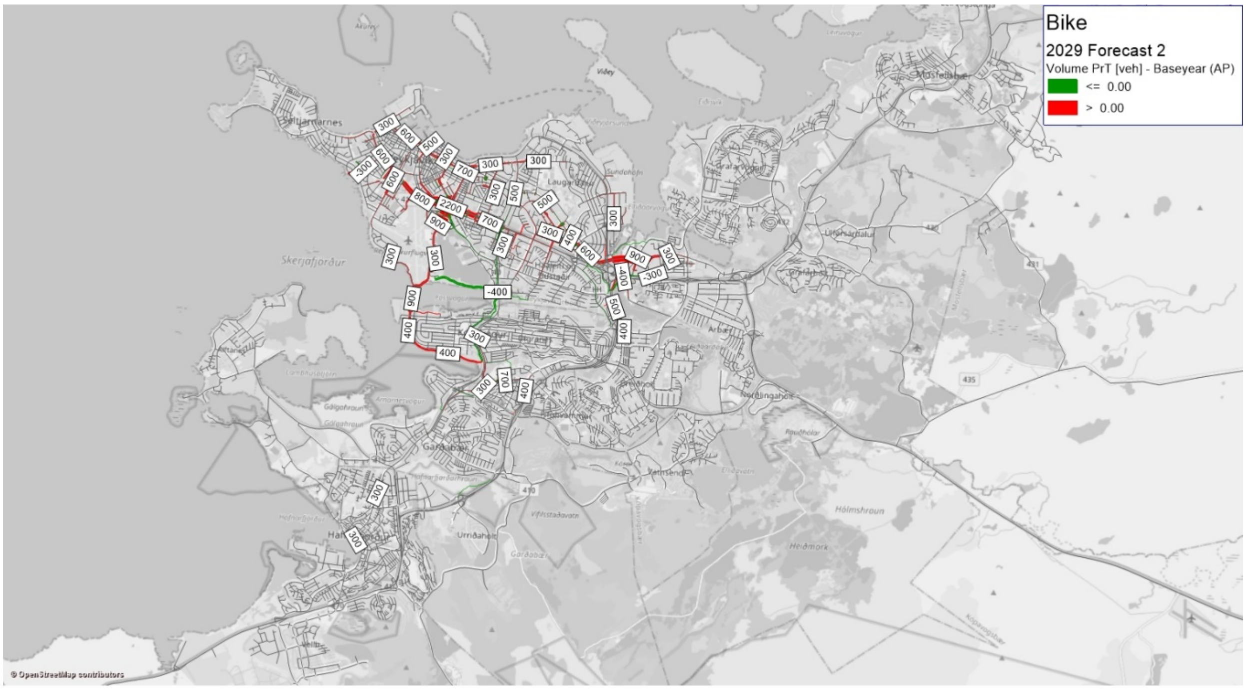



*Figure 9-10 Bike volume difference map, Forecast 2 2024 compared to base year 2019 – Overview*

# 10 Forecast 3

Forecast 3 is the third phase in the transport plan for the capital area (Samgöngusáttmáli höfuðborgarsvæðisinns). The construction phase is the third of three phases and includes infrastructure projects built from 2030 to 2034. The scenario includes changes in road infrastructure, public transport and bicycle path projects.

Changes in land use data for forecast 3 are shown in Table 10-1 as sums for each category. Changes for individual zones are shown in Appendix I. Changes in land use, population, employment etc are based on analysis done by the Icelandic housing financing fund (Íbúðalánasjóður) on population forecast data from Statistics Iceland (Hagstofan).

| Category | Land use change 2034 |
|---|---|
| Population (number of dwelling units) | |
| Single family houses | 745 |
| Multi family apartments | 8438 |
| Land use ($m^2$) | |
| Category 1) Shopping and service (high trip rates) | 44500 |
| Category 2) Shopping and service (low trip rates) | 16500 |
| Category 3) Light industry | 0 |
| Category 4) Office and Schools | 92100 |
| Category 5) Storage and heavy industry | -40150* |
| Category 6) Specialized (church, prison, cemetery) | 0 |
| Category 7) Buildings with very small trip rates | 0 |

*Table 10-1 Total changes in land use data in 2034 compared to the 2029.*

*) *Negative values indicate changes in other land use categories*

New infrastructure projects and road corridors upgraded in forecast 3 are listed below and illustrated in Figure 10-1.

Road projects included:

1) Hafnarfjarðarvegur: Cut and cower tunnel in Garðabær (Cut and cover tunnel with to 2+2 lane, 70km/h road. On top is a 1+1, 50km/h road.)

Road corridors upgraded with BRT lanes (Borgarlína):

2) Borgarlína: Ártún – Mosfellsbær (Priority lane 1+1 and signal junction priority)

3) Borgarlína: Ártún – Spöng (Priority lane 1+1 and signal junction priority)

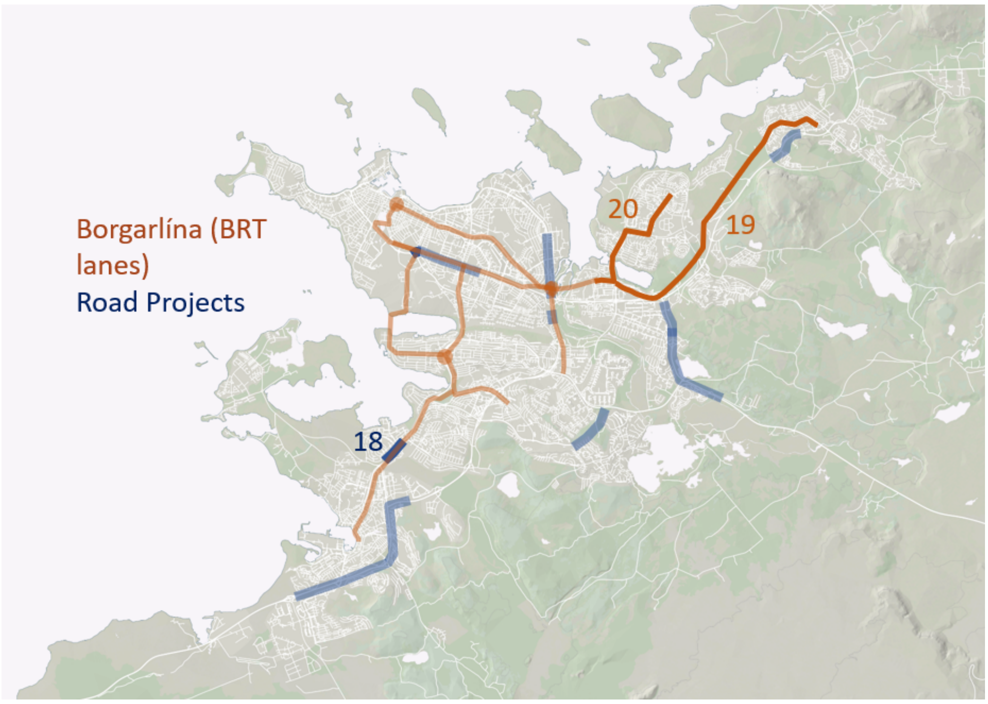



*Figure 10-1 infrastructure projects included in Forecast 3*

Changes to public transport were made on route alignments and in bus frequency. The public transport network is illustrated in Figure 10-4.

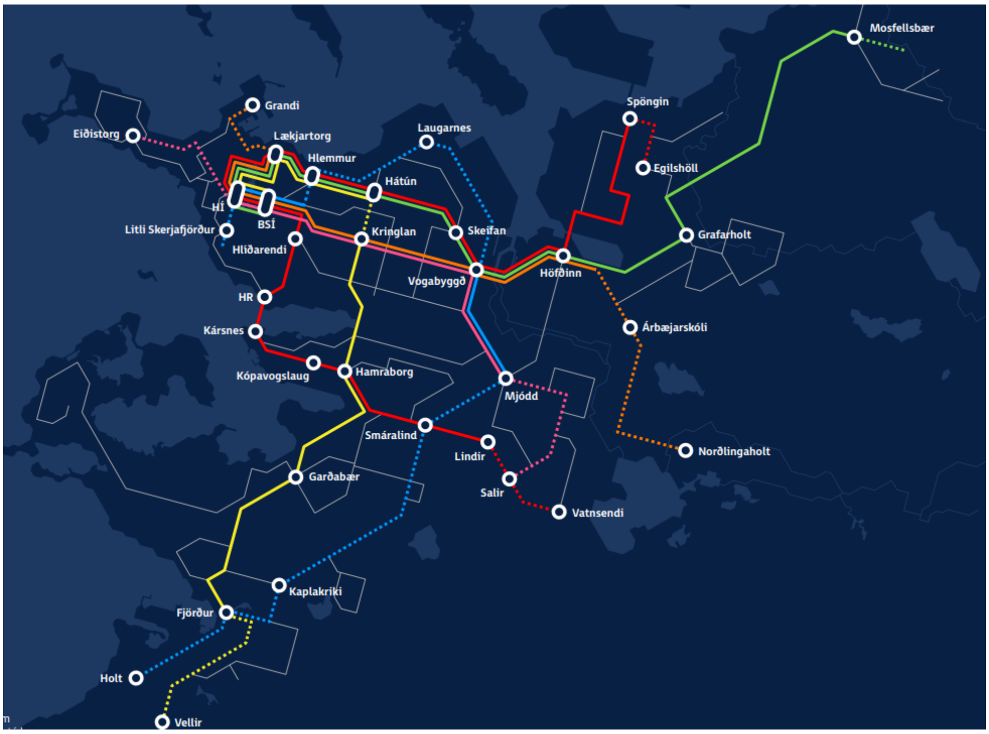



*Figure 10-2 Public transport network in Forecast 2 (coloured lines are main lines that will be upgraded to BRT lines and grey are other lines).*

Route alignments that has been upgraded to BRT lines in Forecast 3 are A, B, C, D, E and F and proportion of the bus route length on priority lines is illustrated in Figure 10-3.

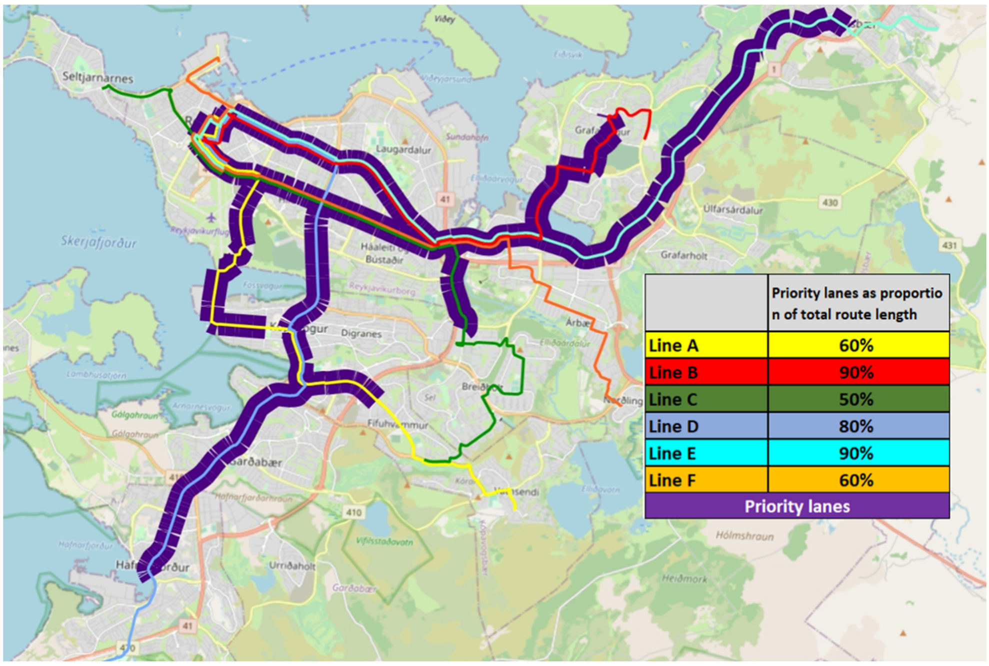



*Figure 10-3 The proportion of implementation of dedicated lanes for BRT routes and lines classified as BRT lines in the model.*

In Forecast 3, the following public transport headways were used;

| Time of day | Headway BRT Lines | Headway regular Lines |
|---|---|---|
| 6:00-7:00 | 10 minutes | 15 minutes |
| 7:00-9:00 | 7-10 minutes | 15 minutes |
| 9:00-14:30 | 15 minutes | 15 minutes |
| 14:30 -18:00 | 7-10 minutes | 15 minutes |
| 18:00-21:00 | 15 minutes | 15 minutes |
| 21:00-01:00 | 20 minutes | 30 minutes |

*Table 10-2 Headway settings in different time intervals*

In Forecast 3, the bicycle paths illustrated in Figure 10-4 were upgraded to have dedicated bike lanes.

*Figure 10-4 Upgraded bicycle infrastructure in Forecast 3 compared to Forecast 2. Red lines indicate were paths have been widened and blue lines indicate were bicycle paths have dedicated bike lanes.*

## 10.1 Model results

Model results are presented as table of key figures, as maps with absolute volumes for each mode and as difference maps for each mode.

### 10.1.1 Key figures

The following table shows total travel demand for all modes in the modelled area (capital area) for Forecast 3 and as comparison same values are shown for base year 2019. As shown in the following table total demand for travel is increasing by 44 % which is mostly due to population growth. As shown in the table car traffic growth is lowest in Forecast 3 compared to base year 2019 while share for public transport and bike is highest. This is due to shift in mode choice from car to bike or public transport. Largest growth is in public transport passenger trips which is due to increased quality of public transport in the scenario.

| Mode | Base year | Forecast 3 | |
|---|---|---|---|
| | Total traffic | Total traffic | Growth |
| Car | 1,061,600 | 1,498,000 | 41% |
| Public Transport | 35,000 | 72,900 | 108% |
| Bike | 59,000 | 88,500 | 50% |
| **Total** | **1,155,600** | **1,659,400** | **44%** |
| DT* | 96,100 | 130,000 | 35% |
| HGV* | 48,200 | 65,300 | 35% |

*Table 10-3 Total traffic in base year and forecast 0*

**) DT and HGV share of car volumes*

## 10.1.2 Private transport

The following maps show the results for car traffic. All volumes are AAWT and difference maps show the change between current forecast and the base year 2019 were red colour indicates increase in car volume and green indicates decrease in car volume.

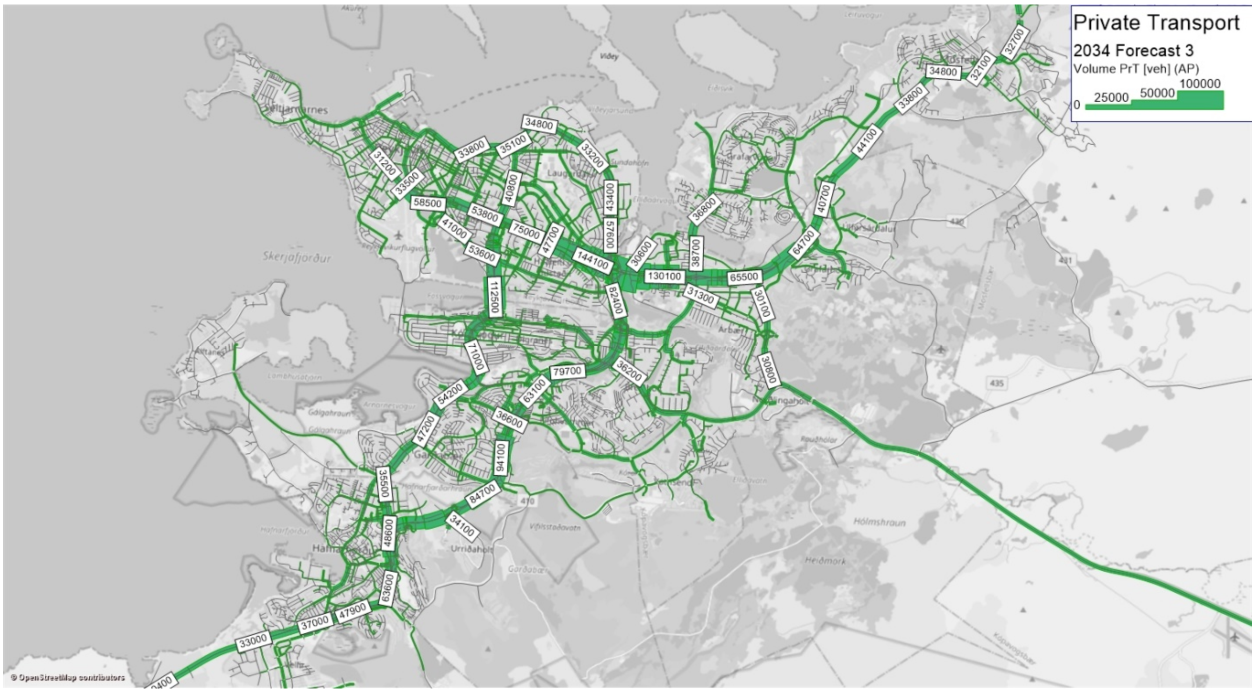



*Figure 10-5 AAWT traffic volumes* Forecast 3 2034 *– Overview*

As described previously in key figures car traffic is increasing due to population growth. Some local effects in route choices can also be seen due to new road projects such as Sæbrautarstokkur in combination with bus lanes on Suðurlandsbraut. Some changes can also be seen around Miklubrautarstokkur, Lyngásstokkur and around Arnarnesvegur.

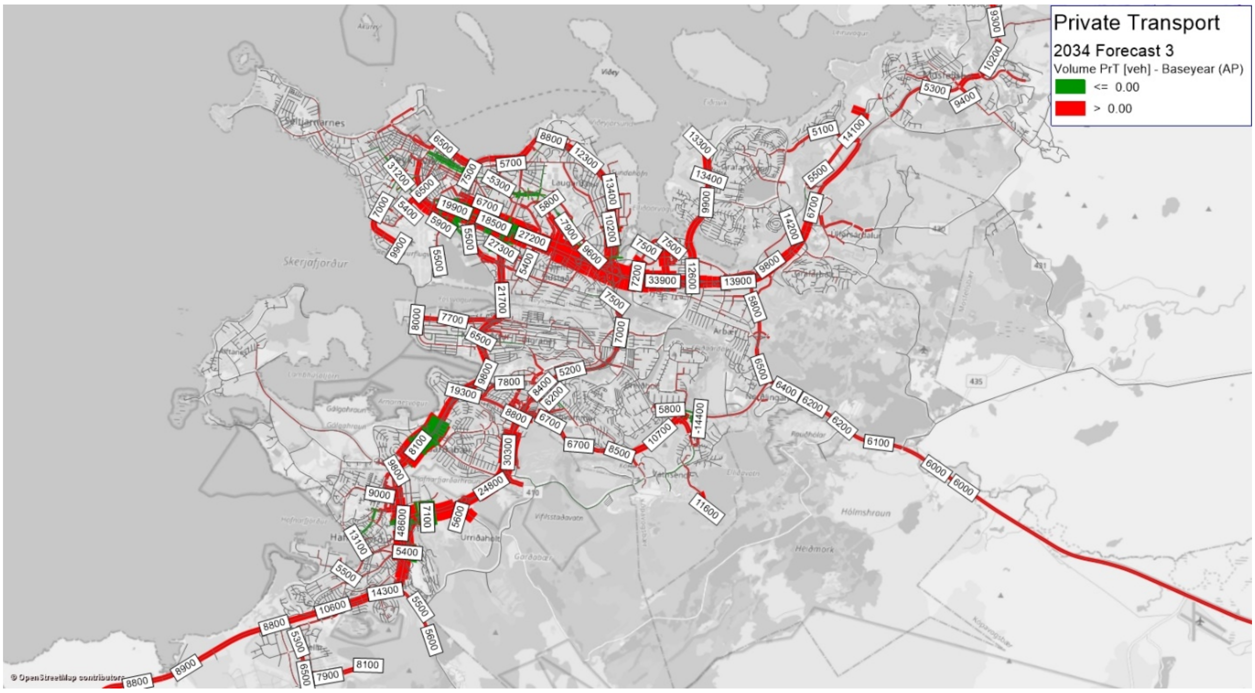



*Figure 10-6 Car volume difference map, Forecast 3 2034 compared to base year 2019 – Overview*

## 10.1.3 Public transport

The following maps show the results for public transport traffic. All volumes are number of passengers during average weekday and difference maps show the change between current forecast and the base year 2019 were red colour indicates increase in passenger volumes and green indicates decrease in passenger volume.


*Figure 10-7 Passenger volumes Forecast 3 2034 – Overview*

As described previously in key figures, passenger traffic is generally increasing due to growth in population and shift from other modes do to better service quality. Some local effects in route choices can be seen due to changes in line routes and bus lane projects such as Miklubrautarstokkur, new bus lanes trough Blikastaðaland and Kelduland, bridge over Elliðaárvogur and Kársnes bridge.


*Figure 10-8 Passenger volume difference map, Forecast 3 2034 compared to base year 2019 – Overview*

### 10.1.4 Bike

The following maps show the results for bike traffic. All volumes are number of cyclists during average weekday and difference maps show the change between current forecast and the base year 2019 were red colour indicates increase in bike volumes and green indicates decrease in bike volume.

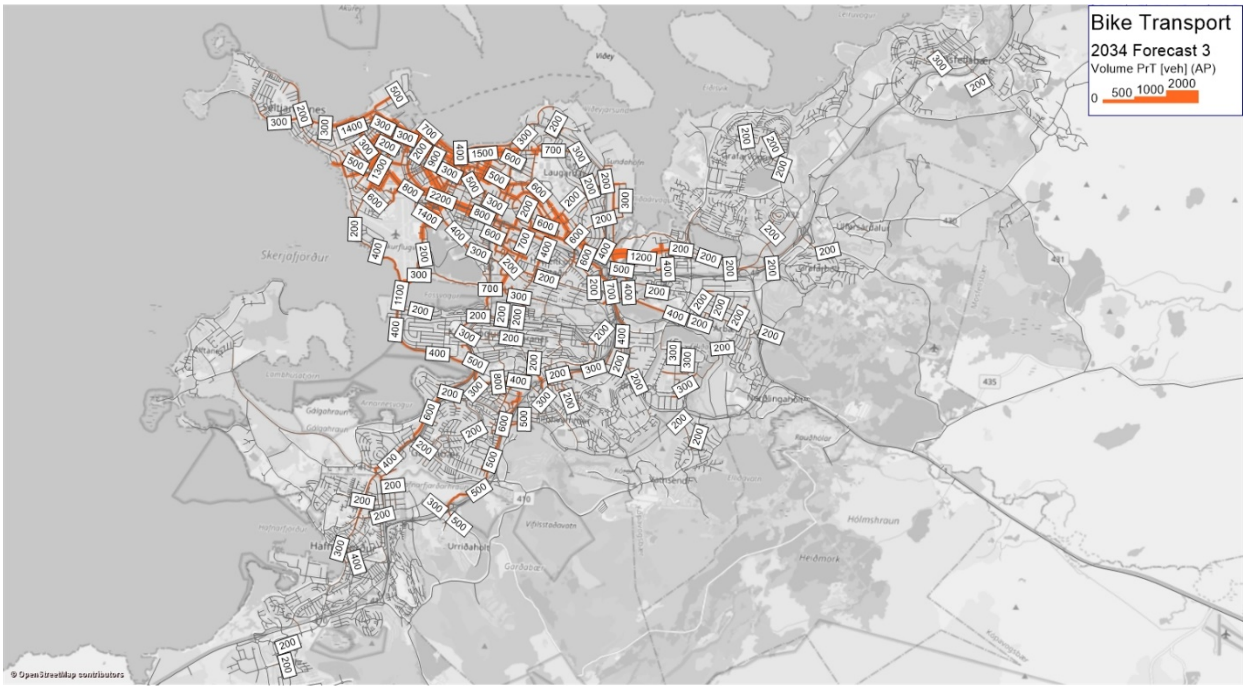



*Figure 10-9* *Bicycle volumes* Forecast 3 2034 – *Overview*

As described previously in key figures bike traffic is increasing due to growth in population and shift from other modes due to bicycle network upgrades. Some local effects in route choices can be seen due to changes in path quality and bridge projects such as Kársnes bridge and Elliðavogur bridge.

