Reykjavík, 25. ágúst 2025
USK25080117

**UMSÖGN VIÐ TILLÖGU**

**Viðtakandi**: Umhverfis- og skipulagsráð
**Sendandi**: Skrifstofa samgangna og borgarhönnunar

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Á fundi umhverfis- og skipulagsráðs, dags. 13. ágúst 2025, var lögð fram svohljóðandi tillaga fulltrúa Sjálfstæðisflokksins um gatnamót Höfðabakka og Bæjarháls:

> *Lagt er til að hætt verði við að fjarlægja tvo beygjuvasa (hægribeygju-framhjáhlaup) við gatnamót Höfðabakka og Bæjarháls í ljósi þess að framkvæmdin mun draga úr umferðarflæði og valda verulegum töfum á umferð um viðkomandi götur, ekki síst til og frá Árbæjarhverfi.*

*Greinargerð fylgir tillögu:*

> *Umhverfis- og skipulagsráð Reykjavíkur samþykkti á fundi sínum 26. marz sl. heimild til verkhönnunar og gerðar útboðsgagna vegna endurhönnunar á Höfðabakka. Borgarfulltrúar Sjálfstæðisflokksins studdu heils hugar þann hluta verksins, sem fól í sér almennar úrbætur á umferð. Þar á meðal endurnýjun umferðarljósabúnaðar á fimm gatnamótum á Höfðabakka og bætta gatnalýsingu.*
> *Fulltrúar Sjálfstæðisflokksins lögðust hins vegar eindregið gegn því að tveir beygjuvasar (hægribeygju-framhjáhlaup) yrðu fjarlægðir við gatnamót Höfðabakka og Bæjarháls. Bentu fulltrúar Sjálfstæðisflokksins á að slík breyting myndi að öllum líkindum draga úr umferðarflæði og valda töfum á umferð til og frá Árbæjarhverfi.*
> *Framkvæmdir standa nú yfir við að fjarlægja umræddа beygjuvasa og þrengja þannig gatnamótin. Þegar á framkvæmdatímanum hefur lokun beygjuvasanna aukið umferðartafir gífurlega á gatnamótunum og leitt til umferðaröngþveitis á annatímum.*
> *Ljóst er orðið að lokun beygjuvasanna hefur mjög neikvæð áhrif á gatnakerfið á svæðinu. Umrædd gatnamót og Höfðabakkinn í heild gegna mikilvægu hlutverki fyrir Árbæjarhverfi og Ártúnsholt en einnig fyrir Breiðholt, Grafarvog og fleiri hverfi. Óheillavænlegt er að raska núverandi umferðarskipulagi á gatnamótunum þegar augljóst er að það mun hafa stórauknar umferðartafir í för með sér. Ákjósanlegt er því að hverfa frá þrengingu gatnamótanna og láta umræddа beygjuvasa halda sér þar.*

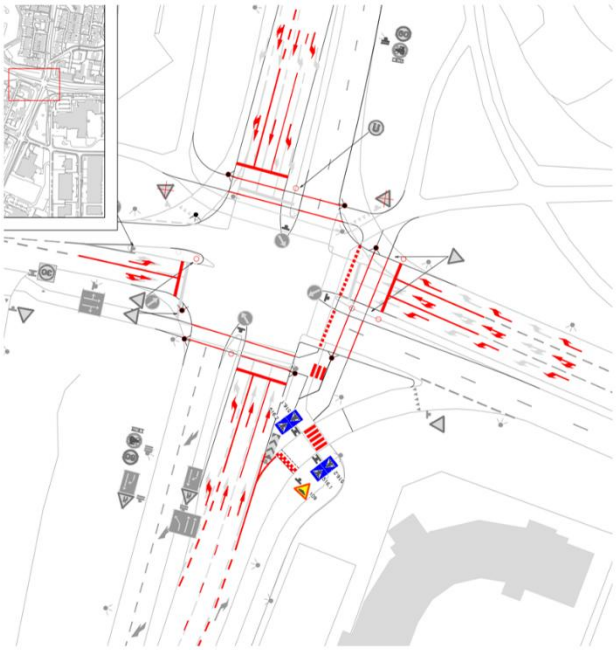
Reykjavík

*Breytingin getur einnig haft neikvæð áhrif á viðbragðstíma sjúkra- og slökkvibifreiða. En slökkvistöð er við Tunguháls, skammt frá gatnamótum Höfðabakka og Bæjarháls sem nú á að þrengja.*

Tillögunni var vísað til umsagnar umhverfis- og skipulagssviðs, skrifstofu samgangna og borgarhönnunar dags. 20. ágúst 2025.

**Umsögn:**

Á Höfðabakka norðan gatnamótanna eru í dag fjórar akreinar til suðurs, þ.e. tvær vinstribeygjureinar, ein beint áfram og ein hægribeygjurein á framhjáhlaupi. Bílstjórar á leið suður Höfðabakka með fyrirhugaða akstursstefnu vestur Streng, þ.e. í hægri beygju, eru á leið af götu með hámarkshraða 50 km/klst inn á götu með hámarkshraða 30 km/klst. Þar sem slíkt er útfært með hægribeygju-framhjáhlaupi er umferðaröryggi skert fyrir bæði gangandi á gatnamótum, sem og á götu sem ekið er inn á. Umferðartalningar gefa til kynna að tiltölulega lítil eftirspurn er eftir hægribeygju af Höfðabakka úr norðri til vesturs á Streng og því ekki talin þörf á sérstakri frárein af Höfðabakka. Við breytingarnar mun því fækka þeim stöðum á gatnamótunum þar sem straumar gangandi/hjólandi og akandi skerast, sem hefur jákvæð áhrif á umferðaröryggi.



*Mynd 1 Gatnamót Höfðabakka og Bæjarháls. Hönnun gatnamótanna eins og hún var kynnt og samþykkt á fundi umhverfis- og skipulagsráðs 26. mars 2025. Rauðar línur eru áætlaðar yfirborðsmerkingar eftir breytingar. Útlínur gatnamótanna fyrir breytingar sjást með daufri grárri línu.*

Umferðartalningar leiða einnig í ljós að eftirspurn eftir því að komast úr norðri á Höfðabakka til suðurs yfir gatnamótin, er tvöfalt meiri en eftirspurn eftir vinstri beygju úr norðri til austurs inn á Bæjarháls. Þar af leiðandi var lagt til að breyta fyrirkomulagi akreina inn í gatnamótin úr norðri þannig að tvær akreinar verði fyrir akstur beint áfram til suðurs og ein vinstribeygjurein fyrir akstur til austurs á Bæjarhálsi. Eftir breytingar verða því samtals þrjár akreinar inn í umrædd gatnamót af Höfðabakka úr norðri, þ.e. ein vinstribeygjurein og tvær beint áfram, þar af heimilt að taka hægri beygju af annarri þeirra. Ekki er unnt að gera eina sameiginlega akrein áfram og til vinstri, því hagstæðasta útfærsla ljósastýringar m.v. umferðarmagn er þannig að ekki logar alltaf samtímis grænt fyrir þessar akstursstefnur.

Á þverun yfir Bæjarháls sýna umferðartalningar að um 100 einstaklingar fari hjólandi á dag og yfir Höfðabakka þvera um 150 á hjóli. Ekki eru upplýsingar um fjölda gangandi á gatnamótunum. Samkvæmt hjólreiðaáætlun Reykjavíkurborgar, 2021-2025, mun

hjólastígur liggja meðfram Höfðabakka í gegnum gatnamótin, og annar að og frá austri, um Dragháls og Krókháls. Sá stígur verður megintenging Grafarholts og Úlfarsárdals við stíganetið sunnan Vesturlandsvegar. Þegar þessir nýju hjólastígar verða gerðir er ljóst að aðstæður hjólandi verði töluvert betri, og þar með muni fjölga þeim sem kjósa að hjóla um gatnamótin. Þar sem að um er að ræða aðskilda gangstéttir og hjólastíga er ekki unnt að koma þeim fyrir í núverandi þríhyrningseyju við hægribeygjuframhlaup af Bæjarhálsi úr austri til norðurs á Höfðabakka, vegna plássleysis. Umfram það má sjá á slysavefsjá Samgöngustofu að töluvert er um aftanákeyrslur í framhjáhlaupinu, það samræmist fræðunum þar sem hægribeygjuhlaup er inn á veg með umtalsverðri bílaumferð og hraða.

Af þessum sökum var talið öruggast að fækka þeim stöðum þar sem leiðir gangandi/hjólandi og akandi skerast, og fjarlægja það sem hefur skapað aftanákeyrslur með því að gera hægri beygjuna ljósastýrða af Bæjarhálsi, úr austri til norðurs inn á Höfðabakka. Gert er ráð fyrir óbreyttum fjölda akreina á Bæjarhálsi við gatnamótin í báðar aksturstefnur og fyrirkomulag akreina á öðrum örmum gatnamótanna er óbreytt frá því fyrir breytingar.

Í forvinnu að endurskoðun ljósastýringar við gatnamótin var verkfræðistofan COWI fengin til að greina áhrif af mismunandi útfærslum gatnamótanna, sú greining er í viðhengi við þessa umsögn. Greining COWI bendir til þess að raðir vinstri beygju af Höfðabakka úr norðri til austurs inn á Bæjarháls muni aukast en heildartafir í gatnamótunum muni minnka. Áhrifanna mun gæta sérstaklega síðdegis, en samhliða munu tafir þeirra sem eiga erindi beint yfir gatnamótin eða í hægri beygju til vesturs inn á Streng minnka. Sú lausn sem var valin og verið er að framkvæma er sambland af Senario F og G.