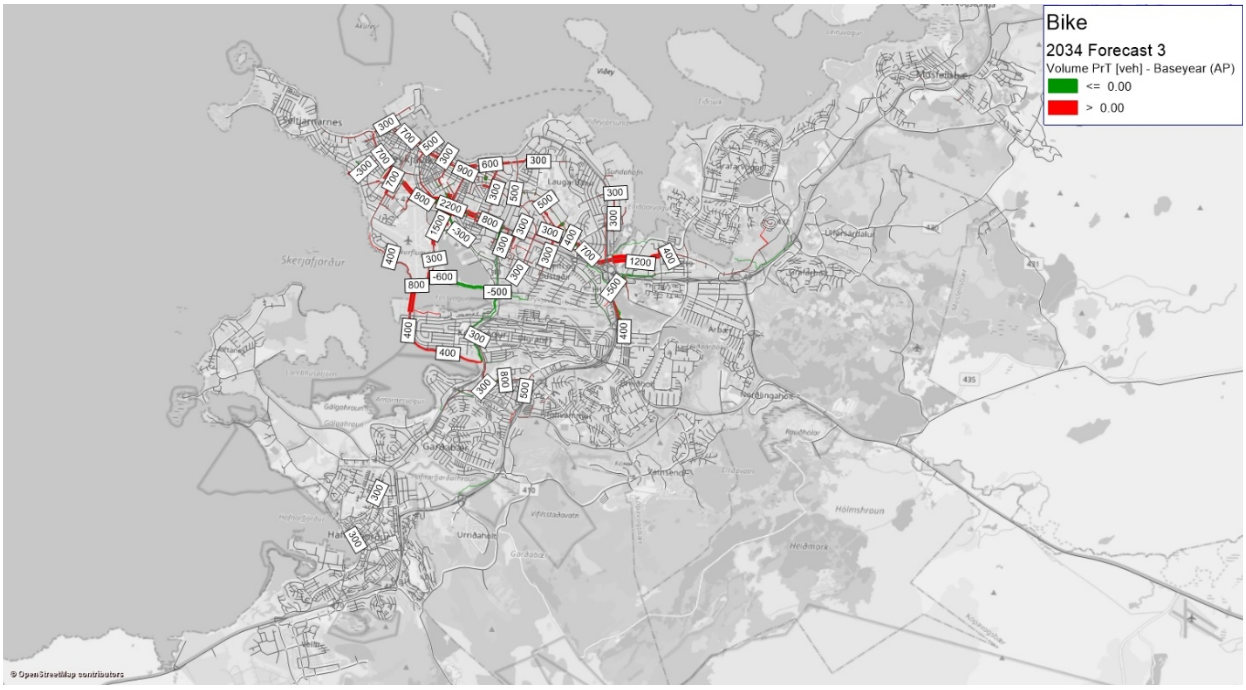



*Figure 10-10 Bike volume difference map, Forecast 3 2034 compared to base year 2019 – Overview*

# 11 Use of model or editing network in VISUM

The transport model for car, bike and public transport is coded in the same VISUM model, i.e. editing any of the three networks should be completed in the master VISUM model.

Model calculations are managed from the customized user interface and all relevant model procedure files are placed in the VISUM_TOOLS_SLH folder. The model calculation procedures are described in section 11.3.

When the model calculation is completed, the results of the traffic assignments will be saved in three different VISUM versions, one for Private Transport (car, DT and HGV), one for Bike and one for Public Transport. These VISUM versions can be used for analysing the results creating thematic maps etc.

Various settings are possible to adjust when analysing different forecast scenarios. Generally, it is not recommended to change the base year model parameters. However, some model variables are possible to adjust to e.g. sensitivity testing model results. The variables influencing the travel demand model that can be adjusted in the model system is described in section 11.1 and how new infrastructure projects can be implemented and validated is described in section 11.2.

## 11.1 Demand model data and settings

The residential data and workplace data are registered for each model zone. If analysing the impacts of new development plans, the number of households and the workplace areas for the single model zones can be adjusted. When changing the zone data, the relevant variables are accessible from a listings of zone data as illustrated in Figure 11-1 and Figure 11-2.

The relevant household variables names:

- TG_SingleFamily_2019 (Number of single-family households in 2019)
- TG_SingleFamily_2024
- TG_SingleFamily_2029
- TG_SingleFamily_2034
- TG_MultiFamily_2019 (Number of multi-family households in 2019)
- TG_MultiFamily_2024
- TG_MultiFamily_2029
- TG_MultiFamily_2034

List (Zones)

| Number: 348 | No | Code | Name | TG_SingleFamily_2019 | TG_SingleFamily_2024 | TG_MultiFamily_2019 | TG_MultiFamily_2024 |
|---|---|---|---|---|---|---|---|
| 1 | 1 | | Seltjarnarnes - | 506 | 0 | 602 | 37 |
| 2 | 2 | | Seltjarnarnes - | 227 | 0 | 376 | 0 |
| 3 | 3 | | Eiðsgrandi | 39 | 0 | 565 | 78 |
| 4 | 4 | | Skjólin | 152 | 0 | 492 | 0 |
| 5 | 5 | | Bráðræðisholt | 61 | 0 | 1049 | 0 |
| 6 | 6 | | Melarnir | 30 | 0 | 1010 | 0 |
| 7 | 7 | | Hagarnir | 55 | 0 | 860 | 0 |
| 8 | 8 | | Hagar/stofnanir | 0 | 0 | 0 | 0 |
| 9 | 9 | | Litli Skerjafj. | 56 | 0 | 665 | 0 |
| 10 | 10 | | Háskólinn | 0 | 0 | 0 | 60 |
| 11 | 11 | | Njarðargata | 0 | 0 | 0 | 0 |
| 12 | 12 | | Skerjafjörður | 156 | 0 | 106 | 0 |
| 13 | 13 | | Mýrargata | 29 | 0 | 123 | 282 |

*Figure 11-1 Zone list view of household variables for model zone 1-13 in 2019 and 2024. 2024, 2029 and 2034 variables describe the total change in number of households per model zone*

The relevant workplace and school variables names:

- TG_WorkPlace1_2019 (number of m² category 1 workplaces in 2019)
- TG_WorkPlace1_2024
- TG_WorkPlace1_2029
- TG_WorkPlace1_2034
- TG_WorkPlace2_2019, … TG_WorkPlace2_2034
- TG_WorkPlace3_2019, … TG_WorkPlace3_2034
- TG_WorkPlace4_2019, … TG_WorkPlace4_2034
- TG_WorkPlace5_2019, … TG_WorkPlace5_2034
- TG_WorkPlace6_2019, … TG_WorkPlace6_2034
- TG_WorkPlace7_2019, … TG_WorkPlace7_2034
- TG_Schools_2019, … TG_Schools_2034

List (Zones)

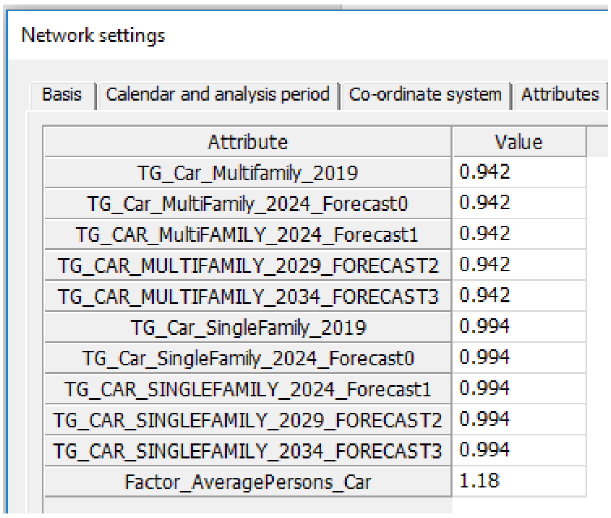
| Number: 348 | No | Name | TypeNo | TG_WorkPlace1_2019 | TG_WorkPlace2_2019 | TG_WorkPlace3_2019 | TG_WorkPlace4_2019 | TG_WorkPlace5_2019 | TG_WorkPlace6_2019 | TG_WorkPlace7_2019 | TG_Schools_2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | Seltjarnarnes - | 1 | 5008 | 1310 | 0 | 14523 | 5683 | 1487 | 0 | 0 |
| 2 | 2 | Seltjarnarnes - | 1 | 5452 | 315 | 0 | 2538 | 1751 | 0 | 0 | 0 |
| 3 | 3 | Eiðsgrandi | 1 | 0 | 0 | 0 | 5224 | 0 | 0 | 0 | 0 |
| 4 | 4 | Skjólin | 1 | 1236 | 514 | 0 | 6150 | 136 | 9 | 0 | 0 |
| 5 | 5 | Bráðræðisholt | 1 | 4048 | 192 | 0 | 4923 | 0 | 66 | 1072 | 0 |
| 6 | 6 | Melarnir | 1 | 1457 | 233 | 0 | 11829 | 92 | 0 | 0 | 0 |
| 7 | 7 | Hagarnir | 1 | 2423 | 94 | 0 | 11776 | 0 | 0 | 0 | 0 |
| 8 | 8 | Hagar/stofnanir | 1 | 6874 | 397 | 0 | 44700 | 0 | 1118 | 0 | 5500 |
| 9 | 9 | Litli Skerjafj. | 1 | 688 | 0 | 0 | 2717 | 0 | 0 | 0 | 0 |
| 10 | 10 | Háskólinn | 1 | 0 | 0 | 0 | 33849 | 0 | 4548 | 0 | 5500 |
| 11 | 11 | Njarðargata | 1 | 0 | 0 | 1235 | 1243 | 11921 | 0 | 55 | 0 |
| 12 | 12 | Skerjafjörður | 1 | 104 | 0 | 0 | 962 | 2530 | 54 | 0 | 150 |
| 13 | 13 | Mýrargata | 1 | 4571 | 141 | 0 | 8963 | 4473 | 0 | 0 | 0 |
| 14 | 14 | Framnesvegur | 1 | 2059 | 99 | 0 | 8406 | 1063 | 0 | 0 | 0 |
| 15 | 15 | Bræðrab.stígur | 1 | 429 | 0 | 0 | 919 | 425 | 10 | 0 | 0 |
| 16 | 16 | Bræðrab.stígur | 1 | 306 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | 17 | Slippurinn - Suð | 1 | 6037 | 55 | 416 | 10037 | 3532 | 7060 | 0 | 0 |
| 18 | 18 | Landak.spítali | 1 | 9995 | 0 | 0 | 6172 | 39 | 0 | 6 | 0 |
| 19 | 19 | Landakotshæð | 1 | 157 | 680 | 0 | 15713 | 0 | 721 | 0 | 0 |
| 20 | 20 | Hafnarhús - Miðb | 1 | 11423 | 0 | 0 | 25323 | 0 | 0 | 0 | 0 |

*Figure 11-2 Zone list view of attraction variables for 2019 data 2024, 2029 and 2034 data describe the total change in number of workplaces per model zone*

The overall share of households with car is high in Reykjavik. It is possible to adjust this factor to test the impacts changes in the car ownership to the traffic. If e.g. reducing the share of households with car, it will reduce the generated number of trips from households with access to car and increase the number of trips from households without car. This will consequently reduce the overall mode choice of the model.

The attribute names are listed below and illustrated in Figure 11-3.

- TG_Car_MultiFamily_2019 (Share of multi-family households with car in 2019)
- TG_Car_MultiFamily_2024_Forecast0
- TG_Car_MultiFamily_2024_Forecast1
- TG_Car_MultiFamily_2029_Forecast2
- TG_Car_MultiFamily_2034_Forecast3
- TG_Car_SingleFamily_2019 (Share of single-family households with car in 2019)
- TG_Car_SingleFamily_2024_Forecast0
- TG_Car_SingleFamily_2024_Forecast1
- TG_Car_SingleFamily_2029_Forecast2
- TG_Car_SingleFamily_2034_Forecast3




| Attribute | Value |
|---|---|
| TG_Car_Multifamily_2019 | 0.942 |
| TG_Car_MultiFamily_2024_Forecast0 | 0.942 |
| TG_CAR_MultiFAMILY_2024_Forecast1 | 0.942 |
| TG_CAR_MULTIFAMILY_2029_FORECAST2 | 0.942 |
| TG_CAR_MULTIFAMILY_2034_FORECAST3 | 0.942 |
| TG_Car_SingleFamily_2019 | 0.994 |
| TG_Car_SingleFamily_2024_Forecast0 | 0.994 |
| TG_CAR_SINGLEFAMILY_2024_Forecast1 | 0.994 |
| TG_CAR_SINGLEFAMILY_2029_FORECAST2 | 0.994 |
| TG_CAR_SINGLEFAMILY_2034_FORECAST3 | 0.994 |
| Factor_AveragePersons_Car | 1.18 |

*Figure 11-3 Network attributes defining car ownership used in the trip generation model and the average number of persons per car used when estimating generalised costs.*

The Mode-destination estimation is dependent on the generalised costs, which is an average perceived cost, estimated transport supply data (travel time, travel distance and out-of-pocket costs) and different weighting factors.

The input from the transport supply (i.e. model network) is described in section 11.2. As for the trip generation model, the general model parameters should not be adjusted as part of scenario analyses. There are however a few variables that could be adjusted in sensitivity tests of travel demand. This is the factors and prices related to out-off-pocket costs, that might change in future scenarios.

### 11.1.1 Number of persons per car

The base setting of the transport model assumes 1.18 persons per car. This factor is used to distribute the out-of-pocket costs between car drivers and passengers for parking and potential toll cost.

The factor is defined as a general network attribute as listed in Figure 11-3 and named as below.

- Factor_AveragePersons_Car

### 11.1.2 Parking

The parking cost are set specific for each model zone as illustrated in Figure 11-4. For the model zones with paid parking, three zone variables influence the out of pocket costs, that might be adjusted if new parking policies are introduced:

- P_Paid_Baseyear (Number of paid parking in base year 2019)
- P_Paid_Forecast0
- P_Paid_Forecast1
- P_Paid_Forecast2
- P_Paid_Forecast3
- P_Free_Baseyear (Number of free parking in base year 2019)
- P_Free_Forecast0
- P_Free_Forecast1
- P_Free_Forecast2
- P_Free_Forecast3
- PShare_Baseyear (Share of available parking lots for leisure and shopping purposes)
- PShare_Forecast0
- PShare_Forecast1
- PShare_Forecast2
- PShare_Forecast3
- Parking_Cost_Baseyear (Parking fee per hour)
- Parking_Cost_Forecast0
- Parking_Cost_Forecast1
- Parking_Cost_Forecast2
- Parking_Cost_Forecast3

List (Zones)

| Number: 348 | No | P_PAID_BASEYEAR | P_PAID_FORECAST0 | P_FREE_BASEYEAR | P_FREE_FORECAST0 | PSHARE_BASEYEAR | PSHARE_FORECAST0 | PARKING_COST_BASEYEAR | PARKING_COST_FORECAST0 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 0 | 0 | 0 | 0 | 100 | 100 | 0.00 | 0.00 |
| 2 | 2 | 0 | 0 | 139 | 139 | 100 | 100 | 0.00 | 0.00 |
| 3 | 3 | 0 | 0 | 150 | 150 | 100 | 100 | 0.00 | 0.00 |
| 4 | 4 | 0 | 0 | 710 | 710 | 100 | 100 | 0.00 | 0.00 |
| 5 | 5 | 0 | 0 | 189 | 189 | 100 | 100 | 0.00 | 0.00 |
| 6 | 6 | 0 | 0 | 773 | 773 | 100 | 100 | 0.00 | 0.00 |
| 7 | 7 | 0 | 0 | 893 | 893 | 100 | 100 | 0.00 | 0.00 |
| 8 | 8 | 0 | 794 | 794 | 0 | 10 | 10 | 0.00 | 170.00 |
| 9 | 9 | 0 | 0 | 255 | 255 | 100 | 100 | 0.00 | 0.00 |
| 10 | 10 | 123 | 360 | 237 | 0 | 10 | 10 | 170.00 | 170.00 |
| 11 | 11 | 0 | 0 | 629 | 629 | 100 | 100 | 0.00 | 0.00 |

*Figure 11-4 Zone list view with parking variables for base year and forecast 0*

### 11.1.3 Discount fare

The model is prepared to include road pricing or/and toll roads. This is implemented as part of the road network as described in 11.2.

The overall toll costs are distributed between the car driver and car passengers using the factor for average persons per car. In addition to this the cost is reduced with the expected share of the population with expected discount prices. It is e.g. presumed that a higher share of commuting trips has a discount fare. Furthermore, a discount factor determines how much the prices are reduced.

Similar assumptions are included for public transport fares, where students and commuters are presumed to special discount tickets.

The discount factor and discount share for car and public transport vary between travel purposes. The variables are defined as demand stratum constants as illustrated in the listing view in Figure 11-5 with the names:

- Discount_Factor_Car
- Discount_Factor_PuT
- Discount_Share_Car
- Discount_Share_PuT

List (Demand strata)

| Number: 14 | Code | Discount_Factor_Car | Discount_Factor_PuT | Discount_share_car | Discount_share_PuT |
|---|---|---|---|---|---|
| 1 | B_S0 | 0.60 | 0.68 | 0.60 | 0.57 |
| 2 | B_S1 | 0.60 | 0.68 | 0.60 | 0.57 |
| 3 | L_S0 | 0.60 | 0.68 | 0.50 | 0.57 |
| 4 | L_S1 | 0.60 | 0.68 | 0.50 | 0.57 |
| 5 | O_S0 | 0.60 | 0.68 | 0.50 | 0.57 |
| 6 | O_S1 | 0.60 | 0.68 | 0.50 | 0.57 |
| 7 | Sc_S0 | 0.60 | 0.77 | 0.75 | 1.00 |
| 8 | Sc_S1 | 0.60 | 0.77 | 0.75 | 1.00 |
| 9 | S_S0 | 0.60 | 0.68 | 0.50 | 0.57 |
| 10 | S_S1 | 0.60 | 0.68 | 0.50 | 0.57 |
| 11 | WP_S0 | 0.60 | 0.53 | 0.75 | 0.90 |
| 12 | WP_S1 | 0.60 | 0.53 | 0.75 | 0.90 |
| 13 | W_S0 | 0.60 | 0.53 | 0.75 | 0.90 |
| 14 | W_S1 | 0.60 | 0.53 | 0.75 | 0.90 |

*Figure 11-5 Demand strata list view of discount share and discount factors for car and public transport for the different transport purposes (B: Business, L: Leisure, O: Other, Sc: School, S: Shopping, WP: Work peak hour, W: Work. _S0 is households without car)*

## 11.2 Model network setup

The calculation of the base year model and the four base forecast models are managed from the customized user interface. This is described in section 11.3.

It is possible to create various scenarios from the different base model settings. If. e.g. interested in analysing the impacts of new additional infrastructure projects in 2029 or to analyse the impacts of a new city development area in

2029 the forecast 2 network should be imported, edited and saved before running the calculations from user interface. This editing process are described in the following sections.

## 11.2.1 Importing model network

From the master model it is possible to select if it is the base model or one of the four forecast models that should be imported. If signals are created or modified, then the specific AM and PM networks should be imported and saved separately. The network to be edited is selected from the Scripts menu as illustrated in Figure 11-6.

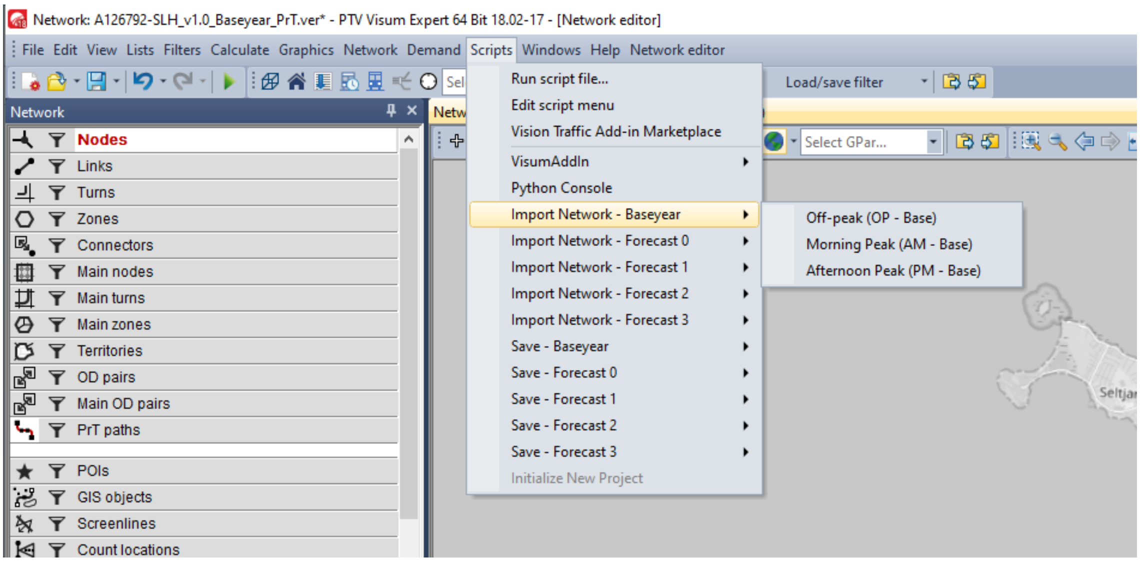
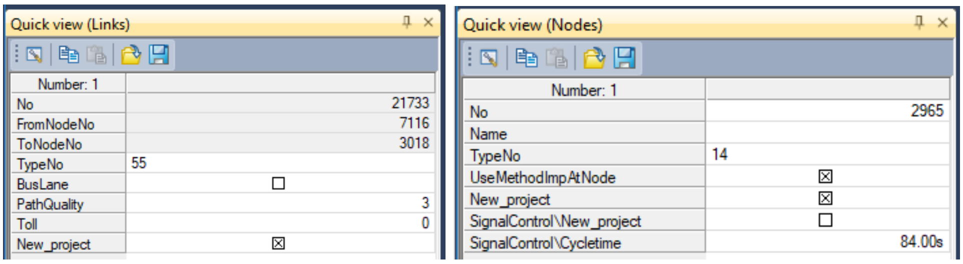



*Figure 11-6 Available import/export network functions used when editing the model network*

## 11.2.2 Network editing

When the relevant network is imported, the scenario settings should be implemented to the network. All relevant attributes can be listed in VISUMs quick view window. Otherwise, the network editing can also be completed from VISUMs listing views.

The network elements possible to edit or add to the model network is links, nodes, main nodes, turns, connectors, stop points and public transport routes. For all new network elements or edited elements, the check box "New_projekt" need to be checked as illustrated in Figure 11-7. This check box ensures that the editing is saved and included in the model calculations.



Quick view (Links)

| Number: 1 | |
|---|---|
| No | 21733 |
| FromNodeNo | 7116 |
| ToNodeNo | 3018 |
| TypeNo | 55 |
| BusLane | ☐ |
| PathQuality | 3 |
| Toll | 0 |
| New_project | ☒ |

Quick view (Nodes)

| Number: 1 | |
|---|---|
| No | 2965 |
| Name | |
| TypeNo | 14 |
| UseMethodImpAtNode | ☒ |
| New_project | ☒ |
| SignalControl\New_project | ☐ |
| SignalControl\Cycletime | 84.00s |

*Figure 11-7 Quick view layout with all relevant attributes for links and nodes.*

Table 11-1 describes all the user attributes necessary to update when implementing new network elements or adding changes to the existing network for the cars, delivery trucks, trucks and bikes. Special focus needs to be put on changes or updates to ICA nodes and changes that involve roundabout and main nodes.

Roundabouts are modelled as main nodes. It is important to ensure that the nodes included in the main nodes are the active roundabout nodes. If new intersections are created to replace the roundabout as illustrated in Figure 11-8, the new nodes should not be included in the main node.

The ICA nodes are dependent on the intersection geometry settings. If changes in intersections are necessary, new parallel intersections need to be created as illustrated in Figure 11-9. The new parallel links need to be created with all relevant link attributes and the original links need to be closed, i.e. setting the link type number to 9. Both the new links and the closed links need to be marked as "New_project". The geometry settings of the intersection are described in more details in section 11.2.3. If the original node is an ICA node, the "UseMethodImpAtNode" should be inactive.

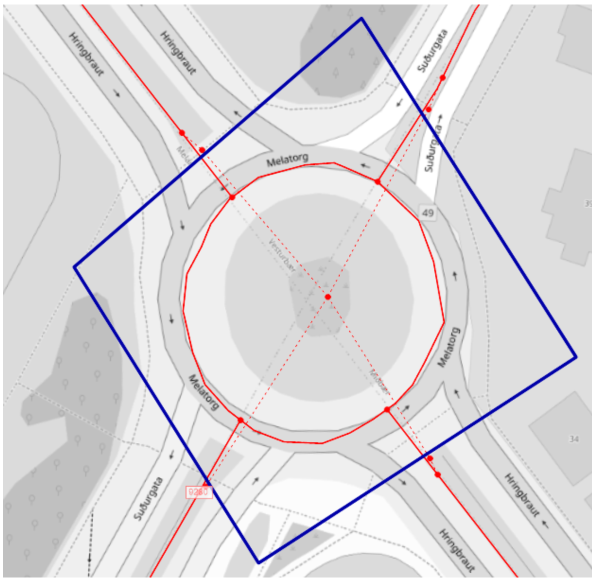



*Figure 11-8 Example of a roundabout changed to be intersection*


*Figure 11-9 Example of a double node when geometry is changed in an ICA node*

| Attribute name | | Description |
|---|---|---|
| Nodes | TypeNo | The Type number of nodes describes which kind of delays should be included in the model.<br>0: No delays<br>2: Nodes with traffic merging from two incoming links<br>4: Signal junction without ICA (not in use)<br>6: Roundabouts<br>7: Two-way yields intersection without ICA<br>14: Signal junction with ICA<br>17: Two-way yields intersection with ICA |
| | UseMethodImpAtNode | When the node type is 14 or 17, the "UsemethodImpAtNode" should be active. This field should be changed between different scenarios. If intersections should be changed to or from ICA nodes, new nodes need to be added to the model. This is referred to as double nodes, see section 11.2.3. |
| | New_project | If changes are made to the node, the "New_project" field should be checked |
| | SignalControl\Cycletime | The cycle time in the signal should be defined in seconds. The cycle time might vary between peak hours and off peak. Changes should be implemented in off peak, AM, PM1 and PM2 network |
| | SignalControl\New_project | If the node changes involve changes in signals, the SignalControl\New_project should be checked, see section 11.2.3 for more details on signal settings |
| Main Nodes | TypeNo | 6: Roundabouts.<br>All roundabouts are grouped into main nodes by selecting the area surrounding the roundabout. If any changes are required to existing roundabouts or if new roundabouts need to be added to the model network, the main node may only include the roundabout nodes not new nodes. If the roundabout should be replaced by a normal intersection, the existing roundabout nodes cannot be reused, but the existing access links should be split outside the main node borders, see section 11.2.3. |
| | New_project | If changes are made to the Main node, the "New_project" field should be checked |
| Main Turns | TSysSet | Defines the allowed vehicles in the turn movement. If the turn movement is closed for vehicles, it should be opened for busses anyhow. Busses are managed from the defined bus lines in the public transport model. |
| | New_project | If changes are made to the main turns, the "New_project" field should be checked |
| Links | TypeNo | Defines the link type. The model uses the link type settings from the link type table: Allowed speed, capacity, number of lanes etc.<br>If new parallel links are created due to e.g. double nodes (See section 11.2.3), the new links should have the suitable link number and the old parallel links should be closed (TypeNo=9) |
| | Buslane | Defines if the link includes a bus lane or not. The applied link type should have the same number of lanes as the number of links with car travel, i.e. the bus lane should not be considered as an active lane when setting the link type |
| | PathQuality | The Path Quality indicates the quality of bike paths:<br>1: Low quality bike lanes<br>2: Medium quality bike lanes<br>3 High quality bike lanes |

| | | |
|---|---|---|
| Links | Toll | The model is prepared for implementing future toll costs. If a link represents a toll road, the unit price of passing the link should be inserted into the Toll field in ISK |
| | New_project | If changes are made to the link, the "New_project" field should be checked |
| Turns | TypeNo | 1: Right turn<br>2: Straight<br>3: Left turn<br>4: U-turn |
| | TSysSet | Defines the allowed vehicles in the turn movement. If the turn movement is closed for vehicles, it should be opened for busses anyhow. Busses are managed from the defined bus lines in the public transport model. |
| | U-turn_allowed | If U-turns are allowed, this field should be active |
| | New_project | If changes are made to the turn movement, the "New_project" field should be checked |
| Connectors | TSysSet | Allowed vehicles on the connector.<br>Adding or changing connectors, should only be considered if new development areas are implemented i.e. new houses or workplaces. |
| | Weight (PrT) | The share of trips distributed from the model zone to the single connectors<br>Distribution shares should only be defined if the traffic in the model zone are defined to be distributed by shares. |
| | Weight (PuT) | The share of trips distributed from the model zone to the single connectors<br>Distribution shares should only be defined if the traffic in the model zone are defined to be distributed by shares. |
| | New_project | If changes are made to the connector, the "New_project" field should be checked |
| Zones | SharePrTOrig | The field need to be checked if the origin traffic should be distributed to the connectors by the specified shares |
| | SharePrTDest | The field need to be checked if the destination traffic should be distributed to the connectors by the specified shares |
| | SharePuT | The field need to be checked if the public transport trips should be distributed to the connectors by the specified shares |
| | MethodConnShares | The method for distributing the connector traffic if these are distributed by shares:<br>Default: is set to "Each Single OD pair"<br>Each Single OD pair: Distributes all OD trips to all connectors<br>Total Trips (MPA off): Distributes the trips with the most optimal OD relations to the different connectors. |
| | New_project | If changes are made to the zone settings, the "New_project" field should be checked |

*Table 11-1 Network elements possible to add or edit for the private transport and bike network*

Editing the public transport network is a little different. The public transport line variants are defined as routes on the existing road network. New or existing bus routes can be created and moved to other road sections by dragging the graphic representation of the route to the required road links. Editing line route allocations are completed from the "edit course" menu in Figure 11-10.

Timetables need to be created or updated for the changed or new bus routes. The timetables are created from the "Timetable (tabular)" menu in Figure 11-10. Run time, stop time and stop patterns can be edited from the "edit in new window" menu in Figure 11-10 or by double clicking at the line route in the Line route window.

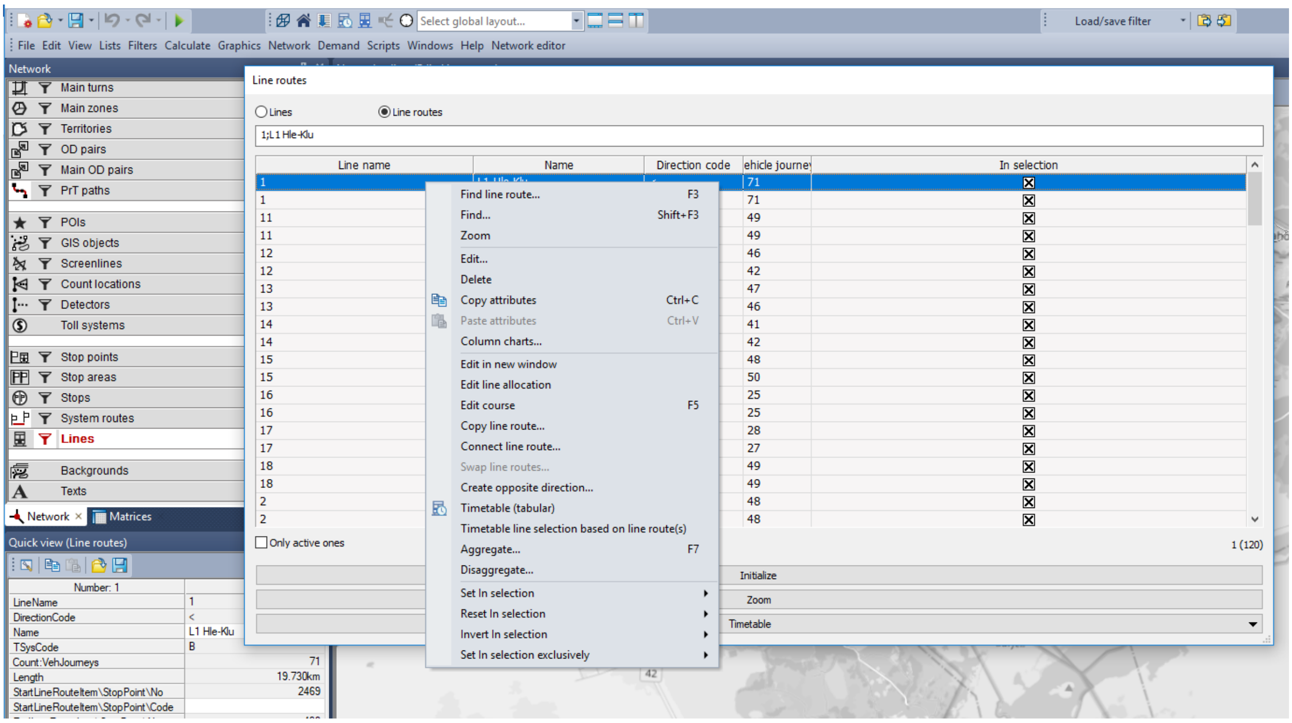



*Figure 11-10 Menus for public transport setting*

The public network is activated from user attributes defined for each single model forecast network, as illustrated in Figure 11-11. From the listing view of line routes, it is possible to get an overview of all the lines activated in the base scenario and the four forecast networks.

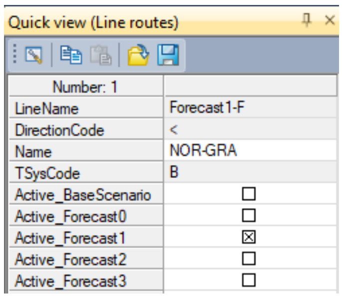



*Figure 11-11 Forecast settings for line routes*

The attributes to be considered for the public transport network are listed and described in Table 11-2.

| Attribute name | | Description |
|---|---|---|
| Line Routes | Active_BaseScenario | If the bus line is included in the base scenario, the Active_BaseScenario field should be checked |
| | Active_Forecast0 | If the bus line is included in forecast 0, the Active_Forecast0 field should be checked |
| | Active_Forecast1 | If the bus line is included in forecast 1, the Active_Forecast1 field should be checked |
| | Active_Forecast2 | If the bus line is included in forecast 2, the Active_Forecast2 field should be checked |
| | Active_Forecast3 | If the bus line is included in forecast 3, the Active_Forecast3 field should be checked |

*Table 11-2 Public transport network attributes*

### 11.2.3 Editing ICA nodes

In cases where the changes involve new ICA nodes or closing existing ICA nodes (Node type 14 and 17), node geometry and signal plans need to be added from the junction editor, see Figure 11-12 (Window opens when double clicking on the nodes).

In the Geometry menus "Legs", "Lanes", "Lane turns", the intersection geometry is de defined. The signal green times can be set in the "signal groups" menu or in the "signal timing" menu as illustrated in Figure 11-13. New signals can be created from the "create SC" signal icon .

When defining geometry in ICA nodes, it is important to make sure that there is only one turn type number 2 (straight). Otherwise the ICA calculations cannot be completed.

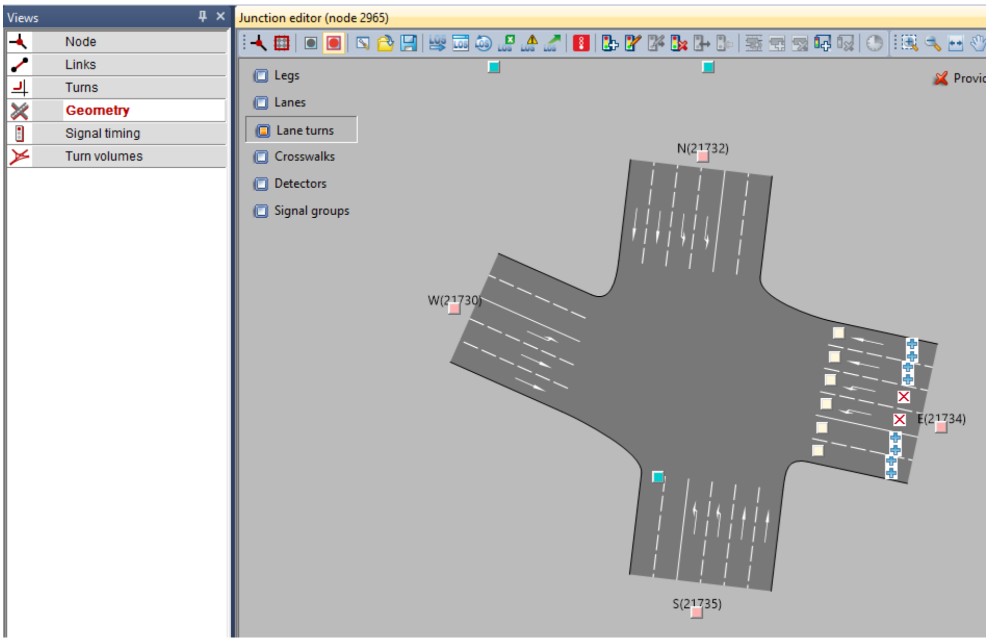



*Figure 11-12 Junction editor view*


*Figure 11-13 Signal timing settings.*

### 11.2.4 Saving network

When all the network changes are updated and new network elements are created, the changes should be saved via the "save scripts" as illustrated in Figure 11-14. The save scripts procedure should be completed after each network editing procedure before importing the next network. If some changes should be implemented in both Forecast 1 and Forecast 2, the network should be saved from both "Save – Forecast 1/Save Network (F1)" and "Save – Forecast 2/Save Network (F2)".

After saving the network from the script menu, the VISUM version should be saved before starting the model procedures from the user interface as described in section 11.3.

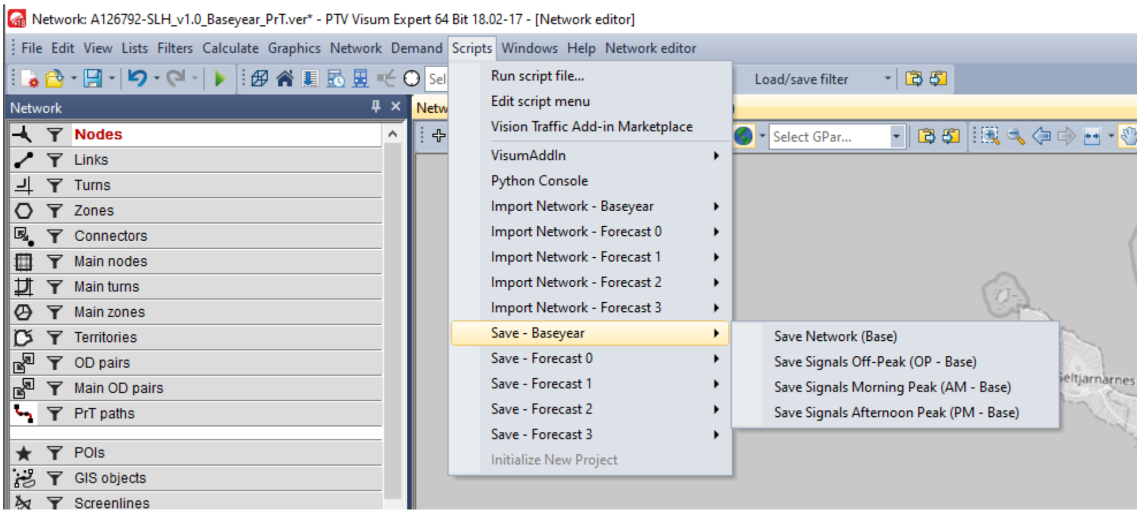



*Figure 11-14 Save script menus for base year, and each scenario*

## 11.3 Model User Interface

The overall model calculation procedures are managed from the customized user interface developed in Access (version 2007).

The user interface is placed in the VISUM_TOOLS_SLH folder together with the master VISUM Transport model file. The VISUM_TOOLS_SLH folder should be placed at the root of the local computer hard-drive C:\VISUM_TOOLS_SLH\.

When opening the user interface in Access, the calculation procedure is defined from the different drop-down menus as illustrated in Figure 11-15.

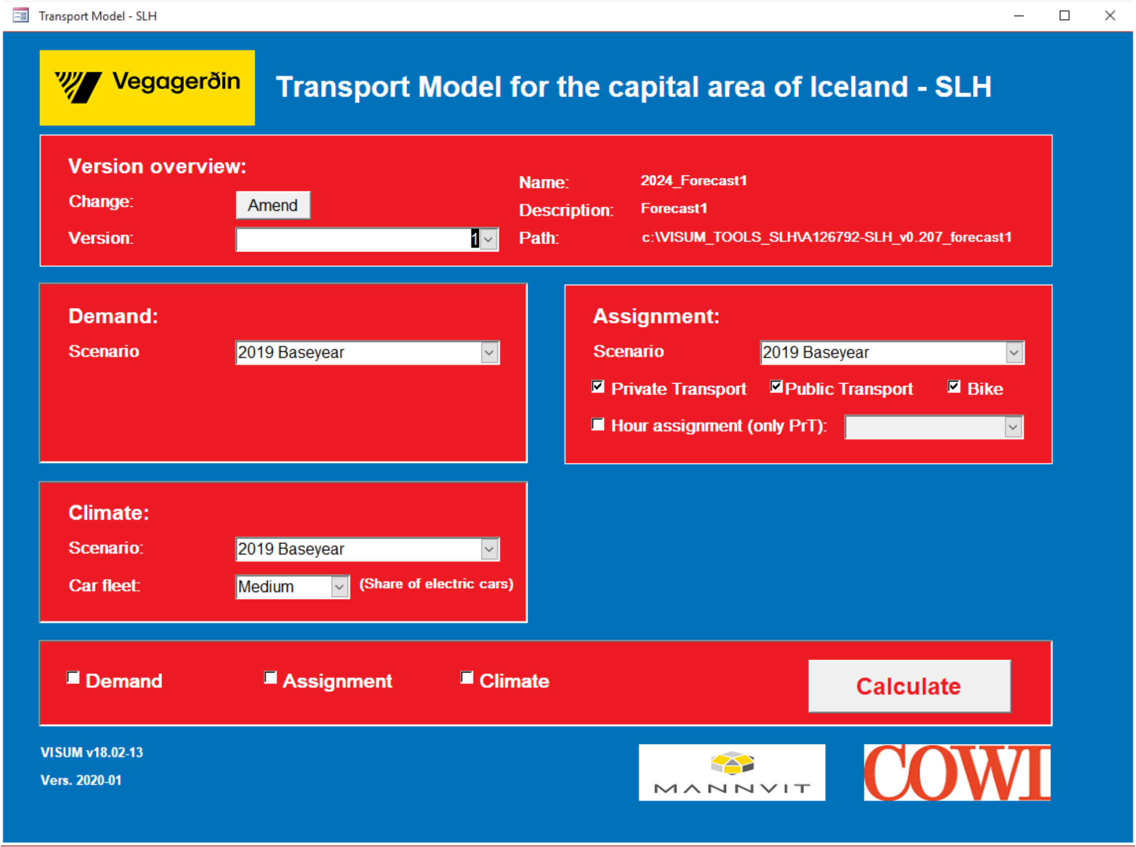



*Figure 11-15 Customized User Interface for SLH in Access*

The user interface communicates directly with VISUM, which opens and closes in the background when a calculation is made. Therefore, an active VISUM license (version 18) must be installed on the computer.

The user interface has combined the following features:

- Management of different VISUM versions (definition and description)
- Calculations of travel demand for the different transport modes
- Calculation of route choice and volumes on the network for the different transport modes (and time periods for Private Transport)
- Calculations of the climate module

# 12 Appendices

# Appendix A Travel survey analyses

The travel survey sample from 2017 includes 24,391 records, with 5,950 respondents. When applying person weights, 6% of the population has 0 travel activities during an average day. This is somewhat lower than what you see in e.g. the Danish travel survey. This might be cultural differences, or an uncertainty related to the survey and the limited sample size.

There are some registered travel activities without full travel information. There are travel activities without registered travel purpose, transport mode, or travel length. Other respondents have not registered all household details. The 290 observations without travel length are kept in the survey study as the most important information are registered for these travel activities.

Besides details of the travel activities, the respondents register some personal information, and some household information

## A.1 Trip rates

First of all, the travel frequencies are estimated for different population groups to outline how travel activities vary in the population. The trip rates in Table 12-1 shows how the trip rates varies between e.g. gender, age, and household type. The table also shows how detailed analyses are challenged from small sample sizes, when grouping the survey data into smaller population groups. The samples do however indicate which socio-economic factors influence travel activities.

Some of the trip rates listed in the table are most likely correlated. The 35-44 years olds travel more than the other age groups. This group of respondents are most likely also overrepresented in the single-family houses, the houses with more than one car, the high-income groups, and the households with more than two household members which are all person groups with the highest trip rates.