Líkt og fram kemur í tillögunni standa framkvæmdir yfir. Af þeim sökum hefur ekki verið tekin í notkun ný ljósastýring sem hönnuð hefur verið fyrir breytta útfærslu gatnamóta, og er því enn í notkun hin eldri. Eldri umferðarljósastýring tekur hvorki mið af núverandi umferðastraumum, útfærslu gatnamótanna og hefur hún ekki möguleika á að veita viðbragðsaðilum eða almenningssamgöngum forgang, en það mun breytast með nýrri ljósastýringu. Þær tafir sem ökumenn upplifa má því bæði rekja til þess að ný umferðarljósastýring er ekki komin í notkun sem og að framkvæmdir standa enn yfir og má því rekja hluta mögulegra tafa til þeirra, enda er vinna í gangi mjög nærri akbrautum og þar af leiðandi ákveðnar akreinar þrengdar á og við gatnamótin.

Virðingarfyllst,
Bjarni Rúnar Ingvarsson
*Deildarstjóri samgangna*
*Skrifstofa samgangna og borgarhönnunar*

Hjálagt: Greining COWI á gatnamótum Höfðabakka. Sú lausn sem var valin og verið er að framkvæma er sambland af Senario F og G. Á töflu 4 á bls. 14 má sjá áætlaða tafartíma mismunandi útfærslna. Áætlaður tafatími á Bæjarhálsi („East approach“) er í samræmi við Scenario G, en fyrir aðra strauma er áætlaður tafatími í samræmi við Scenario F.

Reykjavík

REYKJAVÍKURBORG MUNICIPALITY

# CAPACITY ANALYSIS OF HÖFÐABAKKI

TECHNICAL NOTE

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# CONTENTS



# APPENDICES

# 1 Background

This technical note compares the performance of two junctions by looking at two scenarios, with and without a right turn slip lane in the southeast corner of each junction. The southern junction has some extra scenarios to test the capabilities within the solution with or without the slip lane. The junctions that are considered are the junction of Höfðabakki and Bíldshöfði (the northern junction) and the junction of Höfðabakki and Bæjarháls (the southern junction). The software SIDRA Intersection is used for this analysis. In this analysis, the level of service (LOS) of the junction, the queue lengths and the delay are compared for the two different scenarios for both morning and afternoon peak hours.

The background information used in this analysis is from the municipality Reykjavíkurborg. This is the geometry of the junctions, the traffic input and the signal documentation. Today, at both junctions there are slip lanes for more than one approach, but there are plans to change the geometry of the junctions and remove the slip lanes to make the junctions safer and give higher importance to pedestrians and cyclists. It is, however, uncertain how much effect removing or keeping the slip lanes in the southeast corner of the junctions will have on the traffic. This analysis investigates this effect and compares the two scenarios of having a slip lane and having no slip lane.

# 2 Scenarios

Capacity calculations have been carried out for the following scenarios:

- Scenario A: Northern junction, without slip lane:
  - A.1: AM peak hour
  - A.2: PM peak hour
- Scenario B: Northern junction, with slip lane:
  - B.1: AM peak hour
  - B.2: PM peak hour
- Scenario C: Southern junction, without slip lane:
  - C.1: AM peak hour
  - C.2: PM peak hour
- Scenario D: Southern junction, without slip lane, with updated signals:
  - D.1: AM peak hour
  - D.2: PM peak hour
- Scenario E: Southern junction, without slip lane, with updated geometry:

- E.1: AM peak hour
- E.2: PM peak hour

- Scenario F: Southern junction, with slip lane:
  - F.1: AM peak hour
  - F.2: PM peak hour

- Scenario G: Southern junction, with slip lane, updated geometry:
  - G.1: AM peak hour
  - G.2: PM peak hour

# 3 Study basis and assumptions

## 3.1 Traffic volumes

The traffic in all scenarios is from 2021 provided by Reykjavíkurborg Municipality. The percentage of heavy traffic is assumed to be 5 %. Pedestrian and cyclist traffic was also included.

Figure 1 and Figure 2 show the traffic in the northern junction and the southern junction respectively.

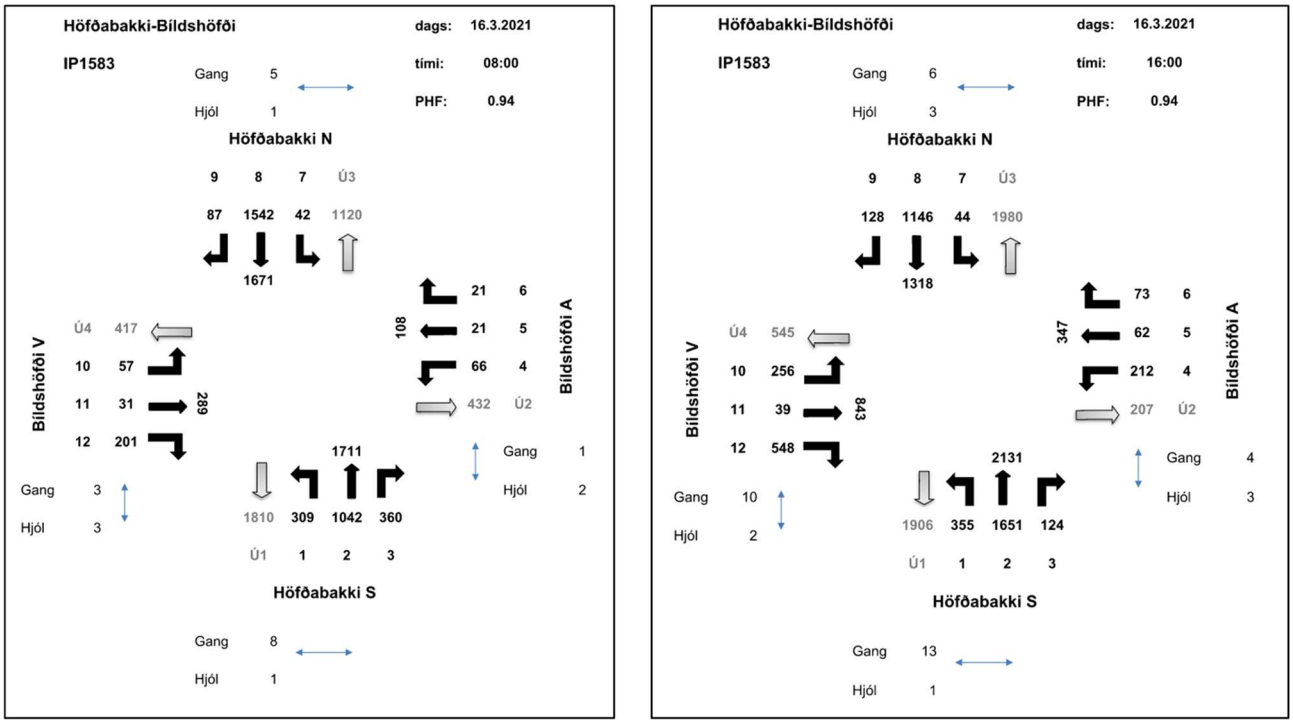


*Figure 1: Traffic volumes in the northern junction, Höfðabakki/Bíldshöfði*

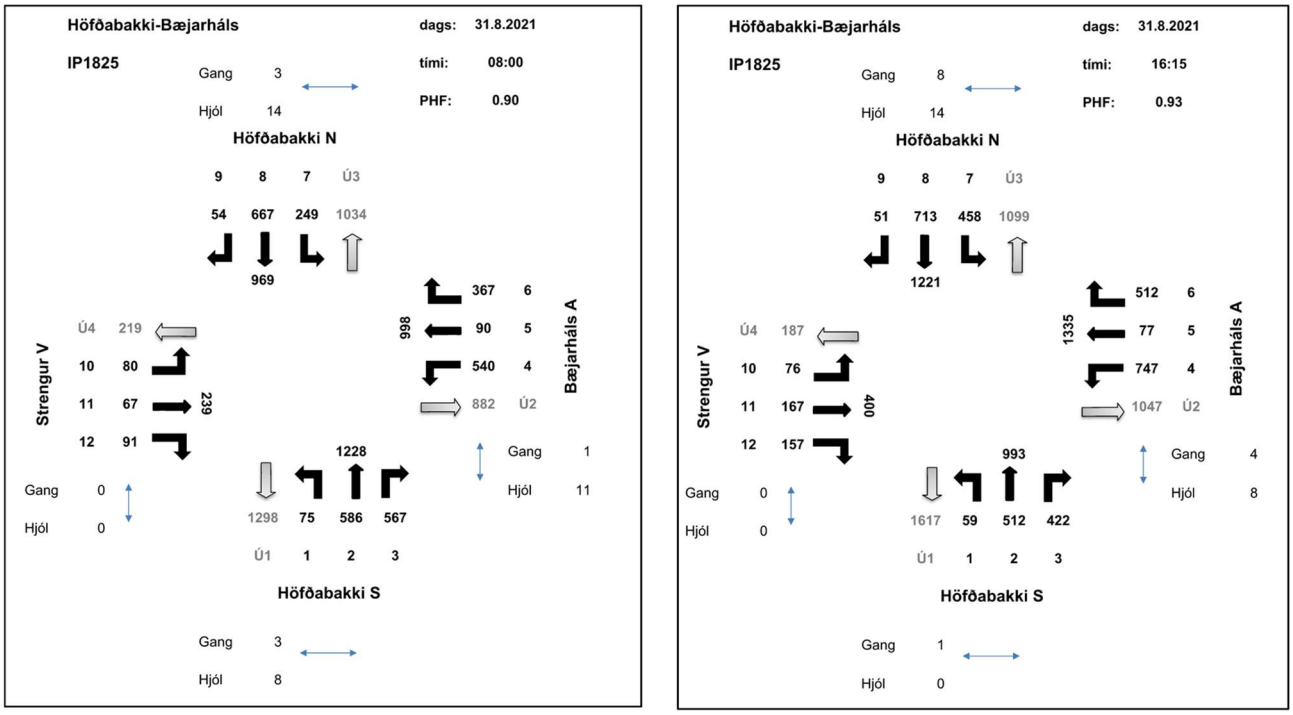


*Figure 2: Traffic volumes in the southern junction, Höfðabakki/Bæjarháls*

## 3.2 Geometry

The geometry of the junction is based on drawings provided by Reykjavíkurborg Municipality.