The overall trends illustrated in the table shows similar trends as seen in Danish and Norwegian travel surveys. Females tend to travel a little more than men, this is mainly related to household with children. People with car travel more than people without car. People in single-family houses travels more than people in multi-family houses. This is often related to higher income and higher share of families with children.

| Person category | Person group | Trip rates | Observations |
|---|---|---|---|
| Total | All | 4.1 | 5,950 |
| Gander | Male | 4.0 | 2,609 |
| | Female | 4.1 | 3,341 |
| Age | 6-12 years | 4.0 | 507 |
| | 13-17 years | 4.2 | 254 |
| | 18-24 years | 3.8 | 313 |
| | 25-34 years | 4.1 | 694 |
| | 35-44 years | 4.5 | 922 |
| Age | 45-54 years | 4.3 | 1,074 |
| | 55+ years | 3.7 | 2,186 |
| Car Ownership | 1 car | 4.1 | 2,407 |
| | 2 cars | 4.1 | 2,424 |
| | 3 cars | 4.2 | 674 |
| | 4 or more cars | 4.4 | 212 |
| | No cars | 3.4 | 200 |
| Car/No car | Car | 4.1 | 5,721 |
| | No Car | 3.4 | 200 |
| House type | Single-Family House | 4.2 | 2,320 |
| | Multi-Family House | 4.0 | 3,579 |
| Household size | 1 person | 3.5 | 726 |
| | 2 persons | 3.8 | 1,712 |
| | 3 persons | 4.0 | 1,078 |
| | 4 persons | 4.4 | 1,300 |
| | 5 or more persons | 4.4 | 1,104 |
| Income | <250.000 | 3.2 | 406 |
| | 250.000-399.999 | 3.6 | 466 |
| | 400.000-549.999 | 4.2 | 807 |
| | 550.000-799.999 | 4.1 | 744 |
| | 800.000-999.999 | 4.4 | 740 |
| | 1.000.000- | 4.3 | 1,266 |
| Area (PNR aggregated zones) | Zone 1 | 4.1 | 747 |
| | Zone 2 | 4.3 | 1,029 |
| | Zone 3 | 4.0 | 413 |
| | Zone 4 | 3.9 | 1,137 |
| | Zone 5 | 4.1 | 353 |
| | Zone 6 | 4.1 | 548 |
| | Zone 7 | 3.4 | 416 |
| | Zone 8 | 3.8 | 486 |
| | Zone 9 | 4.2 | 821 |

*Table 12-1 Trip rates per person group. The answers, "do not know" or "do not want to answer" are not included, hence the sum of observations is not the same for all categories.*

The postal zones of the travel survey are grouped into 9 zones as illustrated in Figure 12-1. The trip rates are estimated for these aggregated PNR zones to outline if there is any geographic variation. The trip rates vary from 3.4 to 4.3 but might be highly influenced by the small samples.

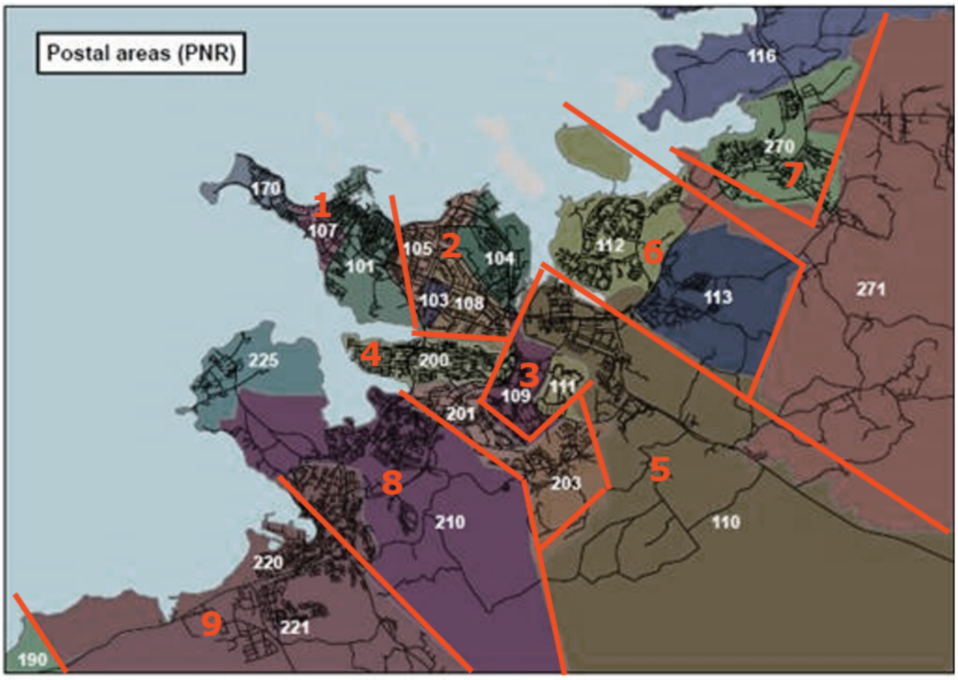



*Figure 12-1 9 aggregated postal zones (190 and 271 are not included)*

## A.2 Travel purpose

In the travel survey, there are registered nine different travel purposes, these are grouped into seven main travel purposes based on the characteristics of the purposes. Travelling to and from work are grouped into one work category. Pick up children, drive or pick up passenger, other purpose, e.g. visit bank, going home from other purposes than work, and other purposes are all grouped as errands due to their low trip rates.

An average traveller produces 4.05 trips per day, distributed on the seven travel purposes as listed in the table. As also

| Travel purpose | Trip rates | Share | Observations |
|---|---|---|---|
| Work | 1.04 | 26% | 6,631 |
| School | 0.29 | 7% | 1,178 |
| Shopping | 0.33 | 8% | 2,165 |
| Leisure | 0.56 | 14% | 3,218 |
| Business | 0.17 | 4% | 1,099 |
| Other (e.g. errands) | 1.65 | 41% | 9,662 |
| Total | 4.05 | 100% | 23,953 |

*Table 12-2 Trip rates per travel purpose*

It is furthermore analysed how the trip rates per travel purpose varies between e.g. car ownership, house types and number of persons in the households as illustrated in Figure 12-2 and listed in Table 12-3. The number of registered school trips and business trips are only around 1,000 and it is difficult to analyse variation in travel frequencies on smaller population samples, but the figure still illustrates some variation between the different population groups.

The trip rates show that it is in particular the number of errands that is higher for households with car compared to households without a car. The Sample of households without car is very small. The comparison furthermore show that the activity level is relatively equal whether the household has 1, 2 or 3 cars, but is a little higher for households with 4 or more cars. Work and Business travel seem to increase with the number of cars, but the samples are limited.

From the figure, it is obvious that the trip rates per person increases as the number of persons in the household increases. This is in particular the errands that increases from 1.2 to 1.9 trips per day. This is most likely highly correlated with the number of children in the household which is also present in the trip rates for school trips. The school trips are higher for persons living in household with 4 or more household members.

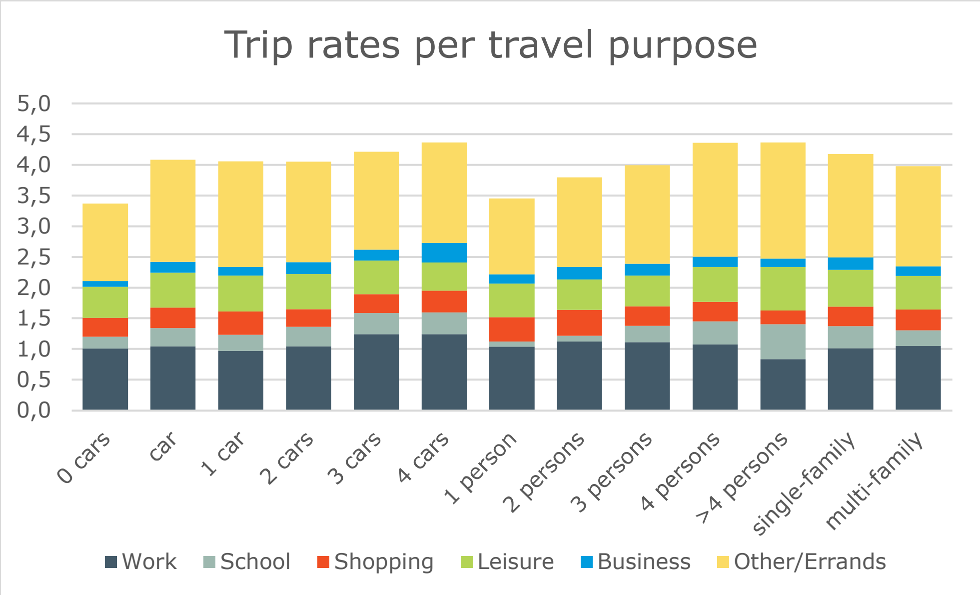



*Figure 12-2 Trip rates per transport purposes divided relative to car ownership, household size and household type*

| | 0 car | car | 1 car | 2 cars | 3 cars | 4 cars | 1 person | 2 persons | 3 persons | 4 persons | >4 persons | single-family | multi-family |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Work | 1.0 | 1.0 | 1.0 | 1.0 | 1.2 | 1.2 | 1.0 | 1.1 | 1.1 | 1.1 | 0.8 | 1.0 | 1.0 |
| School | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.1 | 0.1 | 0.3 | 0.4 | 0.6 | 0.4 | 0.3 |
| Shopping | 0.3 | 0.3 | 0.4 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 |
| Leisure | 0.5 | 0.6 | 0.6 | 0.6 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 0.7 | 0.6 | 0.5 |
| Business | 0.1 | 0.2 | 0.1 | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 |
| Other/Errands | 1.3 | 1.7 | 1.7 | 1.6 | 1.6 | 1.6 | 1.2 | 1.5 | 1.6 | 1.9 | 1.9 | 1.7 | 1.6 |
| Total | 3.4 | 4.1 | 4.1 | 4.1 | 4.2 | 4.4 | 3.5 | 3.8 | 4.0 | 4.4 | 4.4 | 4.2 | 4.0 |

*Table 12-3 Trip rates per travel purpose grouped into different population groups*

When estimating the distribution of trips on travel purposes, the errands represents 36-43% of the trips and working trips variates from 19-30% of all activities. The data sample is however too small to estimate trip rates sufficiently at this level of detail.

## A.3 Transport mode

The trip rates are estimated for the six transport modes as illustrated in Figure 12-3 and Table 12-4. It is obvious from the figure how dominating car is in Iceland. Even for persons living in a household without car, 15% of their trips are still as car driver. This can be car sharing, work related cars etc. From the figure it also appears that 46% of the trips from persons in household without car are walking trips and 15% are public transport, which are often short distance trips.

The figure also shows how travelling as car passenger increase as the number of household members increases. From the two household types, 62% of all trips are as car driver, 13-18% are as car passenger and 3-5% are public transport.

The overall mode share distribution of the registered travel activities is listed in Figure 12-5 with and without walking trips. When excluding the walking trips from the sample of travel activities, 71% of all travellers are car drivers, and 17% are car passengers. The remaining 12% are distributed with 7% bike trips and 5% Public transport trips.

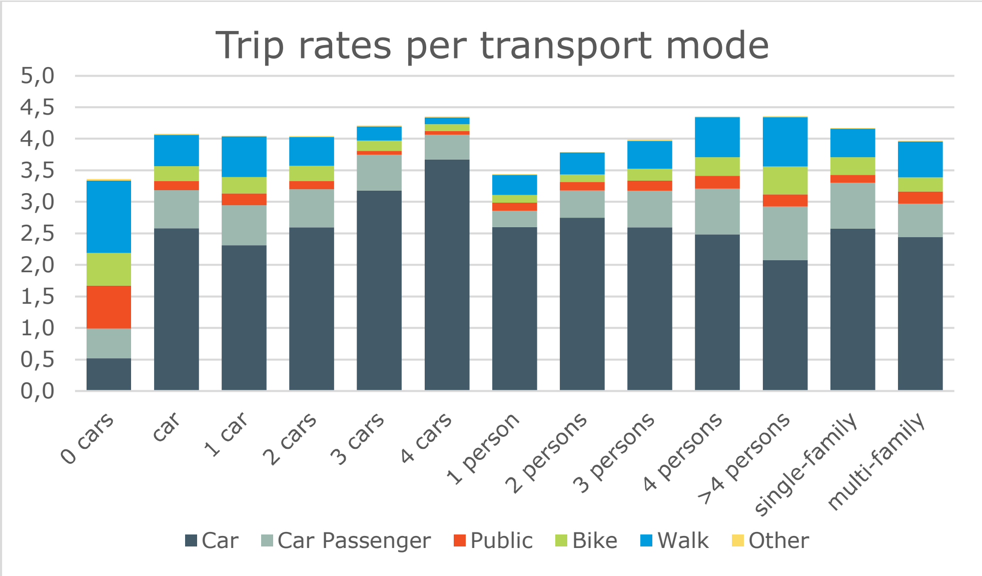



*Figure 12-3 Trip rates per transport mode divided relative to car ownership, household size and household type*

| | 0 car | car | 1 car | 2 cars | 3 cars | 4 cars | 1 person | 2 persons | 3 persons | 4 persons | >4 persons | single-family | multi-family |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Car | 0.5 | 2.6 | 2.3 | 2.6 | 3.2 | 3.7 | 2.6 | 2.7 | 2.6 | 2.5 | 2.1 | 2.6 | 2.4 |
| Car Passenger | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.4 | 0.3 | 0.4 | 0.6 | 0.7 | 0.8 | 0.7 | 0.5 |
| Public transport | 0.7 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 |
| Bike | 0.5 | 0.2 | 0.3 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.2 | 0.3 | 0.4 | 0.3 | 0.2 |
| Walk | 1.2 | 0.5 | 0.6 | 0.5 | 0.2 | 0.1 | 0.3 | 0.4 | 0.4 | 0.6 | 0.8 | 0.4 | 0.6 |
| Other modes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 3.4 | 4.1 | 4.1 | 4.1 | 4.2 | 4.4 | 3.5 | 3.8 | 4.0 | 4.4 | 4.4 | 4.2 | 4.0 |

*Table 12-4 Trip rates per transport mode grouped into different population groups*

| Transport Mode | Share of trips | Share of trips excl. Walk |
|---|---|---|
| Bike | 6.2% | 7.1% |
| Car Driver | 61.6% | 70.6% |
| Car Passenger | 15.1% | 17.4% |
| Other | 0.3% | 0.3% |
| Public Transport | 4.0% | 4.6% |
| Walk | 12.8% | - |
| Total | 100.0% | 100.0% |

*Table 12-5 Mode shares registered in the travel survey with and without walk trips*

## A.4 Travel time profiles

Figure 12-4 and Figure 12-5 illustrate the market share of travel activities for the different travel purposes and transport modes respective. Most trips are completed with less than 25 minutes travel time. Travel times seems to be a little higher for commuting and shortest for shopping and errands. When grouping into transport modes, the public transport activities have longer travel times with up till 60 minutes duration. Walk and bike activities have a bit lower travel time.

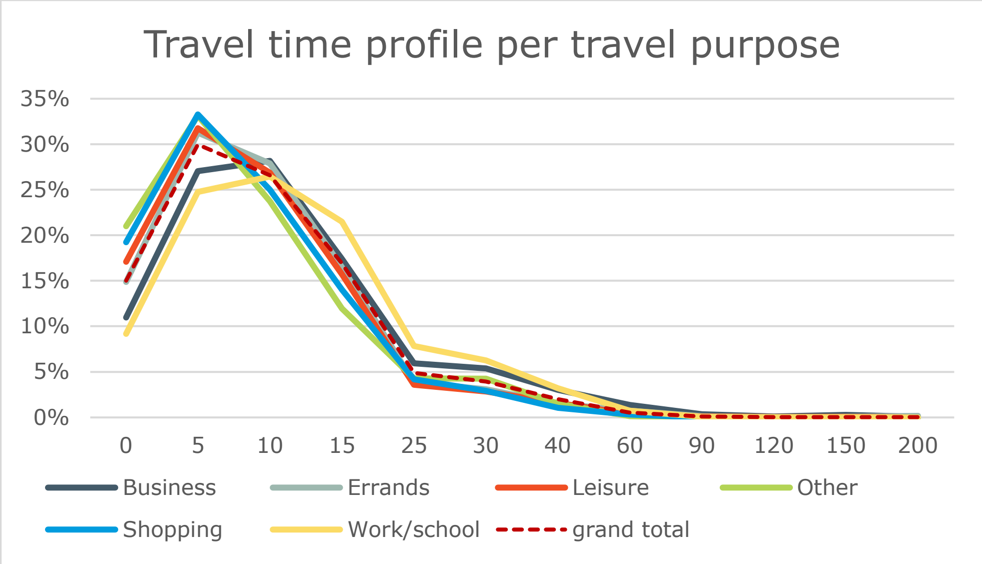



*Figure 12-4 Travel time profile per travel purpose*

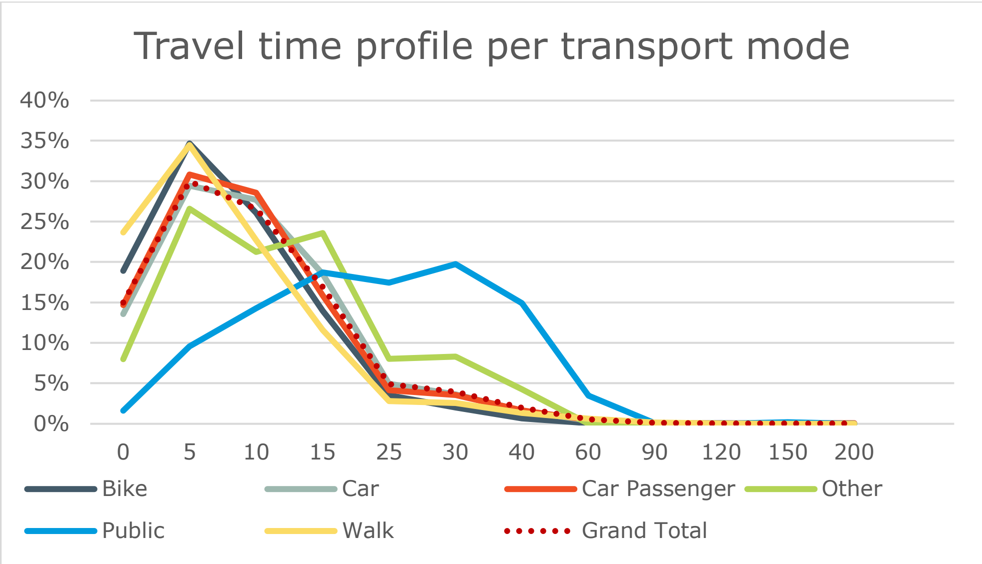



*Figure 12-5 Travel time profile per transport mode*

# Appendix B Zone data

| **User defined attributes** | **Description** |
|---|---|
| CHANGE | Changes made from LUKOR zones |
| TG_SingleFamily | Number of apartments (single-family house) |
| TG_Multifamily | Number of apartments (multi-family house) |
| TG_Schools | Number of students |
| TG_Workplace1 | Area ($m^2$) of high trip rate shopping and service workplaces (Gym, supermarket, hospital, swimming pool theatre) |
| TG_Workplace 2 | Area ($m^2$) of low trip rates shopping and service workplaces (hospital, coffee house, bank, bakery etc) |
| TG_Workplace 3 | Area ($m^2$) of light industry workplaces |
| TG_Workplace 4 | Area ($m^2$) of office and school workplaces |
| TG_Workplace 5 | Area ($m^2$) of storage and heavy industry workplaces |
| TG_Workplace 6 | Area ($m^2$) of specialized workplaces (church, prison, cemetery) |
| TG_Workplace 7 | Area ($m^2$) of buildings with very small trip rates (i.e. water tank) |
| Work_Place_Total | Total number of workplaces based on workplace area and average area per employee |
| WorkDensity | Total number of workplaces divided by zone area |
| Parking_Cost | Price per hour (ISK) |
| Parking_Paid_Share | Share of available free parking lots available for leisure and shopping purposes |
| P_Free | Number of free parking lots |
| P_Paid | Number of paid parking lots |

*Table 12-6 List of user defined attributes and descriptions in zones*

# Appendix C Link types

| Link Type | Name | Description | Rank | Allowed transport modes (TSysSet) | Number of lanes | Capacity (CapPrT) | Speed (V0PrT) |
|---|---|---|---|---|---|---|---|
| 0 | One way - Lokað | One-way road | 9 | B | 0 | 0 | 0 km/h |
| 1 | One way - Lokað but allowed for buses | One-way road but allowed for busses | 2 | B | 0 | 0 | 0 km/h |
| 2 | One way - Lokað but allowed for bikes and walk | One-way road but allowed for bike and walk | 2 | B, Bike, W | 1 | 1250 | 20 km/h |
| 3 | Roundabout -1 | Roundabout with one lane | 1 | B, Bike, Car, DT, HGV, W | 1 | 1250 | 30 km/h |
| 4 | Roundabout -2 | Roundabout with two lanes | 1 | B, Bike, Car, DT, HGV, W | 2 | 2200 | 30 km/h |
| 5 | One way - Lokað but allowed for walk | One way but allowed for walk | 9 | B, W | 0 | 0 | 0 km/h |
| 6 | Framhjahlaup | Shunt | 8 | B, Bike, Car, DT, HGV, W | 1 | 1750 | 30 km/h |
| 7 | Framhjahlaup m gangbr | Shunt with crosswalk | 8 | B, Bike, Car, DT, HGV, W | 1 | 1250 | 20 km/h |
| 8 | Framhjahlaup m gangbr -2 | Shunt with 2 lanes and crosswalk | 8 | B, Bike, Car, DT, HGV, W | 2 | 2000 | 20 km/h |
| 9 | Closed | Closed road | 9 | B | 1 | 1000 | 50 km/h |
| 10 | MS-1-90 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 1 | 2200 | 90 km/h |
| 11 | MS-1-50 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 1 | 2200 | 50 km/h |
| 12 | MS-1-80 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 1 | 2200 | 80 km/h |
| 13 | MS-1-70 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 1 | 2200 | 70 km/h |
| 14 | MS-1-60 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 1 | 2200 | 60 km/h |
| 15 | MS-2-90 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 2 | 4400 | 90 km/h |
| 16 | MS-2-80 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 2 | 4400 | 80 km/h |
| 17 | MS-2-70 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 2 | 4400 | 70 km/h |
| 18 | MS-2-60 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 2 | 4400 | 60 km/h |
| 19 | MS-2-50 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 2 | 4400 | 50 km/h |
| 20 | MS-3-90 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 3 | 6600 | 90 km/h |
| 21 | MS-3-80 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 3 | 6600 | 80 km/h |
| 22 | MS-3-60 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 3 | 6600 | 60 km/h |
| 25 | MS-4-90 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 4 | 8800 | 90 km/h |
| 26 | MS-4-80 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 4 | 8800 | 80 km/h |
| 27 | MS-4-70 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 4 | 8800 | 70 km/h |
| 28 | MS-4-60 | Grade separated highways | 1 | B, Bike, Car, DT, HGV, W | 4 | 8800 | 60 km/h |
| 29 | S-1-50 | Highways | 2 | B, Bike, Car, DT, HGV, W | 1 | 2200 | 50 km/h |
| 30 | S-1-60 | Highways | 2 | B, Bike, Car, DT, HGV, W | 1 | 2200 | 60 km/h |
| 31 | S-1-90 | Highways | 2 | B, Bike, Car, DT, HGV, W | 1 | 2200 | 90 km/h |
| 32 | S-1-80 | Highways | 2 | B, Bike, Car, DT, HGV, W | 1 | 2200 | 80 km/h |
| 33 | S-1-70 | Highways | 2 | B, Bike, Car, DT, HGV, W | 1 | 2200 | 70 km/h |
| 34 | S-2-90 | Highways | 2 | B, Bike, Car, DT, HGV, W | 2 | 4400 | 90 km/h |
| 35 | S-2-80 | Highways | 2 | B, Bike, Car, DT, HGV, W | 2 | 4400 | 80 km/h |
| 36 | S-2-70 | Highways | 2 | B, Bike, Car, DT, HGV, W | 2 | 4400 | 70 km/h |
| 37 | S-2-60 | Highways | 2 | B, Bike, Car, DT, HGV, W | 2 | 4400 | 60 km/h |
| 38 | S-2-50 | Highways | 2 | B, Bike, Car, DT, HGV, W | 2 | 4400 | 50 km/h |
| 39 | S-2-40 | Highways | 2 | B, Bike, Car, DT, HGV, W | 2 | 4400 | 40 km/h |
| 40 | S-2-30 | Highways | 2 | B, Bike, Car, DT, HGV, W | 2 | 4400 | 30 km/h |
| 41 | S-3-90 | Highways | 2 | B, Bike, Car, DT, HGV, W | 3 | 6600 | 90 km/h |
| 42 | S-3-80 | Highways | 2 | B, Bike, Car, DT, HGV, W | 3 | 6600 | 80 km/h |
| 44 | S-3-70 | Highways | 2 | B, Bike, Car, DT, HGV, W | 3 | 6600 | 70 km/h |
| 45 | S-3-60 | Highways | 2 | B, Bike, Car, DT, HGV, W | 3 | 6600 | 60 km/h |
| 46 | T-1-70 | Urban road class 1 | 3 | B, Bike, Car, DT, HGV, W | 1 | 1250 | 70 km/h |
| 47 | T-1-60 | Urban road class 1 | 3 | B, Bike, Car, DT, HGV, W | 1 | 1250 | 60 km/h |
| 48 | T-1-50 | Urban road class 1 | 3 | B, Bike, Car, DT, HGV, W | 1 | 1250 | 50 km/h |
| 49 | T-1-30 | Urban road class 1 | 3 | B, Bike, Car, DT, HGV, W | 1 | 1250 | 30 km/h |
| 50 | T-2-70 | Urban road class 1 | 3 | B, Bike, Car, DT, HGV, W | 2 | 2500 | 70 km/h |
| 54 | T-2-60 | Urban road class 1 | 3 | B, Bike, Car, DT, HGV, W | 2 | 2500 | 60 km/h |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 55 | T-2-50 | Urban road class 1 | 3 | B, Bike, Car, DT, HGV, W | 2 | 2500 | 50 km/h |
| 56 | T-2-30 | Urban road class 1 | 3 | B, Bike, Car, DT, HGV, W | 2 | 2500 | 30 km/h |
| 58 | T-3-60 | Urban road class 1 | 3 | B, Bike, Car, DT, HGV, W | 3 | 3750 | 60 km/h |
| 59 | T-3-50 | Urban road class 1 | 3 | B, Bike, Car, DT, HGV, W | 3 | 3750 | 50 km/h |
| 60 | Sa-1-60 | Urban road class 2 | 4 | B, Bike, Car, DT, HGV, W | 1 | 1250 | 60 km/h |
| 61 | Sa-1-50 | Urban road class 2 | 4 | B, Bike, Car, DT, HGV, W | 1 | 1250 | 50 km/h |
| 62 | Sa-1-30 | Urban road class 2 | 4 | B, Bike, Car, DT, HGV, W | 1 | 1250 | 30 km/h |
| 63 | Sa-1-40 | Urban road class 2 | 4 | B, Bike, Car, DT, HGV, W | 1 | 1250 | 40 km/h |
| 64 | Sa-2-50 | Urban road class 2 | 4 | B, Bike, Car, DT, HGV, W | 2 | 2500 | 50 km/h |
| 65 | Sa-2-30 | Urban road class 2 | 4 | B, Bike, Car, DT, HGV, W | 2 | 2500 | 30 km/h |
| 66 | Sa-2-60 | Urban road class 2 | 4 | B, Bike, Car, DT, HGV, W | 2 | 2500 | 60 km/h |
| 71 | H-1-50 | Urban road class 3 | 5 | B, Bike, Car, DT, HGV, W | 1 | 800 | 50 km/h |
| 72 | H-1-30 | Urban road class 3 | 5 | B, Bike, Car, DT, HGV, W | 1 | 800 | 30 km/h |
| 73 | H-1-15 | Urban road class 3 | 5 | B, Bike, Car, DT, HGV, W | 1 | 800 | 15 km/h |
| 80 | Bike path (dedicated lanes) | Bike path best quality | 6 | B, Bike, W | 1 | 1000 | 20 km/h |
| 81 | Bike path (Mixed ped/bike) | Bike path medium quality | 6 | B, Bike, W | 1 | 1000 | 20 km/h |
| 82 | Bike path (low quality) | Dirt path | 6 | B, Bike, W | 1 | 1000 | 20 km/h |
| 83 | Pedestrian street | Pedestrian street | 6 | B, Bike, W | 1 | 1000 | 5 km/h |
| 85 | Bus street | Bus street | 6 | B, Bike, W | 1 | 1000 | 50 km/h |
| 110 | MS-1-90 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 1 | 2200 | 90 km/h |
| 111 | MS-1-50 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 1 | 2200 | 50 km/h |
| 112 | MS-1-80 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 1 | 2200 | 80 km/h |
| 113 | MS-1-70 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 1 | 2200 | 70 km/h |
| 114 | MS-1-60 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 1 | 2200 | 60 km/h |
| 115 | MS-2-90 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 2 | 4400 | 90 km/h |
| 116 | MS-2-80 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 2 | 4400 | 80 km/h |
| 117 | MS-2-70 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 2 | 4400 | 70 km/h |
| 118 | MS-2-60 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 2 | 4400 | 60 km/h |
| 119 | MS-2-50 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 2 | 4400 | 50 km/h |
| 120 | MS-3-90 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 3 | 6600 | 90 km/h |
| 121 | MS-3-80 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 3 | 6600 | 80 km/h |
| 122 | MS-3-60 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 3 | 6600 | 60 km/h |
| 123 | Ramp -1 | Ramp one lane | 8 | B, Car, DT, HGV, W | 1 | 1750 | 50 km/h |
| 125 | MS-4-90 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 4 | 8800 | 90 km/h |
| 126 | MS-4-80 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 4 | 8800 | 80 km/h |
| 127 | MS-4-70 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 4 | 8800 | 70 km/h |
| 128 | MS-4-60 excl. bike | Grade separated highways excl. Bike | 1 | B, Car, DT, HGV, W | 4 | 8800 | 60 km/h |
| 129 | S-1-50 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 1 | 2200 | 50 km/h |
| 130 | S-1-60 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 1 | 2200 | 60 km/h |
| 131 | S-1-90 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 1 | 2200 | 90 km/h |
| 132 | S-1-80 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 1 | 2200 | 80 km/h |
| 133 | S-1-70 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 1 | 2200 | 70 km/h |
| 134 | S-2-90 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 2 | 4400 | 90 km/h |
| 135 | S-2-80 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 2 | 4400 | 80 km/h |
| 136 | S-2-70 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 2 | 4400 | 70 km/h |
| 137 | S-2-60 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 2 | 4400 | 60 km/h |
| 138 | S-2-50 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 2 | 4400 | 50 km/h |
| 139 | S-2-40 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 2 | 4400 | 40 km/h |
| 140 | S-2-30 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 2 | 4400 | 30 km/h |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 141 | S-3-90 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 3 | 6600 | 90 km/h |
| 142 | S-3-80 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 3 | 6600 | 80 km/h |
| 144 | S-3-70 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 3 | 6600 | 70 km/h |
| 145 | S-3-60 excl. bike | Highways excl. bike | 2 | B, Car, DT, HGV, W | 3 | 6600 | 60 km/h |
| 146 | T-1-70 excl. bike | Urban road class 1 excl. Bike | 3 | B, Car, DT, HGV, W | 1 | 1250 | 70 km/h |
| 147 | T-1-60 excl. bike | Urban road class 1 excl. Bike | 3 | B, Car, DT, HGV, W | 1 | 1250 | 60 km/h |
| 148 | T-1-50 excl. bike | Urban road class 1 excl. Bike | 3 | B, Car, DT, HGV, W | 1 | 1250 | 50 km/h |
| 149 | T-1-30 excl. bike | Urban road class 1 excl. Bike | 3 | B, Car, DT, HGV, W | 1 | 1250 | 30 km/h |
| 150 | T-2-70 excl. bike | Urban road class 1 excl. Bike | 3 | B, Car, DT, HGV, W | 2 | 2500 | 70 km/h |
| 154 | T-2-60 excl. bike | Urban road class 1 excl. Bike | 3 | B, Car, DT, HGV, W | 2 | 2500 | 60 km/h |
| 155 | T-2-50 excl. bike | Urban road class 1 excl. Bike | 3 | B, Car, DT, HGV, W | 2 | 2500 | 50 km/h |
| 156 | T-2-30 excl. bike | Urban road class 1 excl. Bike | 3 | B, Car, DT, HGV, W | 2 | 2500 | 30 km/h |
| 158 | T-3-60 excl. bike | Urban road class 1 excl. Bike | 3 | B, Car, DT, HGV, W | 3 | 3750 | 60 km/h |
| 159 | T-3-50 excl. bike | Urban road class 1 excl. Bike | 3 | B, Car, DT, HGV, W | 3 | 3750 | 50 km/h |
| 160 | Sa-1-60 excl. bike | Urban road class 2 excl. Bike | 4 | B, Car, DT, HGV, W | 1 | 1250 | 60 km/h |
| 161 | Sa-1-50 excl. bike | Urban road class 2 excl. Bike | 4 | B, Car, DT, HGV, W | 1 | 1250 | 50 km/h |
| 162 | Sa-1-30 excl. bike | Urban road class 2 excl. Bike | 4 | B, Car, DT, HGV, W | 1 | 1250 | 30 km/h |
| 163 | Sa-1-40 excl. bike | Urban road class 2 excl. Bike | 4 | B, Car, DT, HGV, W | 1 | 1250 | 40 km/h |
| 164 | Sa-2-50 excl. bike | Urban road class 2 excl. Bike | 4 | B, Car, DT, HGV, W | 2 | 2500 | 50 km/h |
| 165 | Sa-2-30 excl. bike | Urban road class 2 excl. Bike | 4 | B, Car, DT, HGV, W | 2 | 2500 | 30 km/h |
| 166 | Sa-2-60 excl. bike | Urban road class 2 excl. Bike | 4 | B, Car, DT, HGV, W | 2 | 2500 | 60 km/h |
| 171 | H-1-50 excl. bike | Urban road class 3 excl. Bike | 5 | B, Car, DT, HGV, W | 1 | 800 | 50 km/h |
| 172 | H-1-30 excl. bike | Urban road class 3 excl. Bike | 5 | B, Car, DT, HGV, W | 1 | 800 | 30 km/h |
| 173 | H-1-15 excl. bike | Urban road class 3 excl. Bike | 5 | B, Car, DT, HGV, W | 1 | 800 | 15 km/h |

*Table 12-7 Link types used in SLH. For allowed vehicles, Car, DT and HGV include represents the peak hour and off peak transport modes: C-off-peak,C-rush-AM,C-rush-PM1,C-rush-PM2,DT-off-peak,DT-rush-AM,DT-rush-PM1,DT-rush-PM2,HGV-off-peak,HGV-rush-AM,HGV-rush-PM1,HGV-rush-PM2 in the model*

# Appendix D Public transport network 2019

Bus network in the base year model is based on GTFS extraction done by Strætó in February 2019 maps

| Bus number | Route Name | Number of line variants |
|---|---|---|
| 1 | Hlemmur-Klukkuvellir | 2 |
| 2 | Hlemmur-Mjódd | 2 |
| 3 | Hlemmur-Mjódd | 2 |
| 4 | Hlemmur-Mjódd | 2 |
| 5 | Norðlingaholt-Nauthóll | 2 |
| 6 | Hlemmur-Spöng | 2 |
| 7 | Leirvogstunga-Spöng | 2 |
| 11 | Eiðsgrandi-Mjódd | 2 |
| 12 | Ártún-Skerjafjörður | 2 |
| 13 | Eiðsgrandi-Sléttuvegur | 2 |
| 14 | Verzló-Grandi | 2 |
| 15 | Mosfellsbær-Vesrsló | 2 |
| 16 | Árbær-Hlemmur | 2 |
| 17 | Berg-Hlemmur | 2 |
| 18 | Hlemmur-Spöngin | 2 |
| 21 | Fjörður-Mjódd | 2 |
| 22 | Fjörður-Hraun | 2 |
| 23 | Ásgarður-Álftanes | 2 |
| 24 | Spöng-Ásggarður | 2 |
| 27 | Háholt-Háholt | 1 |
| 28 | Dalaþing-Hamraborg | 2 |
| 29 | Háholt-Esjan | 2 |
| 31 | Gufunesbær-Egilshöll | 2 |
| 33-34 | Fjörður - Fjörður | 2 |
| 35-36 | Ham-Ham | 2 |
| 43-44 | Fjö-Fjö | 2 |
| 51_52 | Mjódd-Selffoss | 2 |
| 51_52 | Umferðarmiðstöðin (BSÍ)-Selffoss | 1 |
| 55 | Keflavík-Fjörður | 2 |
| 55 | Keflavík-Umferðarmiðstöðin (BSÍ) | 2 |
| 57 | Borgarnes-Mjódd | 2 |
| 57 | Umferðarmiðstöðin (BSÍ)-Akratorg | 1 |

*Table 12-8 Implemented base year bus routes*


*Figure 12-6 Bus route map used in the base year model*

**1: Hlemmur → Klukkuvellir**

Mánudaga-föstudaga / Mondays-Fridays

| | | | 6:44-9:04 Mín. yfir klst. | | | | | | 9:12-13:57 Mín. yfir klst. | | | | 14:12-18:02 Mín. yfir klst. | | | | | | 18:13-23:43 Mín. yfir klst. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hlemmur** | .... | .... | 04 | 14 | 24 | 34 | 44 | 54 | 12 | 27 | 42 | 57 | 02 | 12 | 22 | 32 | 42 | 52 | 13 | 43 | 00:13 |
| Barónsstígur | .... | .... | 05 | 15 | 25 | 35 | 45 | 55 | 13 | 28 | 43 | 58 | 03 | 13 | 23 | 33 | 43 | 53 | 14 | 44 | 00:14 |
| Bíó Paradís | .... | .... | 06 | 16 | 26 | 36 | 46 | 56 | 14 | 29 | 44 | 59 | 04 | 14 | 24 | 34 | 44 | 54 | 15 | 45 | 00:15 |
| Þjóðleikhúsið | .... | .... | 07 | 17 | 27 | 37 | 47 | 57 | 15 | 30 | 45 | 00 | 05 | 15 | 25 | 35 | 45 | 55 | 16 | 46 | 00:16 |
| Lækjartorg | .... | .... | 09 | 19 | 29 | 39 | 49 | 59 | 17 | 32 | 47 | 02 | 07 | 17 | 27 | 37 | 47 | 57 | 18 | 48 | 00:18 |
| Ráðhúsið | .... | .... | 10 | 20 | 30 | 40 | 50 | 00 | 18 | 33 | 48 | 03 | 08 | 18 | 28 | 38 | 48 | 58 | 19 | 49 | 00:19 |
| Háskóli Islands | .... | .... | 12 | 22 | 32 | 42 | 52 | 02 | 20 | 35 | 50 | 05 | 10 | 20 | 30 | 40 | 50 | 00 | 21 | 51 | 00:21 |
| BSÍ / Landspítalinn | .... | .... | 14 | 24 | 34 | 44 | 54 | 04 | 22 | 37 | 52 | 07 | 12 | 22 | 32 | 42 | 52 | 02 | 23 | 53 | 00:23 |
| Klambratún | .... | .... | 17 | 27 | 37 | 47 | 57 | 07 | 25 | 40 | 55 | 10 | 15 | 25 | 35 | 45 | 55 | 05 | 26 | 56 | 00:26 |
| Hlíðar | .... | .... | 19 | 29 | 39 | 49 | 59 | 09 | 27 | 42 | 57 | 12 | 17 | 27 | 37 | 47 | 57 | 07 | 27 | 57 | 00:27 |
| Kringlumýrarbraut / Kringlan | .... | .... | 21 | 31 | 41 | 51 | 01 | 11 | 29 | 44 | 59 | 14 | 19 | 29 | 39 | 49 | 59 | 09 | 29 | 59 | 00:29 |
| **Hamraborg** | .... | .... | 26 | 36 | 46 | 56 | 06 | 16 | 34 | 49 | 04 | 19 | 26 | 36 | 46 | 56 | 06 | 16 | 34 | 04 | **00:34** |
| **Hamraborg** | **6:36** | **6:51** | 26 | 36 | 46 | 56 | 06 | 16 | 36 | 51 | 06 | 21 | 26 | 36 | 46 | 56 | 06 | 16 | 36 | 06 | **00:34** |
| Sunnuhlíð | 6:36 | 6:51 | 26 | 36 | 46 | 56 | 06 | 16 | 36 | 51 | 06 | 21 | 26 | 36 | 46 | 56 | 06 | 16 | 36 | 06 | 00:34 |
| Arnarneshæð | 6:38 | 6:53 | 28 | 38 | 48 | 58 | 08 | 18 | 38 | 53 | 08 | 23 | 28 | 38 | 48 | 58 | 08 | 18 | 38 | 08 | 00:36 |
| Hegranes | 6:39 | 6:54 | 29 | 39 | 49 | 59 | 09 | 19 | 39 | 54 | 09 | 24 | 29 | 39 | 49 | 59 | 09 | 19 | 38 | 08 | 00:36 |
| Hafnarfjarðarvegur / Ásgarður | 6:41 | 6:56 | 31 | 41 | 51 | 01 | 11 | 21 | 41 | 56 | 11 | 26 | 31 | 41 | 51 | 01 | 11 | 21 | 40 | 10 | 00:38 |
| Asar | 6:42 | 6:57 | 32 | 42 | 52 | 02 | 12 | 22 | 42 | 57 | 12 | 27 | 32 | 42 | 52 | 02 | 12 | 22 | 40 | 10 | 00:39 |
| Hjallabraut | 6:44 | 6:59 | 34 | 44 | 54 | 04 | 14 | 24 | 44 | 59 | 14 | 29 | 34 | 44 | 54 | 04 | 14 | 24 | 42 | 12 | 00:41 |
| Hraunbrún | 6:45 | 7:00 | 35 | 45 | 55 | 05 | 15 | 25 | 45 | 00 | 15 | 30 | 35 | 45 | 55 | 05 | 15 | 25 | 43 | 13 | 00:42 |
| Hellisgerði | 6:46 | 7:01 | 36 | 46 | 56 | 06 | 16 | 26 | 46 | 01 | 16 | 31 | 36 | 46 | 56 | 06 | 16 | 26 | 43 | 13 | 00:42 |
| **Fjörður** | **6:48** | **7:03** | 38 | 48 | 58 | 08 | 18 | 28 | 48 | 03 | 18 | 33 | 40 | 50 | 00 | 10 | 20 | 30 | 45 | 15 | **00:44** |
| **Fjörður** | **6:51** | **7:06** | 38 | 48 | 58 | 08 | 18 | 28 | 51 | 06 | 21 | 36 | 40 | 50 | 00 | 10 | 20 | 30 | 48 | 18 | **00:44** |
| Lækjargata | 6:53 | 7:08 | 40 | 50 | 00 | 10 | 20 | 30 | 53 | 08 | 23 | 38 | 42 | 52 | 02 | 12 | 22 | 32 | 50 | 20 | 00:46 |
| Grænakinn | 6:54 | 7:09 | 41 | 51 | 01 | 11 | 21 | 31 | 54 | 09 | 24 | 39 | 43 | 53 | 03 | 13 | 23 | 33 | 50 | 20 | 00:46 |
| Flensborg | 6:55 | 7:10 | 42 | 52 | 02 | 12 | 22 | 32 | 55 | 10 | 25 | 40 | 44 | 54 | 04 | 14 | 24 | 34 | 51 | 21 | 00:47 |
| Hlíðarbraut | 6:56 | 7:11 | 43 | 53 | 03 | 13 | 23 | 33 | 56 | 11 | 26 | 41 | 45 | 55 | 05 | 15 | 25 | 35 | 52 | 22 | 00:48 |
| Suðurbæjarlaug | 6:57 | 7:12 | 44 | 54 | 04 | 14 | 24 | 34 | 57 | 12 | 27 | 42 | 46 | 56 | 06 | 16 | 26 | 36 | 53 | 23 | 00:49 |
| Kelduhvammur | 6:58 | 7:13 | 45 | 55 | 05 | 15 | 25 | 35 | 58 | 13 | 28 | 43 | 47 | 57 | 07 | 17 | 27 | 37 | 54 | 24 | 00:50 |
| Haukahús | 6:59 | 7:14 | 46 | 56 | 06 | 16 | 26 | 36 | 59 | 14 | 29 | 44 | 48 | 58 | 08 | 18 | 28 | 38 | 55 | 25 | 00:51 |
| Ásvallalaug | 6:59 | 7:14 | 46 | 56 | 06 | 16 | 26 | 36 | 59 | 14 | 29 | 44 | 48 | 58 | 08 | 18 | 28 | 38 | 55 | 25 | 00:51 |
| Kirkjutorg | 7:00 | 7:15 | 47 | 57 | 07 | 17 | 27 | 37 | 00 | 15 | 30 | 45 | 49 | 59 | 09 | 19 | 29 | 39 | 56 | 26 | 00:52 |
| Kirkjuvellir | 7:00 | 7:15 | 47 | 57 | 07 | 17 | 27 | 37 | 00 | 15 | 30 | 45 | 49 | 59 | 09 | 19 | 29 | 39 | 56 | 26 | 00:52 |
| Akurvellir | 7:01 | 7:16 | 48 | 58 | 08 | 18 | 28 | 38 | 01 | 16 | 31 | 46 | 50 | 00 | 10 | 20 | 30 | 40 | 57 | 27 | 00:53 |
| Daggarvellir | 7:02 | 7:17 | 49 | 59 | 09 | 19 | 29 | 39 | 02 | 17 | 32 | 47 | 51 | 01 | 11 | 21 | 31 | 41 | 58 | 28 | 00:54 |
| Hraunvallaskóli | 7:03 | 7:18 | 50 | 00 | 10 | 20 | 30 | 40 | 03 | 18 | 33 | 48 | 52 | 02 | 12 | 22 | 32 | 42 | 59 | 29 | 00:55 |
| Hvannavellir | 7:04 | 7:19 | 51 | 01 | 11 | 21 | 31 | 41 | 04 | 19 | 34 | 49 | 53 | 03 | 13 | 23 | 33 | 43 | 00 | 30 | 00:56 |
| Glitvellir | 7:04 | 7:19 | 51 | 01 | 11 | 21 | 31 | 41 | 04 | 19 | 34 | 49 | 53 | 03 | 13 | 23 | 33 | 43 | 00 | 30 | 00:56 |
| Hnoðravellir | 7:05 | 7:20 | 52 | 02 | 12 | 22 | 32 | 42 | 05 | 20 | 35 | 50 | 54 | 04 | 14 | 24 | 34 | 44 | 01 | 31 | 00:57 |
| **Klukkuvellir** | **7:07** | **7:22** | 54 | 04 | 14 | 24 | 34 | 44 | 07 | 22 | 37 | 52 | 56 | 06 | 16 | 26 | 36 | 46 | 02 | 32 | **00:58** |