Figures below show the layouts of the junctions as modelled in SIDRA.

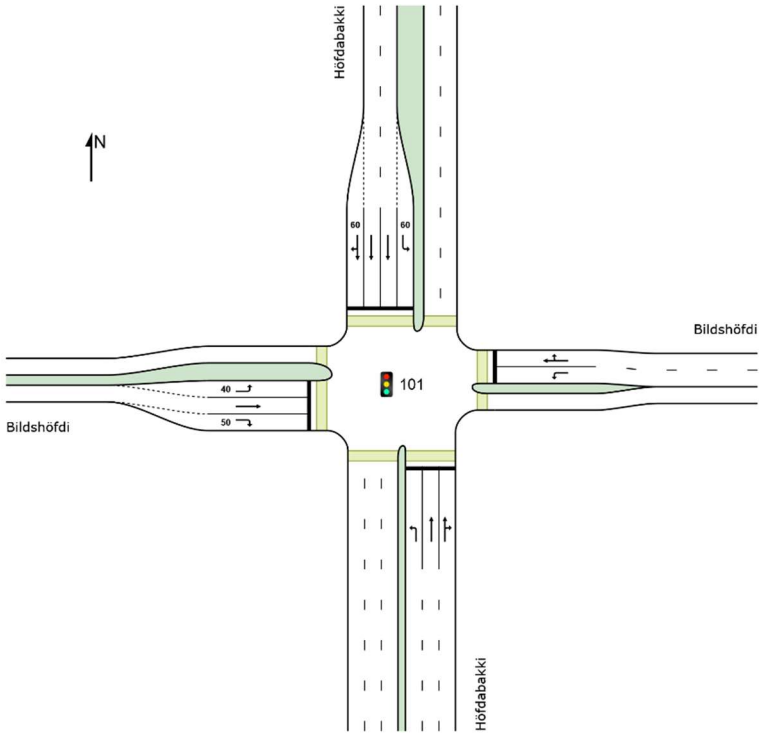


*Figure 3: Northern junction Höfðabakki/Bíldshöfði – without slip lane (Scenario A)*

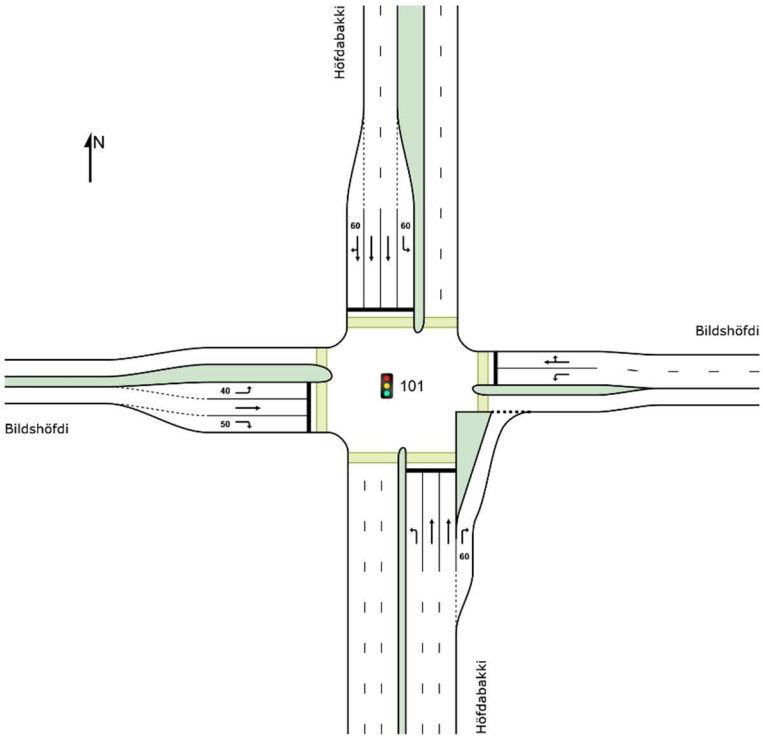


*Figure 4: Northern junction Höfðabakki/Bíldshöfði – with slip lane (Scenario B)*

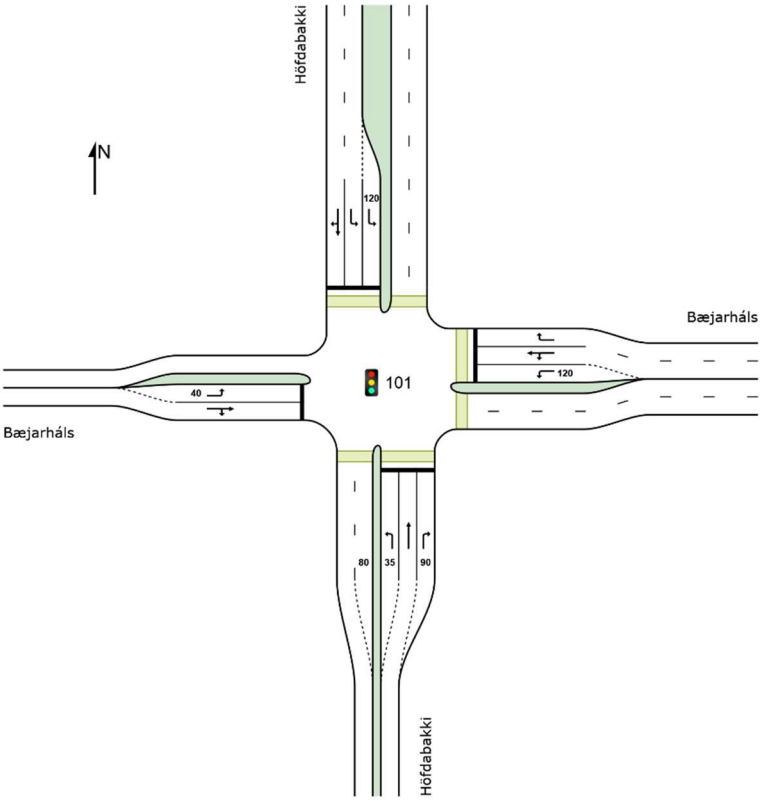


Figure 5: Southern junction Höfðabakki/Bæjarháls – without slip lane (Scenario C + D)

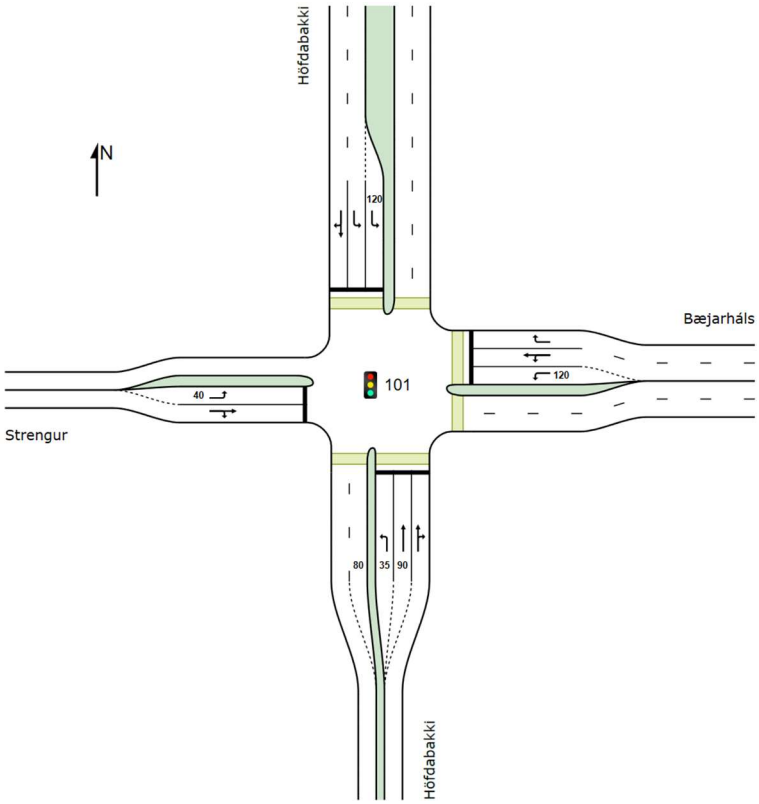


*Figure 6: Southern junction Höfðabakki/Bæjarháls – without slip lane, with updated geometry (Scenario E)*

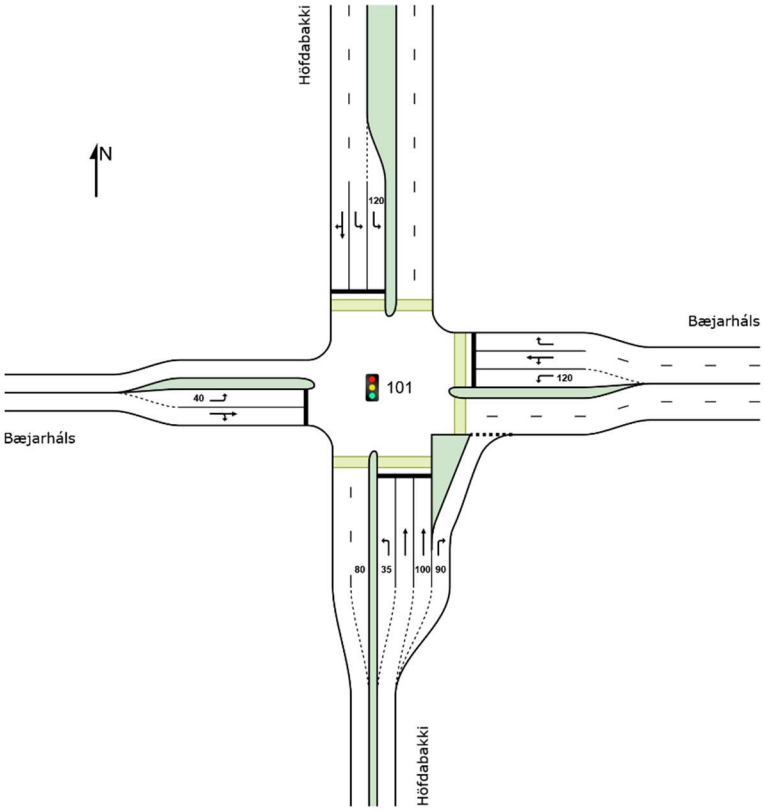


*Figure 7: Southern junction Höfðabakki/Bæjarháls – with slip lane (Scenario F)*

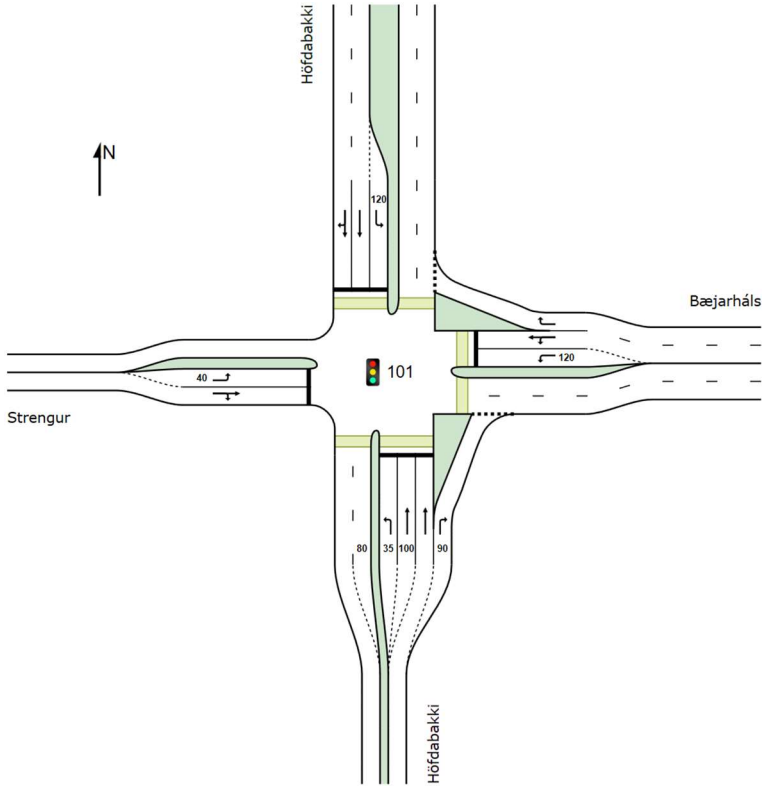


*Figure 8: Southern junction Höfðabakki/Bæjarháls – with slip lane, with updated geometry (Scenario G)*

## 3.3 Signal setting

The traffic signals in both junctions operate with a fixed cycle time of 90 sec. in the AM and PM peak programs.

The green time in each phase is however traffic actuated within a certain minimum and maximum range.

In the northern junction the traffic signal operates with three different signal phases, where phase 3 has three different variants. Here the variant 3A is modelled in SIDRA as this variant is assumed to be the most common one in rush hours.

In the southern junction the traffic signal operates with four different signal phases, where phase 4 has three different variants. Here the variant 4A is modelled in SIDRA as this variant is assumed to be the most common one in rush hours.

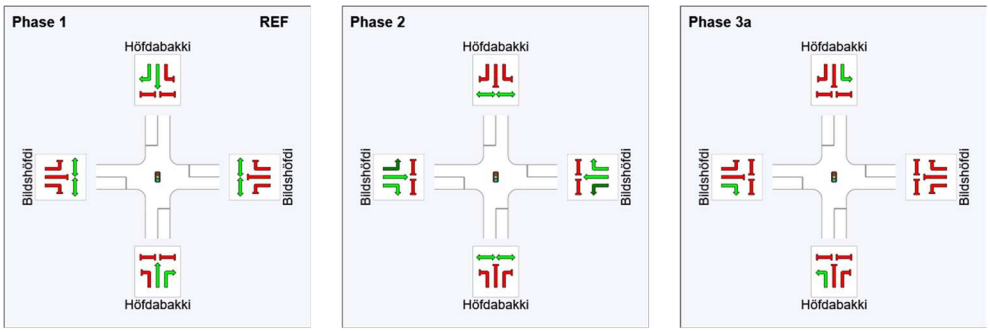


*Figure 9: Traffic signal phases in northern junction*

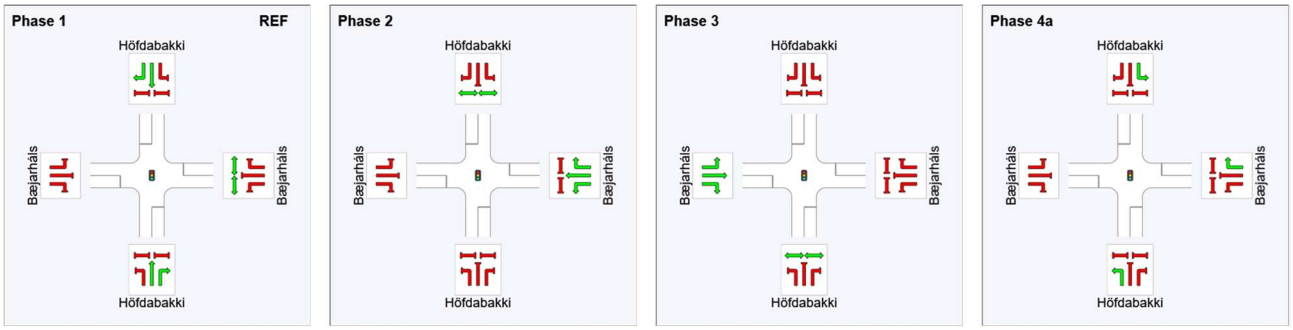


*Figure 10: Traffic signal phases in southern junction (basis)*

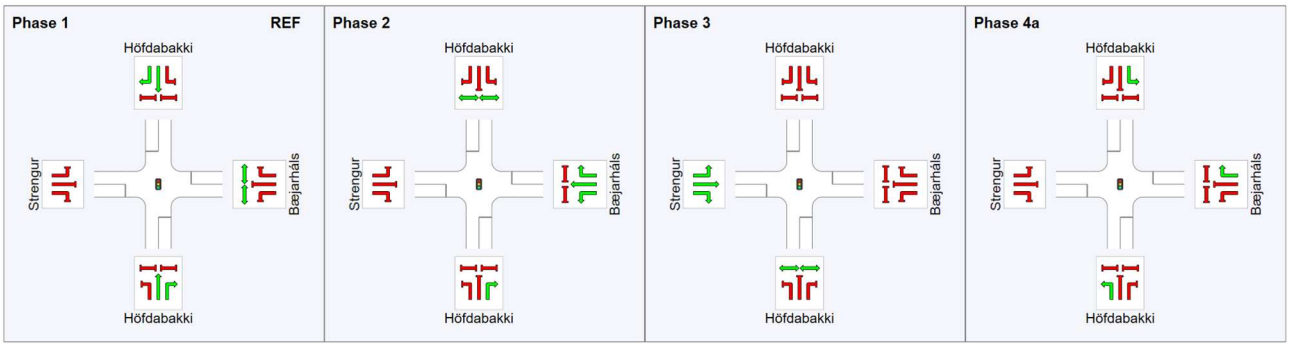


Figure 11: Traffic signal phases in southern junction (updated with right turning movement from south allowed in phase 2)

# 4 Study methodology

## Operational analysis

SIDRA Intersection version 9.1 has been applied for the junction analysis. The software follows Highway Capacity Manual (2010) guidelines. Thus, the definition of LOS is similar as in HCM 2010.

SIDRA Intersection requires input for geometry, traffic volumes, signal settings if applicable, speed limits, priorities, gap acceptance and other factors. The output from SIDRA Intersection can be user defined, but will typically be delay, degree of saturation, queue lengths, number of stops, etc. shown, per lane, per approach, per junction or per entire network.