*Figure 11-9 Example of the timetable for line 1 (Hlemmur-Klukkuvellir)*

# Appendix E Public transport prices

| Type of fare | Price | | Share of tickets |
|---|---|---|---|
| General fare | 470 kr | | 31% |
| Discount fare (elderly, children, teenagers and disabled) | 235 kr | | Included in above (can't be separated) |
| Night fare | 940 kr | | 0% |
| Period cards | Price | Price per month | Share of tickets |
| 1 Month | 12.800 kr | 12.800 kr | 4% |
| 2 Month | 20.480 kr | 10.240 kr | 2% |
| 3 Month | 27.950 kr | 9.317 kr | 1% |
| 4 Month | 34.350 kr | 8.588 kr | 1% |
| 5 Month | 40.750 kr | 8.150 kr | 1% |
| 6 Month | 47.150 kr | 7.858 kr | 1% |
| 7 Month | 53.550 kr | 7.650 kr | 1% |
| 8 Month | 59.950 kr | 7.494 kr | 1% |
| 9 Month | 66.400 kr | 7.378 kr | 1% |
| 10 Month | 69.550 kr | 6.955 kr | 1% |
| 11 Month | 72.800 kr | 6.618 kr | 1% |
| 12 Month | 74.800 kr | 6.234 kr | 1% |
| App subscription | 12.800 kr | 8.533 kr | 14% |
| One day card | 1.800 kr | - | 0% |
| Three day card | 4.200 kr | - | 0% |
| Discount cards | Prise | Price per month | Share of tickets |
| 6 months student card +18 years | 29.700 kr | 4.950 kr | 3% |
| 12 months +18 year (student card) | 52.900 kr | 4.408 kr | 5% |
| 12 months 12-17 year (youth card) | 22.600 kr | 1.883 kr | 8% |
| 12 months 6-11 year (children card) | 8.900 kr | 742 kr | 1% |
| Premium card | 66.400 kr | 5.533 kr | 6% |
| 12 months elderly and disabled | 22.600 kr | 1.883 kr | 1% |
| Tickets | 20 tickets | Ticket | Share of tickets |
| Adults | 9.100 kr | 455 kr | 10% |
| Teenagers 12-17 year | 3.300 kr | 165 kr | 5% |
| Children 6-11 years | 1.420 kr | 71 kr | 1% |
| Elderly and disabled | 2.900 kr | 145 kr | 4% |

*Table 12-9 Fare breakdown delivered by Strætó (ISK)*

# Appendix F Land use values 2019

| NAME | Zone number | Single family house | Multi family apartments | Schools | Shopping and service (high trip rates) | Shopping and service (low trip rates) | Light industry | Office and Schools | Storage and heavy industry | Specialized (church, prison, cemetery) | Single family house |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Seltjarnarnes - | 1 | 506 | 602 | 0 | 5,008 | 1310 | 0 | 14,523 | 5683 | 1487 | 0 |
| Seltjarnarnes - | 2 | 227 | 376 | 0 | 5,452 | 315 | 0 | 2,538 | 1751 | 0 | 0 |
| Eiðsgrandi | 3 | 39 | 565 | 0 | 0 | 0 | 0 | 5,224 | 0 | 0 | 0 |
| Skjólin | 4 | 152 | 492 | 0 | 1,236 | 514 | 0 | 6,150 | 136 | 9 | 0 |
| Bráðræðisholt | 5 | 61 | 1,049 | 0 | 4,048 | 192 | 0 | 4,923 | 0 | 66 | 1072 |
| Melarnir | 6 | 30 | 1,010 | 0 | 1,457 | 233 | 0 | 11,829 | 92 | 0 | 0 |
| Hagarnir | 7 | 55 | 860 | 0 | 2,423 | 94 | 0 | 11,776 | 0 | 0 | 0 |
| Hagar/stofnanir | 8 | 0 | 0 | 5,500 | 6,874 | 397 | 0 | 44,700 | 0 | 1118 | 0 |
| Litli Skerjafj. | 9 | 56 | 665 | 0 | 688 | 0 | 0 | 2,717 | 0 | 0 | 0 |
| Háskólinn | 10 | 0 | 0 | 5,500 | 0 | 0 | 0 | 33,849 | 0 | 4548 | 0 |
| Njarðargata | 11 | 0 | 0 | 0 | 0 | 0 | 1235 | 1,243 | 11921 | 0 | 55 |
| Skerjafjörður | 12 | 156 | 106 | 150 | 104 | 0 | 0 | 962 | 2530 | 54 | 0 |
| Mýrargata | 13 | 29 | 123 | 0 | 4,571 | 141 | 0 | 8,963 | 4473 | 0 | 0 |
| Framnesvegur | 14 | 37 | 449 | 0 | 2,059 | 99 | 0 | 8,406 | 1063 | 0 | 0 |
| Bræðrab.stígur | 15 | 49 | 297 | 0 | 429 | 0 | 0 | 919 | 425 | 10 | 0 |
| Bræðrab.stígur | 16 | 59 | 340 | 0 | 306 | 0 | 0 | 0 | 0 | 0 | 0 |
| Slippurinn - Suð | 17 | 3 | 163 | 0 | 6,037 | 55 | 416 | 10,037 | 3532 | 7060 | 0 |
| Landak.spítali | 18 | 25 | 269 | 0 | 9,995 | 0 | 0 | 6,172 | 39 | 0 | 6 |
| Landakotshæð | 19 | 35 | 463 | 0 | 157 | 680 | 0 | 15,713 | 0 | 721 | 0 |
| Hafnarhús - Miðb | 20 | 0 | 2 | 0 | 11,423 | 0 | 0 | 25,323 | 0 | 0 | 0 |
| Grjótaþorp | 21 | 21 | 91 | 0 | 1,433 | 614 | 12 | 17,890 | 88 | 0 | 0 |
| Tjörnin | 22 | 22 | 102 | 0 | 578 | 121 | 0 | 13,499 | 22 | 0 | 0 |
| Austurhöfnin | 23 | 0 | 147 | 0 | 44,553 | 0 | 0 | 52,480 | 0 | 0 | 0 |
| Austurvöllur | 24 | 0 | 21 | 0 | 7,334 | 4047 | 0 | 16,804 | 0 | 0 | 0 |
| Alþingi | 25 | 0 | 4 | 0 | 154 | 1405 | 0 | 12,189 | 0 | 0 | 0 |
| Lækjartorg | 26 | 0 | 28 | 0 | 10,908 | 165 | 0 | 16,305 | 57 | 0 | 0 |
| Iðnó | 27 | 1 | 4 | 0 | 1,185 | 0 | 0 | 10,954 | 0 | 1014 | 0 |
| Arnarhvoll | 28 | 5 | 48 | 0 | 6,327 | 13672 | 0 | 34,347 | 5867 | 3053 | 0 |
| Stjórnarráð | 29 | 3 | 41 | 0 | 7,083 | 331 | 331 | 9,631 | 1978 | 0 | 0 |
| Lækjargata | 30 | 41 | 288 | 1,474 | 1,076 | 845 | 0 | 17,530 | 249 | 4329 | 0 |
| Laugavegur | 32 | 13 | 289 | 0 | 19,463 | 2703 | 130 | 24,131 | 1673 | 1688 | 10 |
| Skúlgata (miðsv) | 33 | 9 | 618 | 0 | 685 | 779 | 0 | 3,779 | 327 | 7 | 0 |
| Laugavegur-Frakk | 34 | 14 | 261 | 0 | 13,360 | 1489 | 541 | 12,864 | 1067 | 0 | 0 |
| Skólav.stígur | 35 | 40 | 385 | 0 | 4,184 | 516 | 0 | 5,402 | 143 | 15 | 0 |
| Skúlgata (austur | 39 | 11 | 449 | 0 | 3,705 | 462 | 0 | 23,212 | 891 | 0 | 53 |
| Laugavegur | 40 | 25 | 474 | 0 | 25,578 | 791 | 91 | 8,873 | 512 | 0 | 0 |
| Njálsgata | 41 | 38 | 565 | 0 | 617 | 59 | 0 | 1,013 | 199 | 25 | 0 |
| Skólavörðuholt | 42 | 0 | 0 | 813 | 0 | 0 | 0 | 25,591 | 0 | 1676 | 0 |
| Sætún | 43 | 0 | 94 | 0 | 28,324 | 338 | 142 | 87,364 | 6389 | 0 | 51 |
| Hlemmur-Lögreglu | 44 | 1 | 352 | 0 | 8,082 | 1128 | 378 | 29,839 | 1658 | 0 | 0 |
| Rauðarárholt | 45 | 22 | 1,194 | 0 | 8,838 | 1667 | 406 | 43,832 | 9658 | 2742 | 0 |
| Norðurmýri | 46 | 24 | 632 | 0 | 17 | 0 | 0 | 1,560 | 78 | 0 | 0 |
| Kirkjutún | 47 | 30 | 953 | 0 | 12,937 | 1956 | 391 | 104,645 | 10755 | 2404 | 0 |
| Laugavegur | 48 | 0 | 9 | 0 | 11,433 | 1186 | 4592 | 31,127 | 14037 | 0 | 0 |
| Sjómannask. | 49 | 0 | 216 | 760 | 1,719 | 1059 | 0 | 14,301 | 0 | 625 | 404 |
| Kennarahásk. | 50 | 4 | 771 | 0 | 0 | 0 | 0 | 24,307 | 0 | 501 | 0 |
| Vatnsmýri-Loftle | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 29,787 | 3780 | 0 | 7 |
| Háskólinn í Reyk | 52 | 0 | 0 | 0 | 1,530 | 0 | 242 | 29,993 | 5175 | 455 | 20 |
| Hlíðar-vestur | 53 | 15 | 680 | 0 | 0 | 819 | 0 | 1,045 | 510 | 0 | 0 |
| Skógarhlíð | 54 | 0 | 0 | 0 | 0 | 228 | 0 | 20,736 | 978 | 0 | 0 |
| Hlíðar-austur | 55 | 59 | 857 | 1,104 | 3,102 | 324 | 0 | 23,892 | 114 | 0 | 0 |
| Suðurhlíðar - Ve | 57 | 95 | 94 | 0 | 700 | 1451 | 0 | 17,501 | 2824 | 1518 | 2018 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kringlan | 58 | 0 | 0 | 0 | 37364 | 2570 | 0 | 33366 | 3181 | 0 | 0 |
| Listabraut | 59 | 10 | 673 | 1145 | 1134 | 1189 | 16300 | 22839 | 0 | 0 | 0 |
| Hvassaleiti | 60 | 119 | 256 | 0 | 2239 | 1923 | 0 | 6769 | 0 | 1112 | 0 |
| Sléttuvegur | 61 | 43 | 553 | 0 | 28990 | 0 | 0 | 11195 | 0 | 0 | 0 |
| Heiðargerði | 62 | 102 | 133 | 0 | 1187 | 510 | 0 | 802 | 661 | 0 | 175 |
| Álmgerði | 63 | 55 | 515 | 0 | 803 | 362 | 0 | 10534 | 12 | 0 | 0 |
| Eyrarland | 64 | 157 | 225 | 0 | 0 | 0 | 0 | 565 | 15 | 0 | 0 |
| Sogavegur -vestu | 65 | 265 | 278 | 0 | 383 | 207 | 0 | 7321 | 0 | 0 | 0 |
| Hólmgarður | 66 | 0 | 244 | 0 | 0 | 0 | 0 | 762 | 295 | 0 | 0 |
| Hörgsland | 67 | 207 | 209 | 0 | 1161 | 168 | 0 | 1336 | 0 | 0 | 0 |
| Ásgarður | 68 | 222 | 97 | 0 | 0 | 0 | 0 | 5192 | 0 | 1983 | 0 |
| Sogavegur-austur | 69 | 166 | 255 | 0 | 864 | 604 | 0 | 1926 | 1220 | 0 | 53 |
| Ósland | 70 | 165 | 123 | 0 | 0 | 0 | 0 | 4327 | 0 | 0 | 0 |
| Stjörnugróf | 71 | 94 | 106 | 0 | 0 | 104 | 0 | 6195 | 0 | 0 | 0 |
| Lágmúli | 72 | 0 | 0 | 0 | 31507 | 1835 | 1774 | 64938 | 7360 | 0 | 0 |
| Ármúli | 73 | 44 | 346 | 900 | 2184 | 0 | 0 | 19865 | 0 | 71 | 0 |
| Safamýri | 74 | 39 | 722 | 0 | 2271 | 3214 | 0 | 15622 | 136 | 0 | 69 |
| Háaleitisbraut | 75 | 0 | 109 | 0 | 2505 | 1480 | 0 | 2651 | 1624 | 0 | 0 |
| Suðurlandsbraut | 76 | 0 | 2 | 0 | 11219 | 1083 | 660 | 41154 | 6159 | 0 | 188 |
| Ármúli | 77 | 0 | 0 | 0 | 32504 | 1910 | 350 | 40917 | 19758 | 45 | 26 |
| Skeifan (ve) | 78 | 0 | 0 | 0 | 35944 | 1193 | 594 | 16516 | 31591 | 0 | 0 |
| Skeifan (au) | 79 | 0 | 0 | 0 | 20857 | 1484 | 0 | 8124 | 6163 | 0 | 0 |
| Laugarnes-Köllun | 80 | 4 | 0 | 0 | 9383 | 0 | 18184 | 13612 | 84605 | 985 | 6 |
| Rauðalækur | 81 | 14 | 822 | 0 | 280 | 0 | 0 | 9382 | 76 | 0 | 0 |
| Kirkjusandur-Str | 82 | 57 | 402 | 440 | 3146 | 31 | 0 | 17338 | 0 | 0 | 0 |
| Teigar | 83 | 22 | 553 | 0 | 532 | 160 | 0 | 7207 | 43 | 937 | 1261 |
| Sigtún | 84 | 0 | 11 | 0 | 2653 | 135 | 0 | 27743 | 445 | 500 | 0 |
| Laugardalur - no | 85 | 0 | 0 | 0 | 15291 | 27 | 0 | 6061 | 0 | 3033 | 0 |
| Brúnavegur | 86 | 93 | 390 | 0 | 3547 | 75 | 0 | 24888 | 180 | 0 | 0 |
| Laugarásvegur | 87 | 51 | 149 | 0 | 517 | 0 | 0 | 1510 | 136 | 952 | 0 |
| Laugardalur - su | 88 | 3 | 0 | 0 | 436 | 232 | 0 | 33935 | 104 | 676 | 0 |
| Sundahöfn | 89 | 0 | 0 | 0 | 12657 | 459 | 4338 | 13402 | 95042 | 0 | 423 |
| Laugarás | 90 | 96 | 461 | 0 | 780 | 171 | 0 | 0 | 51 | 0 | 0 |
| Holtavegur | 91 | 114 | 436 | 0 | 654 | 0 | 0 | 742 | 769 | 0 | 0 |
| Langholtsvegur | 92 | 71 | 374 | 0 | 394 | 0 | 0 | 2418 | 371 | 0 | 0 |
| Álfheimar | 93 | 86 | 1170 | 0 | 16540 | 1461 | 276 | 15360 | 934 | 775 | 15 |
| Vogar-Mörkin | 94 | 84 | 622 | 780 | 6390 | 345 | 0 | 26668 | 297 | 0 | 0 |
| Skútuvogur | 95 | 0 | 0 | 0 | 24110 | 298 | 994 | 26464 | 142892 | 0 | 66 |
| Bryggjuhverfi | 96 | 24 | 626 | 0 | 109 | 471 | 0 | 418 | 2138 | 0 | 226 |
| Bíldshöfði -vest | 97 | 0 | 0 | 0 | 11877 | 180 | 4381 | 3102 | 15726 | 0 | 266 |
| Bíldshöfði - aus | 98 | 0 | 0 | 0 | 46269 | 576 | 2278 | 20492 | 77212 | 0 | 53 |
| Ártúnsholt | 99 | 262 | 222 | 0 | 6160 | 2470 | 688 | 9908 | 4558 | 5167 | 7181 |
| Höfðabakki | 100 | 0 | 18 | 0 | 8480 | 480 | 1749 | 30546 | 51734 | 0 | 0 |
| Hálsahverfi (ve) | 101 | 0 | 0 | 0 | 22142 | 1674 | 3267 | 15518 | 82399 | 0 | 1130 |
| Árbær (ve) | 102 | 195 | 645 | 0 | 1550 | 1701 | 0 | 1424 | 10 | 0 | 0 |
| Hálsahverfi (au) | 103 | 0 | 1 | 0 | 18271 | 2734 | 8250 | 30310 | 100098 | 3867 | 5 |
| Árbær (au) | 104 | 73 | 491 | 0 | 7424 | 607 | 0 | 12956 | 378 | 1074 | 0 |
| Selás (no) | 105 | 298 | 226 | 0 | 0 | 0 | 0 | 615 | 0 | 0 | 688 |
| Selás (su) | 106 | 242 | 377 | 0 | 713 | 615 | 0 | 6749 | 0 | 0 | 2997 |
| Stekkir | 107 | 118 | 9 | 0 | 0 | 0 | 0 | 834 | 88 | 0 | 0 |
| Mjódd | 108 | 0 | 72 | 0 | 13209 | 8076 | 0 | 9757 | 4661 | 1125 | 15 |
| Suður Mjódd-íbúð | 109 | 0 | 168 | 0 | 0 | 0 | 0 | 5242 | 0 | 0 | 0 |
| Skógarsel | 110 | 181 | 373 | 0 | 662 | 0 | 0 | 7977 | 1073 | 0 | 0 |
| Bakkar- norður | 111 | 73 | 741 | 0 | 1124 | 504 | 0 | 8598 | 0 | 0 | 0 |
| Bakkar- suður | 112 | 47 | 444 | 0 | 0 | 0 | 0 | 535 | 0 | 0 | 0 |
| Seljaskógar | 113 | 426 | 383 | 0 | 146 | 191 | 0 | 6995 | 65 | 1124 | 0 |
| Jaðarsel -vestur | 114 | 221 | 48 | 0 | 125 | 0 | 0 | 9791 | 313 | 242 | 0 |
| Vesturhólar | 115 | 66 | 835 | 0 | 4059 | 315 | 0 | 13 | 0 | 0 | 0 |
| Vesturberg | 116 | 160 | 338 | 0 | 578 | 0 | 0 | 46 | 0 | 0 | 41 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Norðurfell | 117 | 0 | 425 | 0 | 0 | 359 | 0 | 537 | 0 | 0 | 0 |
| Jaðarsel -austur | 118 | 346 | 494 | 0 | 2016 | 0 | 0 | 1950 | 1098 | 0 | 0 |
| Suðurhólar | 119 | 199 | 634 | 1554 | 503 | 2144 | 0 | 21857 | 537 | 948 | 0 |
| Norðurfell | 120 | 40 | 352 | 0 | 6393 | 195 | 0 | 16524 | 0 | 70 | 0 |
| Suðurfell | 121 | 133 | 545 | 0 | 221 | 98 | 0 | 1126 | 0 | 521 | 0 |
| Geldinganes-vest | 122 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gufunes-norður-i | 123 | 0 | 2 | 0 | 0 | 0 | 2284 | 876 | 20244 | 0 | 6616 |
| Hamrahverfi | 124 | 250 | 286 | 0 | 446 | 11 | 0 | 5359 | 0 | 0 | 0 |
| Borgarhverfi- no | 125 | 102 | 14 | 0 | 0 | 0 | 0 | 625 | 0 | 0 | 0 |
| Gylfaflöt | 126 | 0 | 0 | 0 | 2781 | 0 | 0 | 3593 | 27645 | 1820 | 22 |
| Foldir-suður | 127 | 148 | 40 | 0 | 0 | 0 | 0 | 408 | 0 | 0 | 0 |
| Engjahverfi-suðu | 128 | 54 | 566 | 0 | 0 | 0 | 0 | 1989 | 0 | 0 | 0 |
| Rimar-Smárarimi | 129 | 196 | 534 | 0 | 0 | 0 | 0 | 640 | 10 | 0 | 1232 |
| Foldahverfi-aust | 130 | 176 | 98 | 0 | 2815 | 1246 | 0 | 8716 | 0 | 2891 | 0 |
| Staðarhverfi-nor | 131 | 108 | 171 | 0 | 609 | 68 | 0 | 3405 | 0 | 0 | 0 |
| Húsahverfi-austu | 132 | 143 | 333 | 0 | 1157 | 958 | 0 | 8780 | 0 | 0 | 0 |
| Keldur | 133 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 3406 | 0 | 0 |
| Fossaleynir-Egil | 134 | 0 | 0 | 0 | 7008 | 0 | 0 | 29941 | 11438 | 1617 | 0 |
| Leirtjörn - miðk | 135 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grafarholt-vestu | 136 | 45 | 0 | 0 | 240 | 533 | 0 | 0 | 311 | 0 | 0 |
| Reynisvatnsheiði | 137 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1236 | 3547 | 5224 |
| Hádegismóar - go | 138 | 2 | 0 | 0 | 14272 | 155 | 9000 | 6877 | 14928 | 0 | 2622 |
| Norðlingaholt | 139 | 176 | 774 | 0 | 3171 | 0 | 0 | 13554 | 3378 | 0 | 98 |
| Suður-Mjódd-atvi | 140 | 0 | 0 | 0 | 431 | 142 | 0 | 1335 | 44 | 57 | 41 |
| Kársnes | 142 | 149 | 206 | 0 | 952 | 0 | 0 | 1210 | 0 | 0 | 0 |
| Kóp | 144 | 191 | 284 | 0 | 0 | 0 | 0 | 3619 | 0 | 3206 | 0 |
| Kóp | 145 | 5 | 344 | 0 | 6020 | 1866 | 0 | 10259 | 0 | 0 | 0 |
| Kóp | 146 | 108 | 169 | 0 | 0 | 0 | 0 | 0 | 0 | 1685 | 43 |
| Kóp | 147 | 47 | 137 | 0 | 3042 | 65 | 0 | 2253 | 6581 | 0 | 0 |
| Kóp | 148 | 89 | 84 | 1005 | 0 | 0 | 0 | 14771 | 0 | 0 | 95 |
| Kóp | 149 | 208 | 176 | 0 | 165 | 0 | 0 | 863 | 0 | 0 | 0 |
| Kóp | 150 | 57 | 656 | 0 | 0 | 0 | 0 | 29618 | 0 | 0 | 0 |
| Kóp-Nónhæð | 151 | 191 | 390 | 0 | 0 | 231 | 0 | 1350 | 0 | 0 | 0 |
| Furugrund | 152 | 161 | 286 | 0 | 1031 | 0 | 0 | 8846 | 0 | 0 | 0 |
| Kóp | 153 | 58 | 155 | 0 | 349 | 0 | 0 | 158 | 499 | 0 | 0 |
| Kóp | 154 | 127 | 142 | 0 | 0 | 0 | 0 | 9665 | 97 | 0 | 339 |
| Kóp | 155 | 103 | 348 | 0 | 254 | 0 | 0 | 254 | 0 | 0 | 0 |
| Kóp | 156 | 47 | 22 | 0 | 0 | 0 | 0 | 433 | 0 | 0 | 0 |
| Smáralind | 157 | 0 | 0 | 0 | 80267 | 1268 | 0 | 0 | 0 | 91 | 0 |
| Kóp | 158 | 2 | 57 | 0 | 15429 | 1928 | 0 | 31925 | 927 | 0 | 0 |
| Kóp | 159 | 121 | 432 | 0 | 455 | 0 | 0 | 1139 | 0 | 0 | 0 |
| Kóp | 160 | 53 | 455 | 0 | 2257 | 229 | 0 | 1573 | 0 | 76 | 0 |
| Kóp | 161 | 183 | 427 | 0 | 0 | 0 | 0 | 5515 | 5080 | 1137 | 0 |
| Kóp | 162 | 0 | 0 | 0 | 48027 | 159 | 0 | 8499 | 19388 | 183 | 46 |
| Kóp | 163 | 6 | 0 | 0 | 15105 | 0 | 511 | 3303 | 70797 | 0 | 0 |
| Kóp | 164 | 0 | 0 | 0 | 11802 | 0 | 0 | 0 | 35154 | 0 | 0 |
| Kóp | 165 | 271 | 356 | 0 | 20583 | 203 | 0 | 7416 | 260 | 5 | 0 |
| Kóp | 166 | 178 | 255 | 0 | 284 | 0 | 0 | 613 | 0 | 1819 | 1009 |
| Kóp | 167 | 189 | 994 | 0 | 3266 | 860 | 0 | 14258 | 0 | 0 | 0 |
| Álftanes | 168 | 585 | 196 | 0 | 2848 | 25 | 0 | 9445 | 0 | 489 | 0 |
| Garðaholt | 169 | 21 | 2 | 0 | 0 | 0 | 0 | 0 | 48 | 65 | 0 |
| Gbær | 170 | 56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Garðahraun-Gbær | 171 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hraunsholt/Ásar- | 172 | 365 | 1213 | 0 | 3181 | 218 | 398 | 15131 | 20938 | 516 | 0 |
| Gbær (Fitjar-Fla | 173 | 94 | 25 | 0 | 0 | 0 | 0 | 38 | 0 | 0 | 0 |
| Arnarnes | 174 | 177 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 0 |
| Arnarnesvogur | 175 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gbær | 176 | 0 | 2 | 0 | 211 | 0 | 0 | 21397 | 0 | 0 | 0 |
| Miðbær-Gbær | 177 | 111 | 12 | 0 | 5595 | 0 | 0 | 999 | 7961 | 0 | 0 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gbær | 178 | 166 | 0 | 0 | 0 | 53 | 0 | 884 | 0 | 5 | 0 |
| Miðbær | 179 | 1 | 336 | 0 | 10521 | 1812 | 0 | 5513 | 513 | 1507 | 0 |
| Molduhraun | 180 | 0 | 0 | 0 | 7969 | 0 | 0 | 9718 | 91577 | 0 | 0 |
| Arnarneshláls | 181 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Akrar | 182 | 195 | 302 | 0 | 1280 | 180 | 0 | 5955 | 0 | 0 | 0 |
| Gbær | 183 | 106 | 89 | 1009 | 0 | 0 | 0 | 9087 | 0 | 0 | 0 |
| Gbær | 184 | 164 | 113 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Gbær | 185 | 133 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Urriðaholt | 186 | 75 | 727 | 0 | 1140 | 0 | 0 | 8772 | 8 | 0 | 0 |
| Gbær | 187 | 266 | 38 | 0 | 0 | 0 | 0 | 407 | 0 | 0 | 0 |
| Gbær | 188 | 210 | 50 | 0 | 2364 | 915 | 0 | 2497 | 9187 | 0 | 0 |
| Gbær | 189 | 217 | 1 | 0 | 0 | 0 | 0 | 491 | 0 | 0 | 0 |
| Hnoðraholt | 190 | 43 | 2 | 0 | 98 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vífilstaðir | 191 | 7 | 0 | 0 | 0 | 1606 | 0 | 5096 | 0 | 0 | 0 |
| Hfj | 192 | 122 | 212 | 0 | 0 | 0 | 0 | 5651 | 0 | 0 | 0 |
| Hfj | 193 | 138 | 203 | 0 | 916 | 185 | 0 | 9111 | 151 | 0 | 7 |
| Hfj | 194 | 158 | 440 | 0 | 2076 | 34 | 0 | 9223 | 26 | 0 | 30 |
| Hfj | 195 | 101 | 109 | 0 | 0 | 0 | 0 | 64 | 145 | 1695 | 0 |
| Hfj | 196 | 126 | 230 | 0 | 185 | 53 | 0 | 2105 | 172 | 205 | 8 |
| Norðurbakki | 197 | 0 | 386 | 0 | 672 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hfj | 198 | 74 | 152 | 0 | 7985 | 3927 | 0 | 8331 | 150 | 2126 | 0 |
| Hfj | 199 | 1 | 98 | 0 | 25629 | 2277 | 1234 | 28543 | 57106 | 0 | 0 |
| Hfj | 200 | 68 | 306 | 366 | 0 | 1659 | 0 | 13619 | 862 | 394 | 50 |
| Hfj | 201 | 210 | 440 | 0 | 0 | 0 | 0 | 13009 | 34 | 0 | 0 |
| Hfj | 202 | 97 | 329 | 0 | 1636 | 430 | 0 | 1331 | 27 | 0 | 0 |
| Hfj | 203 | 0 | 2 | 0 | 11392 | 519 | 672 | 23098 | 52603 | 415 | 53 |
| Hfj | 204 | 257 | 26 | 0 | 0 | 0 | 0 | 868 | 0 | 0 | 0 |
| Hfj | 205 | 315 | 379 | 0 | 837 | 136 | 0 | 8791 | 0 | 0 | 0 |
| Hfj | 206 | 167 | 472 | 756 | 6545 | 463 | 0 | 18942 | 1127 | 408 | 0 |
| Hfj | 207 | 194 | 165 | 0 | 0 | 0 | 0 | 671 | 0 | 0 | 0 |
| Ásland I | 208 | 269 | 332 | 0 | 128 | 0 | 0 | 8498 | 63 | 0 | 1176 |
| Skipalón-hafnars | 209 | 4 | 530 | 0 | 6170 | 623 | 6687 | 8332 | 108606 | 2202 | 1440 |
| Hfj | 210 | 116 | 193 | 0 | 0 | 0 | 0 | 593 | 0 | 0 | 0 |
| Vellir-miðsvæði | 211 | 0 | 234 | 0 | 20445 | 0 | 0 | 4665 | 0 | 0 | 0 |
| Hvaleyrarholt | 213 | 51 | 451 | 0 | 543 | 0 | 0 | 7914 | 281 | 0 | 0 |
| Hellnahraun 1 | 214 | 0 | 0 | 0 | 689 | 226 | 3736 | 7090 | 56604 | 579 | 3593 |
| Straumsvík-Kapel | 215 | 1 | 0 | 0 | 0 | 0 | 386 | 5634 | 15971 | 1144 | 10619 |
| Blikastaðaland 1 | 218 | 46 | 64 | 0 | 0 | 1175 | 0 | 1346 | 179 | 0 | 0 |
| Höfðar | 219 | 165 | 147 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 |
| Úlfarsfell -vest | 220 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Miðbær | 221 | 7 | 235 | 343 | 14086 | 1668 | 0 | 13240 | 2201 | 0 | 6 |
| Land, Ásar | 222 | 119 | 115 | 0 | 0 | 0 | 0 | 42 | 0 | 0 | 0 |
| Teigsland, sunna | 223 | 110 | 113 | 0 | 0 | 8 | 0 | 2252 | 1443 | 0 | 53 |
| Úlfarsfell - fja | 224 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fiskislóð | 226 | 0 | 68 | 0 | 24910 | 861 | 18328 | 35926 | 56996 | 5863 | 11284 |
| Súðarvogur | 227 | 0 | 59 | 0 | 2871 | 0 | 847 | 6029 | 38527 | 0 | 13 |
| Kóp | 228 | 559 | 1732 | 0 | 7203 | 8 | 0 | 44121 | 972 | 1123 | 4408 |
| Kóp | 229 | 281 | 430 | 0 | 80 | 0 | 554 | 14356 | 43 | 101 | 0 |
| Útmörk (Þingvallavegur) | 230 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Útmörk (Vesturlandsvegur) | 231 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Útmörk (Suðurlandsvegur) | 232 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Útmörk (Reykjanesbraut) | 233 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Útmörk | 234 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Útmörk | 235 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Útmörk | 236 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 237 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Álfsnes-vestur-i | 241 | 13 | 0 | 0 | 0 | 0 | 0 | 2266 | 12437 | 0 | 513 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kjalarnes -vestu | 243 | 158 | 48 | 0 | 2299 | 192 | 866 | 3814 | 599 | 334 | 0 |
| Vatnmýri - opið | 253 | 0 | 0 | 1470 | 0 | 0 | 0 | 10001 | 0 | 0 | 0 |
| Vísindagarðar | 254 | 0 | 291 | 0 | 0 | 0 | 0 | 46689 | 453 | 0 | 0 |
| LSH-suður | 255 | 0 | 0 | 0 | 0 | 0 | 0 | 8852 | 0 | 0 | 0 |
| Hlíðarfótur | 256 | 0 | 92 | 0 | 0 | 0 | 0 | 1873 | 0 | 0 | 0 |
| Öskjuhlíð | 257 | 0 | 0 | 0 | 0 | 240 | 0 | 3584 | 0 | 654 | 2817 |
| Skerjafjörður-au | 258 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 713 | 0 | 0 |
| Eiríksgata/Egilsgata | 260 | 7 | 229 | 0 | 1340 | 0 | 29 | 0 | 0 | 0 | 0 |
| Snorrabraut/Barónsstíg ur | 261 | 0 | 28 | 0 | 4517 | 156 | 0 | 12012 | 3085 | 0 | 1084 |
| Þingholt vestan Njarðargötu | 262 | 31 | 139 | 0 | 0 | 1253 | 0 | 2755 | 0 | 306 | 0 |
| Þingholt austan Bergstaðastrætis | 263 | 105 | 442 | 0 | 450 | 194 | 62 | 6027 | 88 | 120 | 0 |
| Þingholt austan Njarðargötu | 264 | 16 | 161 | 0 | 0 | 0 | 0 | 1078 | 0 | 1164 | 0 |
| LHS-norður | 265 | 0 | 0 | 0 | 130599 | 0 | 0 | 1527 | 400 | 0 | 0 |
| Laufásvegur | 266 | 33 | 71 | 0 | 0 | 0 | 0 | 1330 | 0 | 0 | 9 |
| Klambratún | 267 | 0 | 0 | 0 | 0 | 0 | 225 | 155 | 0 | 3018 | 0 |
| Elliðaárvogur | 297 | 0 | 0 | 0 | 0 | 0 | 0 | 162 | 2304 | 0 | 578 |
| Ártúnshöfði | 298 | 0 | 1 | 0 | 163 | 245 | 2928 | 5432 | 25656 | 0 | 0 |
| Spöngin | 300 | 0 | 0 | 0 | 5297 | 1693 | 0 | 2286 | 73 | 0 | 0 |
| Glaðheimar | 301 | 0 | 283 | 0 | 12507 | 317 | 231 | 8083 | 21914 | 370 | 0 |
| Vatnsendahlíð | 303 | 0 | 0 | 0 | 0 | 0 | 0 | 255 | 50 | 0 | 0 |
| Rauðhólar-Hólmur | 306 | 9 | 0 | 0 | 0 | 0 | 0 | 885 | 0 | 0 | 638 |
| Suður-Mjódd-atvi | 309 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Borgarhverfi-suð | 325 | 12 | 301 | 0 | 0 | 0 | 0 | 4760 | 0 | 0 | 0 |
| Rimar-vestur | 326 | 156 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Foldir-norður | 327 | 192 | 455 | 0 | 307 | 0 | 0 | 451 | 0 | 0 | 0 |
| Engjahverfi-norð | 328 | 38 | 109 | 1260 | 215 | 64 | 0 | 15690 | 0 | 0 | 0 |
| Rimar-suður | 329 | 98 | 530 | 0 | 999 | 448 | 0 | 9179 | 0 | 0 | 0 |
| Staðarhverfi-suð | 331 | 125 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Húsaverfi-vestur | 332 | 101 | 63 | 0 | 3097 | 0 | 0 | 9098 | 0 | 53 | 0 |
| Grafarholt-vestu | 336 | 22 | 326 | 0 | 1960 | 0 | 0 | 1927 | 0 | 854 | 0 |
| Grafarholt-austu | 337 | 43 | 240 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grafarholt-vestu | 338 | 80 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grafarholt-vestu | 339 | 50 | 192 | 0 | 0 | 0 | 0 | 7505 | 0 | 0 | 4243 |
| Grafarholt-vestu | 340 | 16 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grafarholt-atvin | 341 | 0 | 0 | 0 | 14071 | 834 | 0 | 5244 | 4762 | 0 | 0 |
| Grafarholt-vestu | 342 | 16 | 70 | 0 | 3929 | 0 | 0 | 0 | 0 | 0 | 0 |
| BSÍ-Vatnsmýri | 400 | 0 | 0 | 0 | 505 | 0 | 0 | 1518 | 0 | 0 | 39 |
| Hlíðarendi | 401 | 0 | 595 | 0 | 9053 | 0 | 0 | 7653 | 1080 | 150 | 53 |
| Keldnaholt | 403 | 0 | 0 | 0 | 0 | 0 | 0 | 1515 | 9655 | 0 | 0 |
| Korputorg | 404 | 0 | 0 | 0 | 46019 | 135 | 0 | 0 | 9 | 0 | 682 |
| Hamrahlíð - kirk | 405 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Úlfarsfell IIb-B | 406 | 0 | 0 | 0 | 21957 | 0 | 0 | 964 | 0 | 0 | 0 |
| Lambhagi | 407 | 6 | 0 | 0 | 2415 | 0 | 0 | 0 | 2929 | 0 | 0 |
| Úlfarsfell IIa | 408 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Úlfarsfell Ia | 409 | 174 | 298 | 0 | 0 | 0 | 0 | 13286 | 0 | 0 | 0 |
| Úlfarsfell IIIb | 410 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Úlfarsfell IIIa | 411 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Úlfarsfell Iva | 414 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Úlfarsá | 415 | 0 | 0 | 0 | 0 | 0 | 0 | 301 | 0 | 0 | 0 |
| Reynisvatnsás | 416 | 99 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grafarholt-austu | 420 | 82 | 648 | 0 | 201 | 0 | 0 | 7687 | 0 | 0 | 0 |
| Kjalarnes-austur | 424 | 33 | 0 | 0 | 3523 | 351 | 0 | 163 | 8218 | 0 | 0 |
| Borgarhverfi-ves | 425 | 66 | 164 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gufunes-suður-gr | 426 | 1 | 0 | 0 | 0 | 0 | 0 | 233 | 114 | 0 | 0 |
| Foldir-norðvestu | 427 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Víkurhverfi - su | 428 | 39 | 131 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gufuneskirkjugar | 429 | 0 | 0 | 0 | 0 | 0 | 0 | 1607 | 0 | 0 | 0 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Korpuvöllur | 431 | 0 | 0 | 0 | 0 | 52 | 0 | 0 | 0 | 0 | 432 |
| Bæjarkjarni-Korp | 500 | | | 0 | | | | | | | |
| Blikastaðaland 2 | 501 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hlíðahverfi | 502 | 121 | 347 | 0 | 307 | 149 | 0 | 13493 | 18 | 11 | 0 |
| Tangar | 503 | 297 | 47 | 0 | 0 | 0 | 0 | 70 | 0 | 10 | 0 |
| Holt | 504 | 242 | 116 | 0 | 0 | 0 | 0 | 229 | 0 | 0 | 0 |
| Varmá-íþróttasvæ | 505 | 1 | 0 | 0 | 969 | 0 | 0 | 18428 | 0 | 229 | 0 |
| Varmá-hesthúsasv | 506 | 0 | 0 | 0 | 318 | 0 | 0 | 0 | 0 | 0 | 2866 |
| Helgafell-norður | 507 | 11 | 113 | 0 | 0 | 0 | 0 | 0 | 281 | 0 | 0 |
| Helgafell-suður | 508 | 65 | 440 | 0 | 421 | 0 | 0 | 5771 | 325 | 0 | 26 |
| Reykjalundur | 509 | 41 | 2 | 0 | 5238 | 0 | 0 | 8656 | 4043 | 0 | 0 |
| Reykir | 510 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 879 | 0 | 0 |
| Akrar | 511 | 20 | 3 | 0 | 32 | 0 | 0 | 0 | 1274 | 0 | 0 |
| Teigar-vestur | 512 | 141 | 102 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Teigar-austur | 513 | 4 | 3 | 0 | 0 | 0 | 520 | 2619 | 35362 | 0 | 112 |
| Reykjahverfi | 514 | 239 | 10 | 0 | 0 | 0 | 0 | 701 | 34 | 0 | 746 |
| Hlíðartúnshverfi | 515 | 60 | 35 | 0 | 35 | 0 | 0 | 1987 | 327 | 0 | 0 |
| Hlíðartúnshverfi | 516 | 0 | 1 | 0 | 0 | 0 | 0 | 228 | 31781 | 0 | 0 |
| Helgafell- fjall | 519 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mosfellsdalur-su | 521 | 65 | 0 | 0 | 117 | 0 | 257 | 2494 | 732 | 1024 | 204 |
| Mosfellsdalur-no | 522 | 15 | 0 | 0 | 0 | 89 | 0 | 1165 | 376 | 149 | 0 |
| Hlíðartúnshverfi | 523 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 181 | 0 |
| Víkurhverfi - no | 528 | 47 | 283 | 0 | 0 | 0 | 0 | 5050 | 0 | 0 | 0 |
| Ásland 3 | 600 | 117 | 119 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hesthús | 602 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vellir 7 | 604 | 20 | 116 | 0 | 0 | 0 | 0 | 8900 | 0 | 0 | 0 |
| Vellir 1-2 | 605 | 46 | 560 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Haukar | 606 | 4 | 0 | 0 | 0 | 5 | 0 | 4911 | 0 | 0 | 32 |
| Vellir 4 | 607 | 140 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vellir 5+6 | 608 | 121 | 130 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vellir 3 | 609 | 29 | 502 | 0 | 0 | 0 | 0 | 10384 | 0 | 0 | 0 |
| Hamranes 1 | 610 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Selhraun 1 | 614 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7529 | 0 | 0 |
| Kapelluhraun 2 | 615 | 0 | 0 | 0 | 0 | 0 | 613 | 498 | 479 | 0 | 0 |
| Hellnahraun 2 | 616 | 0 | 0 | 0 | 2750 | 0 | 2522 | 1904 | 39040 | 117 | 0 |
| Hvaleyrarholt 2 | 618 | 63 | 42 | 0 | 0 | 0 | 0 | 0 | 610 | 0 | 0 |
| Vellir 5+6 | 619 | 104 | 20 | 0 | 0 | 0 | 0 | 807 | 0 | 0 | 0 |
| Selhraun 2 | 620 | 0 | 0 | 0 | 1754 | 7 | 0 | 9550 | 6780 | 0 | 0 |
| Selhraun 3 | 621 | 0 | 0 | 0 | 1738 | 0 | 0 | 2723 | 8901 | 0 | 0 |
| Setberg-G | 700 | 0 | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 0 | 0 |
| Svínholt | 701 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kauptún | 702 | 0 | 0 | 0 | 59087 | 30 | 0 | 0 | 0 | 0 | 162 |
| Úlfarsfell Ib | 709 | 87 | 193 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grafarholt-námsm | 720 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hvörf 1 | 730 | 0 | 0 | 0 | 21124 | 0 | 0 | 31152 | 16105 | 0 | 0 |
| Ögurhvarf | 731 | 0 | 0 | 0 | 8202 | 0 | 0 | 1356 | 1234 | 0 | 0 |
| Kársnes-Bryggjuhverfi | 732 | 23 | 241 | 0 | 51 | 0 | 0 | 2756 | 10149 | 0 | 0 |
| Kársnes-blandað | 733 | 3 | 85 | 0 | 562 | 0 | 0 | 1000 | 37315 | 0 | 0 |
| Kársnes-Bryggjuh | 734 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18218 | 0 | 0 |
| Kársnes | 735 | 99 | 147 | 0 | 100 | 25 | 0 | 4878 | 0 | 0 | 0 |
| Kársnes-Þingholtsbraut | 736 | 139 | 122 | 0 | 0 | 77 | 0 | 152 | 0 | 0 | 0 |
| Kópavogstún | 737 | 80 | 353 | 0 | 2930 | 0 | 0 | 9889 | 0 | 1661 | 0 |
| Lundur | 738 | 27 | 361 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Auðbrekka | 739 | 0 | 90 | 0 | 12103 | 1996 | 0 | 9816 | 23721 | 0 | 0 |
| Keflavíkurflugvöllur | 740 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hrauntúngur | 741 | 0 | 0 | 0 | 0 | 0 | 0 | 92 | 0 | 0 | 0 |
| Hrauntúngur | 742 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hamranes | 743 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 724 |
| Ásland | 744 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ásland | 745 | 12 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 270 | 746 | 4 | 0 | 0 | 0 | 0 | 1452 | 0 | 27946 | 0 | 763 |
| 270 | 747 | 390 | 2 | 0 | 0 | 64 | 0 | 820 | 2165 | 184 | 0 |
| 270 | 748 | 0 | 0 | 0 | 5511 | 0 | 0 | 1991 | 8590 | 219 | 0 |
| Hvassahraun | 749 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