## Performance Measurement

The Level of Service (LOS) is the term which broadly denotes the combination of operating conditions that occur on a given road or lane when it is accommodating various traffic volumes and is used to measure the quality of service. LOS takes account of many factors including:

- Speed;
- Travel Time;
- Traffic Interruption;
- Freedom to manoeuvre, that is to change lanes, accelerate or decelerate;
- Safety;
- Driving comfort, which is subjective, and depends on the perception of each individual driver;
- Convenience - an estimate of how well the road serves the function for which it is designed.

For this study two main parameters are used for the evaluation of the performance of key junctions and the access points to the road network within the study area. Those parameters are:

- Delay (d) seconds/vehicle.
- Maximum queue length (given in meters as 95-percentile).

Level of Service (LOS) for junctions is assessed using the average delay for the key junctions, as it is defined in The Highway Capacity Manual 2010 (HCM, 2010).

LOS is graded A, B, C, D, E and F, where Level A is the highest (best) and Level F is the lowest (worst). The lower the LOS, the greater is the traffic density and the higher is the likelihood of delays occurring through the interaction of vehicles within the traffic stream.

Following Table 1 shows the definition of Level of Service (LOS). Table 2 shows different LOS criteria/grades for signalized and non-signalized intersections respectively.

*Table 1: LOS definition (Source: HCM 2010)*

| Level of Service [LOS] | Performance Description |
|---|---|
| A | Free-flow conditions with unimpeded manoeuvrability. Stopped delay at Signalised intersection is minimal. |
| B | Reasonably unimpeded operations with slightly restricted maneuverability. Stopped delays are not bothersome. |
| C | Stable operations with somewhat more restrictions in making mid-block lane changes than LOS B. Motorists will experience appreciable tension while driving. |
| D | Approaching stable operations where small increases in volume produce substantial increases in delay and decreases in speed. |
| E | Operations with significant intersection approach delays and low average speeds. |
| F | Operations with extremely low speeds caused by intersection congestion, high delay, and adverse signal progression. |

*Table 2: LOS intervals for signalized and non-signalized junctions (Source: HCM 2010)*

| Signalized Intersections | | Non-signalized Intersections | |
|---|---|---|---|
| Delay (s/veh) | LOS | Delay (s/veh) | LOS |
| d<=10 | A | d<=10 | A |
| 10<d<=20 | B | 10<d<=15 | B |
| 20<d<=35 | C | 15<d<=25 | C |
| 35<d<=55 | D | 25<d<=35 | D |
| 55<d<=80 | E | 35<d<=50 | E |
| >80 | F | >50 | F |

Generally, LOS D is considered as accepted for junctions in urban areas. However, while overall LOS is D or better, single movements can have a LOS E or F. In case more than one traffic movements in a junction in the same peak hour has LOS F, the problem should be addressed, and if possible, a workable solution should be proposed.

# 5 Results

In the tables below, AM stands for morning peak hour and PM for afternoon peak hour. When the junction is oversaturated, the calculation of queues and delays will get theoretical, because the queue build-up in an oversaturated junction is not predictable and cannot be shown precisely in any model calculation. Therefore, we have decided to show the average delay per vehicle above 200 sec. as >200 sec. and max. queue above 1000 m as >999 m.

## 5.1 The Northern Junction – Höfðabakki/Bíldshöfði

The maximum queue lengths and the average delays for the northern junction are given in Table 3. Further capacity calculation details can be found in Appendix A.

*Table 3: Maximum queue length [m] and average delay [sec] in the northern junction Höfðabakki/Bíldshöfði in the different scenarios. Red marking at queue length indicates critical queue. The colours for the delay refer to Table 1 and 2.*

| Northern Junction | Queue Length [m] | | | | Delay [sec.] | | | |
|---|---|---|---|---|---|---|---|---|
| | Scen. A | | Scen. B | | Scen. A | | Scen. B | |
| | AM | PM | AM | PM | AM | PM | AM | PM |
| **South approach: Höfdabakki** | | | | | | | | |
| Left | 140 | 290 | 140 | 290 | 71 | >200 | 71 | >200 |
| Straight | 200 | 740 | 130 | 650 | 20 | >200 | 17 | 178 |
| Right | 200 | 730 | 20 | 10 | 26 | >200 | 8 | 22 |
| **East approach: Höfdabakki** | | | | | | | | |
| Left | 30 | 440 | 30 | 440 | 54 | >200 | 54 | >200 |
| Straight | 20 | 40 | 20 | 40 | 39 | 31 | 39 | 31 |
| Right | 20 | 40 | 20 | 40 | 43 | 36 | 43 | 36 |
| **North approach: Höfdabakki** | | | | | | | | |
| Left | 20 | 20 | 20 | 20 | 44 | 41 | 44 | 41 |
| Straight | 150 | 120 | 150 | 120 | 21 | 22 | 21 | 22 |
| Right | 130 | 110 | 130 | 110 | 25 | 29 | 25 | 29 |
| **West approach: Bildshöfdi** | | | | | | | | |
| Left | 20 | 180 | 20 | 180 | 45 | 171 | 45 | 171 |
| Straight | 10 | 10 | 10 | 10 | 38 | 37 | 38 | 37 |
| Right | 50 | 150 | 50 | 150 | 26 | 34 | 26 | 34 |
| **Total Average Delay [sec.]** | | | | | **27** | **183** | **24** | **170** |
| **LOS for junction** | | | | | **C** | **F** | **C** | **F** |

The distances from the northern junction to surrounding junctions are:

- Towards south about 150 meters to the highway junction.
- Towards north about 160 meters to the junction at Dvergshöfdi.
- Towards east about 60 meters to the road splits for the parking area.
- Towards west about 550 meters to the junction with Breiðhöfdi.

The junction performs at an acceptable level of service (LOS) in the morning peak hours in both scenarios, where LOS is E for one traffic movement, while all the remaining movements has LOS D or better. The overall LOS is C in both scenarios. The queue on southern approach is however longer in Scenario A (without a slip lane) compared to Scenario B (with slip lane). The queue magazine is around 150 m on the southern approach, and therefore the max queue length is marked with red for straight and right turning movements.

In the afternoon peak hours, the junction capacity is insufficient in both scenarios. Several traffic movements perform at LOS F and the overall LOS is also F. Queues are critical mainly on southern and eastern approaches.

As several traffic movements has shortage of capacity, the recommendation will be a geometric extension of the junction to achieve a better LOS in the afternoon peak periods.

Slip lane on the southern approach does have an effect on the capacity, but this effect is not significant. Especially in the afternoon the effect is limited, as the volumes of right turning traffic is lower compared to the morning peak periods.

## 5.2 The Southern Junction – Höfðabakki/Bæjarháls

The maximum queue lengths and the average delays for the southern junction are given in Table 4. Further capacity calculation details can be found in Appendix A.

*Table 4: Maximum queue length [m] and average delay [sec] in the southern junction Höfðabakki/Bæjarháls in the different scenarios. Red marking at queue length indicates critical queue. The colours for the delay refer to Table 1 and 2.*

| Southern Junction | Queue Length [m] | | | | | | | | | | Delay [sec.] | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Scen. C | | Scen. D | | Scen. E | | Scen. F | | Scen. G | | Scen. C | | Scen. D | | Scen. E | | Scen. F | | Scen. G | |
| | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM |
| **South approach: Höfdabakki** | | | | | | | | | | | | | | | | | | | | |
| Left | 30 | 20 | 30 | 20 | 30 | 20 | 30 | 20 | 30 | 20 | 83 | 76 | 83 | 76 | 83 | 74 | 67 | 58 | 58 | 56 |
| Straight | 720 | 480 | 720 | 481 | 710 | 370 | 100 | 80 | 100 | 90 | >200 | >200 | >200 | >200 | >200 | >200 | 39 | 36 | 39 | 45 |
| Right | 690 | 260 | 140 | 100 | 690 | 360 | 50 | 50 | 70 | 50 | >200 | 129 | 34 | 26 | >200 | 197 | 8 | 9 | 10 | 11 |
| **East approach: Bæjarháls** | | | | | | | | | | | | | | | | | | | | |
| Left | 400 | 800 | 400 | 800 | 400 | 800 | 390 | 790 | 390 | 790 | 186 | >200 | 186 | >200 | 186 | >200 | 178 | >200 | 178 | >200 |
| Straight | 400 | 800 | 400 | 800 | 400 | 800 | 390 | 790 | 390 | 790 | >200 | >200 | >200 | >200 | >200 | >200 | >200 | >200 | >200 | >200 |
| Right | 80 | 240 | 80 | 240 | 80 | 240 | 80 | 240 | 40 | 70 | 25 | 92 | 25 | 92 | 25 | 92 | 25 | 92 | 9 | 9 |
| **North approach: Höfdabakki** | | | | | | | | | | | | | | | | | | | | |
| Left | 50 | 250 | 50 | 250 | 50 | 250 | 50 | 250 | 170 | 810 | 56 | >200 | 56 | >200 | 56 | >200 | 56 | >200 | 153 | >200 |
| Straight | 790 | 920 | 790 | 920 | 790 | 920 | 790 | 920 | 200 | 420 | >200 | >200 | >200 | >200 | >200 | >200 | >200 | >200 | 42 | 150 |
| Right | 790 | 920 | 790 | 920 | 790 | 920 | 790 | 920 | 200 | 420 | >200 | >200 | >200 | >200 | >200 | >200 | >200 | >200 | 52 | >200 |
| **West approach: Bæjarháls** | | | | | | | | | | | | | | | | | | | | |
| Left | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 20 | 43 | 60 | 43 | 60 | 43 | 60 | 43 | 60 | 48 | 56 |
| Straight | 50 | 390 | 50 | 390 | 50 | 390 | 50 | 390 | 70 | 310 | 41 | >200 | 41 | >200 | 41 | >200 | 41 | >200 | 66 | >200 |
| Right | 50 | 390 | 50 | 390 | 50 | 390 | 50 | 390 | 70 | 310 | 47 | >200 | 47 | >200 | 47 | >200 | 47 | >200 | 72 | >200 |
| **Total Average Delay [sec.]** | | | | | | | | | | | >200 | >200 | >200 | >200 | >200 | >200 | 128 | >200 | 70 | >200 |
| **LOS for junction** | | | | | | | | | | | F | F | F | F | F | F | F | F | E | F |

The distances from the southern junction to surrounding junctions are:

- Towards south about 970 meters to the junction with Stekkjarbakki.
- Towards north about 300 meters to the highway junction.
- Towards east about 210 meters to the junction with Bitruháls.
- Towards west more than 900 meters to the nearest junction.

The junction does not have sufficient capacity in any of the scenarios and will be highly congested. Several conflicting traffic movements have LOS F, and the overall LOS is F with very high average delays, beside scenario G AM which performs at an overall LOS E. Only the western approach performs at an acceptable LOS in the morning peak periods in almost all scenarios.

The southern approach performs at an acceptable LOS in scenarios F and G, where a slip lane from south is provided. The slip lane has thus a high impact on traffic management in the southern junction, as the volume of right turning traffic is high in both peak periods. The southern approach performs also better in scenario D, but the overall LOS remains unchanged at F.

The northern approach performs better in AM peak hour in scenario G, where one additional straight going lane is provided, by reducing one left turning lane. But the effect disappears in the PM peak hours, as the left turning volumes is much higher in the PM peak.

Queues are critical mainly on eastern and northern approaches, and on the southern approach in the scenario C and E.

As several traffic movements has shortage of capacity, the recommendation will be a geometric extension of the junction to achieve a better LOS in both peak periods.

# Appendix A: Capacity calculation details

## Scenario A1: Northern Junction, AM peak hour, without slip lane

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total | HV ] | Arrival Flows [ Total | HV ] | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue [ Veh. | Dist ] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | veh/h | % | veh/h | % | v/c | sec | | veh | m |
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 325 | 5,0 | 325 | 5,0 | *0,960 | 70,9 | LOS E | 19,4 | 141,5 |
| 2 | T1 | All MCs | 1097 | 5,0 | 1097 | 5,0 | *0,775 | 19,9 | LOS B | 27,0 | 197,2 |
| 3 | R2 | All MCs | 379 | 5,0 | 379 | 5,0 | 0,775 | 25,6 | LOS C | 26,4 | 192,9 |
| Approach | | | 1801 | 5,0 | 1801 | 5,0 | 0,960 | 30,3 | LOS C | 27,0 | 197,2 |
| East: Höfdabakki | | | | | | | | | | | |
| 4 | L2 | All MCs | 69 | 5,0 | 69 | 5,0 | 0,667 | 54,2 | LOS D | 3,3 | 24,2 |
| 5 | T1 | All MCs | 22 | 5,0 | 22 | 5,0 | 0,180 | 38,5 | LOS D | 1,8 | 13,0 |
| 6 | R2 | All MCs | 22 | 5,0 | 22 | 5,0 | 0,180 | 42,8 | LOS D | 1,8 | 13,0 |
| Approach | | | 114 | 5,0 | 114 | 5,0 | 0,667 | 48,9 | LOS D | 3,3 | 24,2 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 44 | 5,0 | 44 | 5,0 | 0,131 | 43,6 | LOS D | 1,6 | 12,0 |
| 8 | T1 | All MCs | 1623 | 5,0 | 1623 | 5,0 | 0,667 | 20,5 | LOS C | 20,5 | 149,5 |
| 9 | R2 | All MCs | 92 | 5,0 | 92 | 5,0 | 0,667 | 25,0 | LOS C | 17,5 | 128,0 |
| Approach | | | 1759 | 5,0 | 1759 | 5,0 | 0,667 | 21,3 | LOS C | 20,5 | 149,5 |
| West: Bildshöfdi | | | | | | | | | | | |
| 10 | L2 | All MCs | 60 | 5,0 | 60 | 5,0 | *0,319 | 45,4 | LOS D | 2,5 | 18,5 |
| 11 | T1 | All MCs | 33 | 5,0 | 33 | 5,0 | 0,130 | 38,0 | LOS D | 1,3 | 9,5 |
| 12 | R2 | All MCs | 212 | 5,0 | 212 | 5,0 | 0,312 | 25,9 | LOS C | 6,6 | 47,9 |
| Approach | | | 304 | 5,0 | 304 | 5,0 | 0,319 | 31,1 | LOS C | 6,6 | 47,9 |
| All Vehicles | | | 3978 | 5,0 | 3978 | 5,0 | 0,960 | 26,9 | LOS C | 27,0 | 197,2 |

## Scenario A2: Northern Junction, PM peak hour, without slip lane

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total | HV ] | Arrival Flows [ Total | HV ] | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue [ Veh. | Dist ] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | veh/h | % | veh/h | % | v/c | sec | | veh | m |
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 374 | 5,0 | 374 | 5,0 | *1,172 | 214,6 | LOS F | 39,3 | 287,2 |
| 2 | T1 | All MCs | 1738 | 5,0 | 1738 | 5,0 | *1,176 | 201,9 | LOS F | 100,5 | 734,0 |
| 3 | R2 | All MCs | 131 | 5,0 | 131 | 5,0 | 1,176 | 207,5 | LOS F | 99,8 | 728,9 |
| Approach | | | 2242 | 5,0 | 2242 | 5,0 | 1,176 | 204,3 | LOS F | 100,5 | 734,0 |
| East: Höfdabakki | | | | | | | | | | | |
| 4 | L2 | All MCs | 223 | 5,0 | 223 | 5,0 | 2,580 | 1479,5 | LOS F | 60,0 | 438,2 |
| 5 | T1 | All MCs | 65 | 5,0 | 65 | 5,0 | 0,332 | 31,4 | LOS C | 5,3 | 38,5 |
| 6 | R2 | All MCs | 77 | 5,0 | 77 | 5,0 | 0,332 | 35,7 | LOS D | 5,3 | 38,5 |
| Approach | | | 365 | 5,0 | 365 | 5,0 | 2,580 | 917,0 | LOS F | 60,0 | 438,2 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 46 | 5,0 | 46 | 5,0 | 0,145 | 41,2 | LOS D | 1,8 | 12,8 |
| 8 | T1 | All MCs | 1206 | 5,0 | 1206 | 5,0 | 0,579 | 22,4 | LOS C | 15,4 | 112,6 |
| 9 | R2 | All MCs | 135 | 5,0 | 135 | 5,0 | 0,579 | 28,8 | LOS C | 14,9 | 108,6 |
| Approach | | | 1387 | 5,0 | 1387 | 5,0 | 0,579 | 23,7 | LOS C | 15,4 | 112,6 |
| West: Bildshöfdi | | | | | | | | | | | |
| 10 | L2 | All MCs | 269 | 5,0 | 269 | 5,0 | *1,109 | 171,3 | LOS F | 24,7 | 180,3 |
| 11 | T1 | All MCs | 41 | 5,0 | 41 | 5,0 | 0,093 | 37,4 | LOS D | 1,4 | 10,4 |
| 12 | R2 | All MCs | 577 | 5,0 | 577 | 5,0 | 0,726 | 34,2 | LOS C | 20,7 | 150,8 |
| Approach | | | 887 | 5,0 | 887 | 5,0 | 1,109 | 76,0 | LOS E | 24,7 | 180,3 |
| All Vehicles | | | 4882 | 5,0 | 4882 | 5,0 | 2,580 | 183,0 | LOS F | 100,5 | 734,0 |