# Appendix G Land use data 2024

| Area | Zone number | Year | Single family house | Multi family apartments | Shopping and service (high trip rates) | Shopping and service (low trip rates) | Light industry | Office and Schools | Storage and heavy industry | Specialized (church, prison, cemetery) |
|---|---|---|---|---|---|---|---|---|---|---|
| Hrólfsskálamelur o.fl. | 1 | 2024 | | 37 | 0 | 0 | 0 | 0 | 0 | 0 |
| Keilugrandi 1 | 3 | 2024 | | 78 | 0 | 0 | 0 | 0 | 0 | 0 |
| HÍ-Gamli Garður | 10 | 2024 | | 60 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nýlendurreitur, Héðinsreitur | 13 | 2024 | | 282 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bykó-lóð | 14 | 2024 | | 70 | -2,000 | 600 | 0 | 0 | 0 | 0 |
| Hafnartorg-Austurhöfn | 23 | 2024 | | 141 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brynjureitur | 34 | 2024 | | 77 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hverfigata, Barónsreitur | 39 | 2024 | | 168 | 0 | 0 | 0 | 0 | 0 | 0 |
| Höfðatorg I | 43 | 2024 | | 94 | 0 | 0 | 0 | 0 | 0 | 0 |
| Borgartún | 47 | 2024 | | 51 | 0 | 0 | 0 | 0 | 0 | 0 |
| RÚV-lóð | 59 | 2024 | | 290 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fossvogur vestur | 61 | 2024 | 15 | 332 | | | | 1,400 | | |
| Sogavegur 73-77 | 65 | 2024 | | 45 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kirkjusandur | 81 | 2024 | 0 | 300 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vogabyggð I | 95 | 2024 | | 330 | 0 | 0 | 0 | 0 | -5,700 | 0 |
| Bryggjuhverfi II* | 96 | 2024 | | 63 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hraunbær 103-105 | 102 | 2024 | | 60 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hraunbær-Bæjarháls | 104 | 2024 | | 215 | 0 | 0 | 0 | 0 | 0 | 0 |
| Suður-Mjódd | 109 | 2024 | | 140 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gufunes-1.áfangi | 123 | 2024 | 200 | 300 | 0 | 0 | 0 | 0 | 0 | 0 |
| Úlfarsárdalur - Leirtjörn | 135 | 2024 | 50 | 310 | 0 | 1,550 | 0 | 0 | 0 | 0 |
| Elliðabraut-Norðlingaholt | 139 | 2024 | | 199 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nónhæð | 150 | 2024 | 0 | 140 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201 Smári | 157 | 2024 | | 180 | 0 | 9,576 | 0 | 0 | 0 | 0 |
| 201 Smári | 158 | 2024 | | 440 | 0 | 3,105 | 0 | 0 | 0 | 0 |
| Sveinskot Álftanesi | 168 | 2024 | 15 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Ásar | 172 | 2024 | | 76 | 0 | 0 | 0 | 0 | 0 | 0 |
| Akraland | 181 | 2024 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Urriðaholt | 186 | 2024 | | 418 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hjallabraut | 193 | 2024 | | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vestubær | 196 | 2024 | 7 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Hraun-Miðbær | 200 | 2024 | | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Öldur/Kinnar | 202 | 2024 | | 6 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Gamli bær | 206 | 2024 | 1 | 50 | | | | | | |
| Óla Run tún | 210 | 2024 | | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Miðbær | 221 | 2024 | | 186 | 350 | 0 | 0 | 4,000 | 0 | 0 |
| Krikahverfi | 223 | 2024 | 2 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Vogabyggð II | 227 | 2024 | 0 | 776 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sérbýli í Kórum og Vatnsenda | 228 | 2024 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vísindagarðar | 254 | 2024 | | 244 | 0 | 0 | 0 | 17,500 | 0 | 0 |
| Öskjuhlíð-Nauthólsvegur | 256 | 2024 | | 125 | 0 | 0 | 0 | 0 | 0 | 0 |
| Glaðheimar | 301 | 2024 | | 160 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spöngin-Móavegur | 325 | 2024 | | 155 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hlíðarendi | 401 | 2024 | | 673 | 0 | 0 | 0 | 0 | 0 | 0 |
| Úlfarsárdalur - núverandi hverfi | 409 | 2024 | | 190 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reynisvatnsás | 416 | 2024 | | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hlíðarhverfi | 502 | 2024 | 17 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Helgafellshverfi 1.-3.áfangi | 508 | 2024 | 54 | 110 | 0 | 0 | 0 | 10,000 | 0 | 0 |
| Reykjahverfi | 510 | 2024 | 13 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Ásland 3 | 600 | 2024 | 2 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Skarðshlíð | 604 | 2024 | 286 | 286 | 0 | 0 | 0 | 11,500 | 0 | 0 |
| Tjarnarvellir | 606 | 2024 | | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vellir 5 | 608 | 2024 | 9 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Vellir 3 | 609 | 2024 | | 41 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vellir 6 | 619 | 2024 | 3 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Úlfarsárdalur - núverandi hverfi (Urðarbrunnur ofl) | 709 | 2024 | | 147 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grafarholt-Klausturstígur-Kapellustígur | 720 | 2024 | | 52 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bryggjuhverfi | 732 | 2024 | | 230 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kársnes | 733 | 2024 | | 160 | 0 | 5,000 | 4,800 | 0 | 0 | 0 |
| Lundur | 738 | 2024 | 0 | 70 | 0 | 0 | 0 | 0 | 0 | 0 |
| Auðbrekka rammasamkomulag | 739 | 2024 | | 60 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ásland 4 og 5 | 745 | 2024 | 340 | 240 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leirvogstunguhverfi | 747 | 2024 | 124 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Gylfaflöt AT 3 | 126 | 2024 | 0 | 0 | 0 | 0 | 0 | 0 | 15,000 | 0 |