## Scenario B1: Northern Junction, AM peak hour, with slip lane

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total | HV ] | Arrival Flows [ Total | HV ] | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue [ Veh. | Dist ] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | veh/h | % | veh/h | % | v/c | sec | | veh | m |
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 325 | 5,0 | 325 | 5,0 | *0,960 | 70,9 | LOS E | 19,4 | 141,5 |
| 2 | T1 | All MCs | 1097 | 5,0 | 1097 | 5,0 | 0,591 | 17,1 | LOS B | 17,5 | 127,5 |
| 3 | R2 | All MCs | 379 | 5,0 | 379 | 5,0 | 0,258 | 7,6 | LOS A | 2,0 | 14,4 |
| Approach | | | 1801 | 5,0 | 1801 | 5,0 | 0,960 | 24,8 | LOS C | 19,4 | 141,5 |
| East: Höfdabakki | | | | | | | | | | | |
| 4 | L2 | All MCs | 69 | 5,0 | 69 | 5,0 | 0,667 | 54,1 | LOS D | 3,3 | 24,2 |
| 5 | T1 | All MCs | 22 | 5,0 | 22 | 5,0 | 0,180 | 38,5 | LOS D | 1,8 | 13,0 |
| 6 | R2 | All MCs | 22 | 5,0 | 22 | 5,0 | 0,180 | 42,8 | LOS D | 1,8 | 13,0 |
| Approach | | | 114 | 5,0 | 114 | 5,0 | 0,667 | 48,9 | LOS D | 3,3 | 24,2 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 44 | 5,0 | 44 | 5,0 | 0,131 | 43,6 | LOS D | 1,6 | 12,0 |
| 8 | T1 | All MCs | 1623 | 5,0 | 1623 | 5,0 | *0,667 | 20,5 | LOS C | 20,5 | 149,5 |
| 9 | R2 | All MCs | 92 | 5,0 | 92 | 5,0 | 0,667 | 25,0 | LOS C | 17,5 | 128,0 |
| Approach | | | 1759 | 5,0 | 1759 | 5,0 | 0,667 | 21,3 | LOS C | 20,5 | 149,5 |
| West: Bildshöfdi | | | | | | | | | | | |
| 10 | L2 | All MCs | 60 | 5,0 | 60 | 5,0 | *0,319 | 45,4 | LOS D | 2,5 | 18,5 |
| 11 | T1 | All MCs | 33 | 5,0 | 33 | 5,0 | 0,130 | 38,0 | LOS D | 1,3 | 9,5 |
| 12 | R2 | All MCs | 212 | 5,0 | 212 | 5,0 | 0,312 | 25,9 | LOS C | 6,6 | 47,9 |
| Approach | | | 304 | 5,0 | 304 | 5,0 | 0,319 | 31,1 | LOS C | 6,6 | 47,9 |
| All Vehicles | | | 3978 | 5,0 | 3978 | 5,0 | 0,960 | 24,4 | LOS C | 20,5 | 149,5 |

## Scenario B2: Northern Junction, PM peak hour, with slip lane

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total veh/h | Demand Flows HV ] % | Arrival Flows [ Total veh/h | Arrival Flows HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% Back Of Queue [ Veh. veh | 95% Back Of Queue Dist ] m |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 374 | 5,0 | 374 | 5,0 | *1,172 | 214,6 | LOS F | 39,3 | 287,2 |
| 2 | T1 | All MCs | 1738 | 5,0 | 1738 | 5,0 | *1,137 | 177,8 | LOS F | 89,2 | 650,9 |
| 3 | R2 | All MCs | 131 | 5,0 | 131 | 5,0 | 0,092 | 22,3 | LOS C | 0,6 | 4,1 |
| Approach | | | 2242 | 5,0 | 2242 | 5,0 | 1,172 | 174,8 | LOS F | 89,2 | 650,9 |
| East: Höfdabakki | | | | | | | | | | | |
| 4 | L2 | All MCs | 223 | 5,0 | 223 | 5,0 | 2,580 | 1479,5 | LOS F | 60,0 | 438,2 |
| 5 | T1 | All MCs | 65 | 5,0 | 65 | 5,0 | 0,332 | 31,4 | LOS C | 5,3 | 38,5 |
| 6 | R2 | All MCs | 77 | 5,0 | 77 | 5,0 | 0,332 | 35,7 | LOS D | 5,3 | 38,5 |
| Approach | | | 365 | 5,0 | 365 | 5,0 | 2,580 | 917,0 | LOS F | 60,0 | 438,2 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 46 | 5,0 | 46 | 5,0 | 0,145 | 41,2 | LOS D | 1,8 | 12,8 |
| 8 | T1 | All MCs | 1206 | 5,0 | 1206 | 5,0 | 0,579 | 22,4 | LOS C | 15,4 | 112,6 |
| 9 | R2 | All MCs | 135 | 5,0 | 135 | 5,0 | 0,579 | 28,8 | LOS C | 14,9 | 108,6 |
| Approach | | | 1387 | 5,0 | 1387 | 5,0 | 0,579 | 23,7 | LOS C | 15,4 | 112,6 |
| West: Bildshöfdi | | | | | | | | | | | |
| 10 | L2 | All MCs | 269 | 5,0 | 269 | 5,0 | *1,109 | 171,3 | LOS F | 24,7 | 180,3 |
| 11 | T1 | All MCs | 41 | 5,0 | 41 | 5,0 | 0,093 | 37,4 | LOS D | 1,4 | 10,4 |
| 12 | R2 | All MCs | 577 | 5,0 | 577 | 5,0 | 0,726 | 34,2 | LOS C | 20,7 | 150,8 |
| Approach | | | 887 | 5,0 | 887 | 5,0 | 1,109 | 76,0 | LOS E | 24,7 | 180,3 |
| All Vehicles | | | 4882 | 5,0 | 4882 | 5,0 | 2,580 | 169,5 | LOS F | 89,2 | 650,9 |

## Scenario C1: Southern Junction, AM peak hour, without slip lane

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total veh/h | Demand Flows HV ] % | Arrival Flows [ Total veh/h | Arrival Flows HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% Back Of Queue [ Veh. veh | 95% Back Of Queue Dist ] m |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 79 | 5,0 | 79 | 5,0 | *0,792 | 82,5 | LOS F | 3,9 | 28,5 |
| 2 | T1 | All MCs | 617 | 5,0 | 617 | 5,0 | 1,436 | 461,8 | LOS F | 97,8 | 713,6 |
| 3 | R2 | All MCs | 597 | 5,0 | 597 | 5,0 | 1,426 | 444,8 | LOS F | 93,7 | 683,7 |
| Approach | | | 1293 | 5,0 | 1293 | 5,0 | 1,436 | 430,8 | LOS F | 97,8 | 713,6 |
| East: Bæjarháls | | | | | | | | | | | |
| 4 | L2 | All MCs | 568 | 5,0 | 568 | 5,0 | 1,240 | 185,7 | LOS F | 54,2 | 395,9 |
| 5 | T1 | All MCs | 95 | 5,0 | 95 | 5,0 | *1,240 | 266,3 | LOS F | 54,2 | 395,9 |
| 6 | R2 | All MCs | 386 | 5,0 | 386 | 5,0 | 0,776 | 25,2 | LOS C | 10,9 | 79,4 |
| Approach | | | 1049 | 5,0 | 1049 | 5,0 | 1,240 | 133,9 | LOS F | 54,2 | 395,9 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 262 | 5,0 | 262 | 5,0 | 0,822 | 56,2 | LOS E | 6,4 | 46,9 |
| 8 | T1 | All MCs | 702 | 5,0 | 702 | 5,0 | *1,345 | 353,9 | LOS F | 107,9 | 788,0 |
| 9 | R2 | All MCs | 57 | 5,0 | 57 | 5,0 | 1,345 | 359,5 | LOS F | 107,9 | 788,0 |
| Approach | | | 1021 | 5,0 | 1021 | 5,0 | 1,345 | 277,8 | LOS F | 107,9 | 788,0 |
| West: Strengur | | | | | | | | | | | |
| 10 | L2 | All MCs | 84 | 5,0 | 84 | 5,0 | 0,325 | 43,1 | LOS D | 3,4 | 25,1 |
| 11 | T1 | All MCs | 71 | 5,0 | 71 | 5,0 | 0,652 | 40,9 | LOS D | 7,3 | 53,3 |
| 12 | R2 | All MCs | 96 | 5,0 | 96 | 5,0 | *0,652 | 46,6 | LOS D | 7,3 | 53,3 |
| Approach | | | 251 | 5,0 | 251 | 5,0 | 0,652 | 43,8 | LOS D | 7,3 | 53,3 |
| All Vehicles | | | 3614 | 5,0 | 3614 | 5,0 | 1,436 | 274,5 | LOS F | 107,9 | 788,0 |

## Scenario C2: Southern Junction, PM peak hour, without slip lane

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total veh/h | Demand Flows HV ] % | Arrival Flows [ Total veh/h | Arrival Flows HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% Back Of Queue [ Veh. veh | 95% Back Of Queue Dist ] m |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 62 | 5,0 | 62 | 5,0 | 0,519 | 75,6 | LOS E | 2,9 | 20,9 |
| 2 | T1 | All MCs | 539 | 5,0 | 539 | 5,0 | 1,246 | 292,7 | LOS F | 65,9 | 481,0 |
| 3 | R2 | All MCs | 444 | 5,0 | 444 | 5,0 | 1,062 | 129,1 | LOS F | 35,5 | 259,4 |
| Approach | | | 1045 | 5,0 | 1045 | 5,0 | 1,246 | 210,3 | LOS F | 65,9 | 481,0 |
| East: Bæjarháls | | | | | | | | | | | |
| 4 | L2 | All MCs | 786 | 5,0 | 786 | 5,0 | 1,626 | 414,6 | LOS F | 109,8 | 801,8 |
| 5 | T1 | All MCs | 81 | 5,0 | 81 | 5,0 | *1,626 | 610,7 | LOS F | 109,8 | 801,8 |
| 6 | R2 | All MCs | 539 | 5,0 | 539 | 5,0 | 1,040 | 91,5 | LOS F | 33,2 | 242,5 |
| Approach | | | 1406 | 5,0 | 1406 | 5,0 | 1,626 | 302,1 | LOS F | 109,8 | 801,8 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 482 | 5,0 | 482 | 5,0 | *1,344 | 368,0 | LOS F | 34,2 | 249,6 |
| 8 | T1 | All MCs | 751 | 5,0 | 751 | 5,0 | *1,424 | 424,3 | LOS F | 125,9 | 919,1 |
| 9 | R2 | All MCs | 54 | 5,0 | 54 | 5,0 | 1,424 | 429,9 | LOS F | 125,9 | 919,1 |
| Approach | | | 1286 | 5,0 | 1286 | 5,0 | 1,424 | 403,4 | LOS F | 125,9 | 919,1 |
| West: Strengur | | | | | | | | | | | |
| 10 | L2 | All MCs | 80 | 5,0 | 80 | 5,0 | 0,335 | 59,6 | LOS E | 3,3 | 24,2 |
| 11 | T1 | All MCs | 176 | 5,0 | 176 | 5,0 | *1,419 | 442,4 | LOS F | 53,0 | 387,0 |
| 12 | R2 | All MCs | 165 | 5,0 | 165 | 5,0 | 1,419 | 447,0 | LOS F | 53,0 | 387,0 |
| Approach | | | 421 | 5,0 | 421 | 5,0 | 1,419 | 371,5 | LOS F | 53,0 | 387,0 |
| All Vehicles | | | 4159 | 5,0 | 4159 | 5,0 | 1,626 | 317,4 | LOS F | 125,9 | 919,1 |