*Table 12-10 Land use data in 2024 compared to the base year 2019*

# Appendix H Land use data 2029

| Area | Zone number | Year | Single family house | Multi family apartments | Shopping and service (high trip rates) | Shopping and service (low trip rates) | Light industry | Office and Schools | Storage and heavy industry | Specialized (church, prison, cemetery) |
|---|---|---|---|---|---|---|---|---|---|---|
| Bygggarðar | 1 | 2029 | 30 | 114 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vesturbugt | 13 | 2029 | | 176 | 0 | 0 | 0 | 0 | 0 | 0 |
| Frakkastígur-Skúlagata | 39 | 2029 | | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Höfðatorg II | 43 | 2029 | | 86 | 0 | 0 | 0 | -1,500 | 0 | 0 |
| Laugavegur-Skipholt-Heklureitur | 45 | 2029 | | 400 | 0 | 0 | 0 | 0 | -9,658 | -2,742 |
| Borgartún | 47 | 2029 | 0 | 151 | 0 | 0 | 0 | -2,200 | 0 | 0 |
| KHÍ-lóð | 50 | 2029 | | 160 | 0 | 0 | 0 | 0 | 0 | 0 |
| Múlar-Suðurlandsbraut | 76 | 2029 | | 400 | 0 | 0 | 0 | 0 | 0 | 0 |
| Miðbær | 148 | 2029 | | 180 | 0 | 0 | 0 | 0 | 0 | 0 |
| Álftanes | 168 | 2029 | 104 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Garðahverfi | 169 | 2029 | 28 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Garðahraun suður | 171 | 2029 | 24 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lyngás, L6, H4 | 172 | 2029 | 4 | 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| Urriðaholt N og V | 186 | 2029 | 12 | 367 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hrafnista | 193 | 2029 | | 150 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hraun vestur | 199 | 2029 | | 850 | 0 | 0 | -1,234 | 0 | -20,000 | 0 |
| Súluhöfði | 219 | 2029 | 19 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Miðbær, svæði E | 221 | 2029 | | 73 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vatnsendahvarf | 229 | 2029 | 100 | 300 | 0 | 0 | 0 | 0 | 0 | 0 |
| LSH | 255 | 2029 | 0 | 0 | 0 | 74,300 | 0 | 15,500 | 0 | 0 |
| Skerjabyggð | 258 | 2029 | | 600 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leirvogstunguhverfi | 270 | 2029 | 94 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ártúnshöfði- svæði 1 | 297 | 2029 | | 1,500 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vatnsendahlíð | 303 | 2029 | 400 | 350 | 0 | 0 | 0 | 0 | 0 | 0 |
| Helgafellstorfan | 507 | 2029 | 45 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Helgafellshverfi 1.-3.áfangi | 508 | 2029 | | 58 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reykjahvoll | 510 | 2029 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sjómannaskólareitur | 49 | 2029 | | 140 | 0 | 0 | 0 | 0 | 0 | 0 |
| Auðbrekka rammasamkomulag | 739 | 2029 | | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| Esjumelar AT5 austan Vesturlv. Sv A | 746 | 2029 | 0 | 0 | 0 | 0 | 0 | 0 | 8,105 | 0 |
| Leirvogstunguhverfi | 747 | 2029 | 70 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Flensborgarhöfn | 209 | 2029 | | 300 | 0 | 0 | 0 | 0 | -15,000 | 0 |
| Blikastaðaland | 218 | 2029 | 100 | 300 | 0 | 2,000 | 0 | 0 | 0 | 0 |
| Gufunes-1.áfangi | 123 | 2029 | 100 | 200 | 0 | 1,500 | 0 | 0 | 0 | 0 |
| Kringlan | 58 | 2029 | | 500 | -2,500 | 0 | 0 | -4,500 | 0 | 0 |
| Álfsnes Norður I2 | 241 | 2029 | 0 | 0 | 0 | 0 | 0 | 0 | 50,000 | 0 |
| Vatnsendahvarf (AT-6) | 730 | 2029 | 0 | 0 | 0 | 0 | 0 | 0 | 37,554 | 0 |

*Table 12-11 Land use data in 2029 compared to year 2024*

# Appendix I Land use data 2034

| Area | Zone number | Year | Single family house | Multi family apartments | Shopping and service (high trip rates) | Shopping and service (low trip rates) | Light industry | Office and Schools | Storage and heavy industry | Specialized (church, prison, cemetery) |
|---|---|---|---|---|---|---|---|---|---|---|
| Landhelgisgæslureitur | 14 | 2034 | | 75 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sætúnsreitur | 43 | 2034 | | 100 | 0 | 0 | 0 | 0 | -3,500 | 0 |
| Hátún+ | 47 | 2034 | | 400 | 0 | 0 | 0 | 0 | 0 | 0 |
| Veðurstofuhæð | 57 | 2034 | | 150 | 0 | 0 | 0 | 0 | 0 | 0 |
| SS-reitur | 82 | 2034 | | 225 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blómavalsreitur | 84 | 2034 | | 108 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bryggjuhverfi III (Ártúnshöfði svæði 4) | 96 | 2034 | | 800 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ártúnshöfði- svæði 2 | 97 | 2034 | | 1,200 | 0 | 0 | 0 | 0 | 0 | 0 |
| Traðir | 148 | 2034 | | 300 | 0 | 0 | 0 | 0 | 0 | 0 |
| Miðbær (Hörgatún) | 177 | 2034 | | 60 | 0 | 0 | 0 | 0 | 0 | 0 |
| Urriðaholt | 186 | 2034 | 45 | 201 | 0 | 0 | 0 | 27,100 | 0 | 0 |
| Hnoðraholt Vífilsstaðir | 191 | 2034 | 250 | 200 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hraun vestur | 199 | 2034 | 0 | 1,100 | 0 | 0 | 0 | 0 | -37,106 | 0 |
| Lyngbarð | 210 | 2034 | | 150 | 0 | 0 | 0 | 0 | 0 | 0 |
| Krikahverfi | 223 | 2034 | 2 | | 21,000 | 0 | 0 | 0 | 0 | 0 |
| Kjalarnes - Grundarhverfi | 243 | 2034 | 23 | | 0 | 0 | 0 | 0 | 0 | 0 |
| LSH | 255 | 2034 | 0 | 0 | 0 | 0 | 0 | 15,000 | 0 | 0 |
| Öskjuhlíð-Nauthólsvegur | 256 | 2034 | | 330 | 0 | 0 | 0 | 0 | 0 | 0 |
| Skerjabyggð | 258 | 2034 | | 300 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ártúnshöfði- svæði 3 | 298 | 2034 | | 900 | 0 | 0 | 0 | 0 | 0 | 0 |
| Glaðheimar | 301 | 2034 | | 0 | 20,000 | 14,000 | 0 | 50,000 | 0 | 0 |
| Helgafellsáfangi 4. áfangi | 508 | 2034 | 70 | 43 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hamranes | 610 | 2034 | 180 | 45 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kársnes | 733 | 2034 | | 300 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hólmsheiði AT4 | 138 | 2034 | 0 | 0 | 0 | 0 | 0 | 0 | 125,700 | 0 |
| Esjumelar AT5 austan Vesturlv. Sv B | 746 | 2034 | 0 | 0 | 0 | 0 | 0 | 0 | 126,522 | 0 |
| Blikastaðaland | 218 | 2034 | 175 | 1,200 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gufunes | 123 | 2034 | | 200 | 0 | 1,000 | 0 | 0 | 0 | 0 |
| Kringlan | 58 | 2034 | | 500 | | 0 | 0 | | 0 | 0 |
| Keldur | 133 | 2034 | | 750 | 3,500 | 1,500 | 0 | 0 | 0 | 0 |
| Esjumelar AT5 vestan Vesturlv. *** | 241 | 2034 | 0 | 0 | 0 | 0 | 0 | 0 | 204,000 | 0 |

*Table 12-12 Land use data in 2034 compared to year 2029*

# Appendix J Economic data for transport

# Data for the demand model

## The value of time

The table below contains time values in ISK for different means of transport according to the trip's purpose. All time values are stated in 2019 market prices.

1. **The value of free travel time:**

*((Total Disposable Income 2018/Total number of hours worked in 2018)*Wage index2019/Wageindex2018)*0,5*[1]

2. **The value of business time:**

*((Total labour cost 2018/Total number of hours worked 2018)* Wage index2019/Wageindex2018)*(GDP-market prices-2018/Gross Factor-income2018)*

I suggest we use the Danish relative factors used for scaling the values:

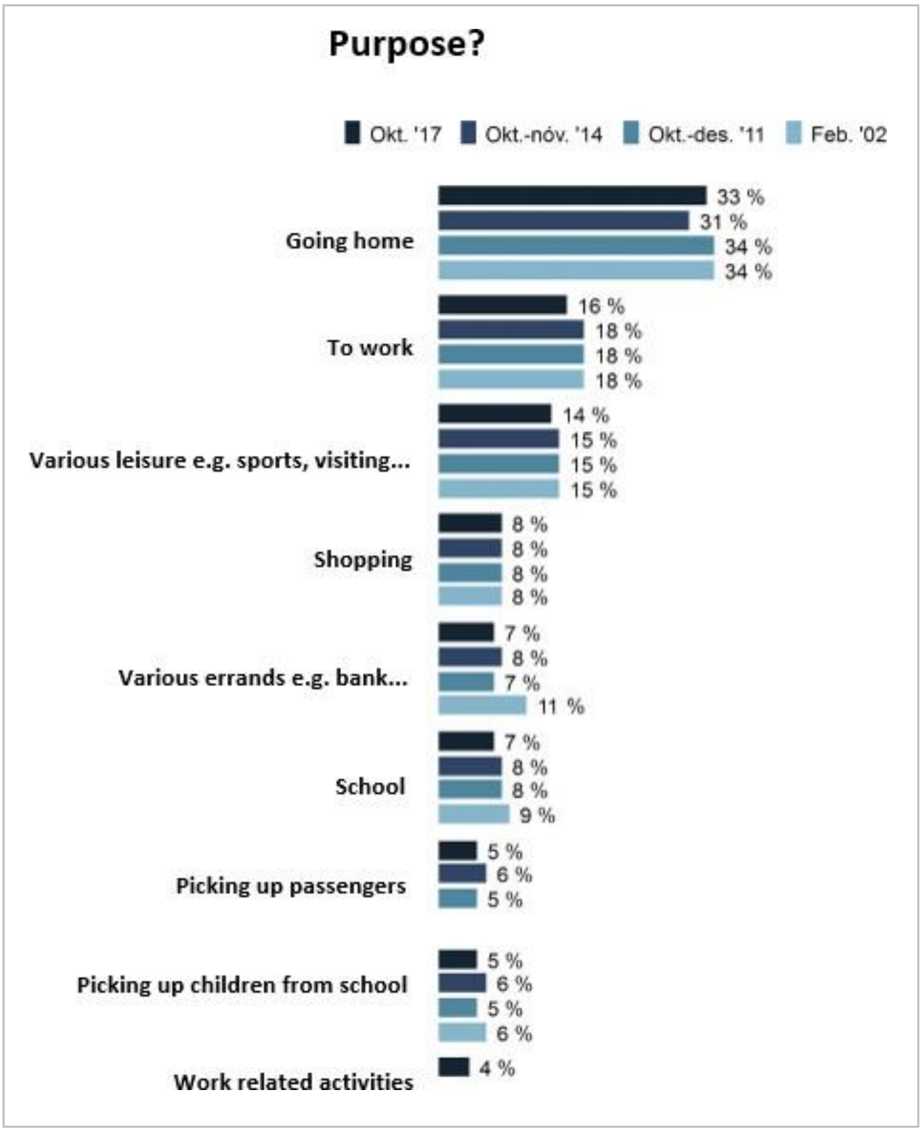
1. Congested travel time for cars: Free travel * 1,5
2. Delays/Waiting/Access/Egress/First Wait/Transfer/Punishment = Travel time on board * 3/2/1,5/1,5/0,8/1,5/0,1

| | Work | Education | Leisure | Errands | Business | All/average |
|---|---|---|---|---|---|---|
| **Car:** | | | | | | |
| Free travel time | 2.068 | 2.068 | 2.068 | 2.068 | 6.332 | 2.475 |
| Congested travel time | 3.101 | 3.101 | 3.101 | 3.101 | 9.499 | 3.713 |
| Bus/Public transport: | | | | | | |
| Travel time on board | 2.068 | 2.068 | 2.068 | 2.068 | 6.332 | 2.472 |
| Delays | 6.203 | 6.203 | 6.203 | 6.203 | 18.997 | 7.416 |
| Waiting time | 4.135 | 4.135 | 4.135 | 4.135 | 12.665 | 4.944 |
| Access time | 3.101 | 3.101 | 3.101 | 3.101 | 9.499 | 3.708 |
| Egress time | 3.101 | 3.101 | 3.101 | 3.101 | 9.499 | 3.708 |
| First wait time | 1.654 | 1.654 | 1.654 | 1.654 | 5.066 | 1.977 |
| Transfer time | 3.101 | 3.101 | 3.101 | 3.101 | 9.499 | 3.708 |
| Transfer “punishment” (price per transfer) | 207 | 207 | 207 | 207 | 633 | 247 |
| **Bike** | 2.068 | 2.068 | 2.068 | 2.068 | 6.332 | 2.198 |
| **Walk** | 2.068 | 2.068 | 2.068 | 2.068 | 6.332 | 2.198 |

Those are the same values that will be used in the socio-economic analysis.

[1] The 0,5 factor is a factor commonly used in Iceland for free travel time i.e. half the average disposable income per hour.

When it comes to the "all/average" calculations the Icelandic travel surveys lack transparency and is not clearly classified according to transport mode (see below – 2018 travel survey)[2]:




Therefore I suggest we use the same split as used in T-E for calculating the column all/average .

***Transportarbejdets fordeling på turformål***

| i % | Bolig-arbejde/ uddannelse | Erhverv | Andet | Sum |
|---|---|---|---|---|
| Kollektive rejsende | 44,2% | 9,5% | 46,3% | 100,0% |
| Bilister | 26,5% | 9,6% | 63,9% | 100,0% |
| Cyklister | 45,7% | 3,1% | 51,2% | 100,0% |

[2] https://www.ssh.is/images/stories/Samgongumal/2017Ferdavenjur/01_4027650_Ferdavenjur_a_hofudborgarsvaedinu_080118.pdf

# Data for the demand model

## Driving costs

The data in Iceland is scarce and unreliable. Our best course of action in many places is ***using the danish values for driving costs and convert them with PPP indices from Eurostat.*** Stated below are the main assumptions.

### Private cars

When trying to assess driving costs I have opted to use the newest version of „Transportøkonomiske enhedspriser“ and update each cost-component by PPP conversion or , where applicable, Icelandic data.

| **Cost component** | | **Value** | **Conversion factor** |
|---|---|---|---|
| Drivmiddel | inkl. afgifter | 14,858 | **1** |
| Batteri (hybrid- og elbiler) | inkl. afgifter | 0,133 | **2** |
| Dæk | inkl. afgifter | 1,718 | |
| Reparation og vedligeholdelse | inkl. afgifter | 21,159 | |
| Ejerafgift | inkl. afgifter | 1,135 | **3** |
| Afskrivninger | inkl. afgifter | 14,089 | **4** |
| **I alt** | inkl. afgifter | **53,092** | |

1. The only underlying assumption changed here is the gasoline and electricity prices and traffic split according to energy usage – 56,8% - 39.3% - 2,6% - 1,3% (gasoline, diesel. hybrid, electric). I was able to use data from Iceland Statistics on median kilometers driven by households[3]. Other parameters such as “drivmiddelforbrug” and “realitetsfaktor” were left unchanged seeing we don’t have accurate data on that in Iceland.

2. Here I opted to use the PPP relative price index “Transport” from Eurostat. That index contains purchase of vehicles and various services – the entire Transport services actually. It would of course be more accurate to ask Eurostat to provide us with relevant subindices (i.e. maintenance of personal vehicles etc). I dont think it would affect the uncertainty though so I have opted to use the whole „Transport“ index here. [4]

3. The only recurrent taxes paid in Iceland i.e. “ejerafgift” is “bifreiðagjöld” – (according to the vehicles emission) and could be interpreted as fixed or variable.

4. Here I opted to use the PPP relative price index “Transport Services”, more specifically “Purchase of vehicles”. This is the only subindex from the transport PPP that I was available online from Eurostat.

When estimating cost for private cars erhverv, we subtract value added tax from every cost component.

[3] For some reason they choose to use medians instead of averages, citing inaccuracies in underlying data.
[4] https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=prc_ppp_ind&lang=en

# Data for the demand model

## Vans

| *Afstandsafhæng kørselsomk for varebiler* | | | Conversion factor |
|---|---|---|---|
| Kr. per km | | 2019 | |
| Diesel | faktorpriser | 9,80 | **1** |
| Dæk | faktorpriser | 1,81 | **2** |
| Reparation og vedligehold | faktorpriser | 13,20 | |
| Afskrivninger | faktorpriser | 2,28 | **3** |
| **Omkostninger ekskl afgifter** | faktorpriser | **27,09** | **-** |
| Afgifter (ikke refunderbare) | faktorpriser | 16,75 | **4** |
| **Omkostninger inkl afgifter** | faktorpriser | **43,83** | |
| **Omkostninger inkl afgifter** | markedspris | **50,62** | |
| *Note: Der opregnes fra faktorpris til markedspris vha. nettoafgiftsfaktoren* | | | **5** |

| *Tidsafhæng kørselsomk for varebiler* | | | Conversion factor |
|---|---|---|---|
| Kr. per time | | *2019* | |
| Afskrivninger | faktorpriser | 117 | **3** |
| Løn | faktorpriser | 3.800 | **6** |
| Reparation | faktorpriser | 220 | **2** |
| Kapacitet | faktorpriser | 837 | **7** |
| **Omkostninger ekskl afgifter** | faktorpriser | **4.974** | **-** |
| Vægtafgift mm. | faktorpriser | - | **8** |
| Registreringsafgift | faktorpriser | - | |
| Afgifter i alt (ikke refunderbare) | faktorpriser | - | **-** |
| **Omkostninger inkl afgifter** | faktorpriser | **4.974** | |
| **Omkostninger inkl afgifter** | markedspris | **5.744** | |

1. The only underlying assumption changed here is the gasoline prices (without VAT). I did not factor in discounts as you do i.e. „normale rabatter“. Other assumptions such as Energieffektivitet and realitetsfaktor were left unchanged.
2. See conversion factor „2“ in the private cars assumptions.
3. See conversion factor „4“ in the private cars assumptions.
4. Here we have to add „bifreiðagjöld“ instead of „registreringsafgift“.Note that we could count this as fixed or variable cost – could be stated under time dependent costs as well.
5. The nettoafgiftsfaktor is calculated as average GDP-market prices/GDP factor prices in 2014-2018.
6. The average wage paid to drivers of vans/trucks according to Iceland statistics.
7. Those costs are varied so I use PPP indices for GDP.
8. There are no time dependent taxes that I can think of.

# Data for the demand model

## Trucks

All the same assumptions as above for conversion factors, except starred*

| Kr. per km | | *2019* | Conversion factor |
|---|---|---|---|
| Diesel | faktorpriser | 32,76 | **1** |
| Dæk | faktorpriser | 5,01 | **2** |
| Reparation og vedligehold | faktorpriser | 12,2 | |
| Afskrivninger | faktorpriser | 5,15 | **3** |
| **Omkostninger ekskl afgifter** | faktorpriser | **55,12** | |
| Afgifter (ikke refunderbare) | faktorpriser | 41,06 | **4*** |
| **Omkostninger inkl afgifter** | faktorpriser | **96,19** | |
| **Omkostninger inkl afgifter** | markedspris | **111,08** | |
| *Note: Der opregnes fra faktorpris til markedspris vha. nettoafgiftsfaktoren* | | | **5** |

| ***Tidsafhæng kørselsomk for lastbiler*** | | | Conversion factor |
|---|---|---|---|
| Kr. per time | | *2019* | |
| Afskrivninger | faktorpriser | 911 | **3** |
| Løn | faktorpriser | 3.800 | **6** |
| Reparation og vedligehold | faktorpriser | 307 | **2** |
| Kapacitet | faktorpriser | 1112 | **7** |
| **Omkostninger ekskl afgifter** | faktorpriser | **6.131** | **-** |
| Vejafgifter mm. | faktorpriser | - | **8** |
| Registreringsafgift | faktorpriser | - | |
| Afgifter i alt (ikke refunderbare) | faktorpriser | | **-** |
| **Omkostninger inkl afgifter** | faktorpriser | **6.131** | |
| **Omkostninger inkl afgifter** | markedspris | **7.080** | |

4*: Here, in addition to bifreiðagjöld, we have to add „þungaskattur“ (weight-tax).