## Scenario D1: Southern Junction, AM peak hour, without slip lane, with updated signals

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total veh/h | HV ] % | Arrival Flows [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% Back Of Queue [ Veh. veh | Dist ] m |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 79 | 5,0 | 79 | 5,0 | *0,792 | 82,5 | LOS F | 3,9 | 28,5 |
| 2 | T1 | All MCs | 617 | 5,0 | 617 | 5,0 | 1,436 | 461,8 | LOS F | 97,8 | 713,6 |
| 3 | R2 | All MCs | 597 | 5,0 | 597 | 5,0 | 0,666 | 33,5 | LOS C | 19,6 | 143,3 |
| Approach | | | 1293 | 5,0 | 1293 | 5,0 | 1,436 | 240,9 | LOS F | 97,8 | 713,6 |
| East: Bæjarháls | | | | | | | | | | | |
| 4 | L2 | All MCs | 568 | 5,0 | 568 | 5,0 | 1,240 | 185,7 | LOS F | 54,2 | 395,9 |
| 5 | T1 | All MCs | 95 | 5,0 | 95 | 5,0 | *1,240 | 266,3 | LOS F | 54,2 | 395,9 |
| 6 | R2 | All MCs | 386 | 5,0 | 386 | 5,0 | 0,776 | 25,2 | LOS C | 10,9 | 79,4 |
| Approach | | | 1049 | 5,0 | 1049 | 5,0 | 1,240 | 133,9 | LOS F | 54,2 | 395,9 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 262 | 5,0 | 262 | 5,0 | 0,822 | 56,2 | LOS E | 6,4 | 46,9 |
| 8 | T1 | All MCs | 702 | 5,0 | 702 | 5,0 | *1,345 | 353,9 | LOS F | 107,9 | 788,0 |
| 9 | R2 | All MCs | 57 | 5,0 | 57 | 5,0 | 1,345 | 359,5 | LOS F | 107,9 | 788,0 |
| Approach | | | 1021 | 5,0 | 1021 | 5,0 | 1,345 | 277,8 | LOS F | 107,9 | 788,0 |
| West: Strengur | | | | | | | | | | | |
| 10 | L2 | All MCs | 84 | 5,0 | 84 | 5,0 | 0,325 | 43,1 | LOS D | 3,4 | 25,1 |
| 11 | T1 | All MCs | 71 | 5,0 | 71 | 5,0 | 0,652 | 40,9 | LOS D | 7,3 | 53,3 |
| 12 | R2 | All MCs | 96 | 5,0 | 96 | 5,0 | *0,652 | 46,6 | LOS D | 7,3 | 53,3 |
| Approach | | | 251 | 5,0 | 251 | 5,0 | 0,652 | 43,8 | LOS D | 7,3 | 53,3 |
| All Vehicles | | | 3614 | 5,0 | 3614 | 5,0 | 1,436 | 206,6 | LOS F | 107,9 | 788,0 |

## Scenario D2: Southern Junction, PM peak hour, without slip lane, with updated signals

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total veh/h | HV ] % | Arrival Flows [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% Back Of Queue [ Veh. veh | Dist ] m |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 62 | 5,0 | 62 | 5,0 | 0,519 | 75,6 | LOS E | 2,9 | 20,9 |
| 2 | T1 | All MCs | 539 | 5,0 | 539 | 5,0 | 1,246 | 292,7 | LOS F | 65,9 | 481,0 |
| 3 | R2 | All MCs | 444 | 5,0 | 444 | 5,0 | 0,495 | 26,2 | LOS C | 12,9 | 94,4 |
| Approach | | | 1045 | 5,0 | 1045 | 5,0 | 1,246 | 166,6 | LOS F | 65,9 | 481,0 |
| East: Bæjarháls | | | | | | | | | | | |
| 4 | L2 | All MCs | 786 | 5,0 | 786 | 5,0 | 1,626 | 414,6 | LOS F | 109,8 | 801,8 |
| 5 | T1 | All MCs | 81 | 5,0 | 81 | 5,0 | *1,626 | 610,7 | LOS F | 109,8 | 801,8 |
| 6 | R2 | All MCs | 539 | 5,0 | 539 | 5,0 | 1,040 | 91,5 | LOS F | 33,2 | 242,5 |
| Approach | | | 1406 | 5,0 | 1406 | 5,0 | 1,626 | 302,1 | LOS F | 109,8 | 801,8 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 482 | 5,0 | 482 | 5,0 | *1,344 | 368,0 | LOS F | 34,2 | 249,6 |
| 8 | T1 | All MCs | 751 | 5,0 | 751 | 5,0 | *1,424 | 424,3 | LOS F | 125,9 | 919,1 |
| 9 | R2 | All MCs | 54 | 5,0 | 54 | 5,0 | 1,424 | 429,9 | LOS F | 125,9 | 919,1 |
| Approach | | | 1286 | 5,0 | 1286 | 5,0 | 1,424 | 403,4 | LOS F | 125,9 | 919,1 |
| West: Strengur | | | | | | | | | | | |
| 10 | L2 | All MCs | 80 | 5,0 | 80 | 5,0 | 0,335 | 59,6 | LOS E | 3,3 | 24,2 |
| 11 | T1 | All MCs | 176 | 5,0 | 176 | 5,0 | *1,419 | 442,4 | LOS F | 53,0 | 387,0 |
| 12 | R2 | All MCs | 165 | 5,0 | 165 | 5,0 | 1,419 | 447,0 | LOS F | 53,0 | 387,0 |
| Approach | | | 421 | 5,0 | 421 | 5,0 | 1,419 | 371,5 | LOS F | 53,0 | 387,0 |
| All Vehicles | | | 4159 | 5,0 | 4159 | 5,0 | 1,626 | 306,4 | LOS F | 125,9 | 919,1 |

## Scenario E1: Southern Junction, AM peak hour, without slip lane, with updated geometry

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total veh/h | HV ] % | Arrival Flows [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% Back Of Queue [ Veh. veh | Dist ] m |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 79 | 5,0 | 79 | 5,0 | *0,792 | 82,5 | LOS F | 3,9 | 28,5 |
| 2 | T1 | All MCs | 617 | 5,0 | 617 | 5,0 | 1,431 | 457,4 | LOS F | 96,9 | 707,4 |
| 3 | R2 | All MCs | 597 | 5,0 | 597 | 5,0 | 1,431 | 448,8 | LOS F | 94,6 | 690,4 |
| Approach | | | 1293 | 5,0 | 1293 | 5,0 | 1,431 | 430,5 | LOS F | 96,9 | 707,4 |
| East: Bæjarháls | | | | | | | | | | | |
| 4 | L2 | All MCs | 568 | 5,0 | 568 | 5,0 | 1,240 | 185,7 | LOS F | 54,2 | 395,9 |
| 5 | T1 | All MCs | 95 | 5,0 | 95 | 5,0 | *1,240 | 266,3 | LOS F | 54,2 | 395,9 |
| 6 | R2 | All MCs | 386 | 5,0 | 386 | 5,0 | 0,776 | 25,2 | LOS C | 10,9 | 79,4 |
| Approach | | | 1049 | 5,0 | 1049 | 5,0 | 1,240 | 133,9 | LOS F | 54,2 | 395,9 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 262 | 5,0 | 262 | 5,0 | 0,822 | 56,2 | LOS E | 6,4 | 46,9 |
| 8 | T1 | All MCs | 702 | 5,0 | 702 | 5,0 | *1,345 | 353,9 | LOS F | 107,9 | 788,0 |
| 9 | R2 | All MCs | 57 | 5,0 | 57 | 5,0 | 1,345 | 359,5 | LOS F | 107,9 | 788,0 |
| Approach | | | 1021 | 5,0 | 1021 | 5,0 | 1,345 | 277,8 | LOS F | 107,9 | 788,0 |
| West: Strengur | | | | | | | | | | | |
| 10 | L2 | All MCs | 84 | 5,0 | 84 | 5,0 | 0,325 | 43,1 | LOS D | 3,4 | 25,1 |
| 11 | T1 | All MCs | 71 | 5,0 | 71 | 5,0 | 0,652 | 40,9 | LOS D | 7,3 | 53,3 |
| 12 | R2 | All MCs | 96 | 5,0 | 96 | 5,0 | *0,652 | 46,6 | LOS D | 7,3 | 53,3 |
| Approach | | | 251 | 5,0 | 251 | 5,0 | 0,652 | 43,8 | LOS D | 7,3 | 53,3 |
| All Vehicles | | | 3614 | 5,0 | 3614 | 5,0 | 1,431 | 274,4 | LOS F | 107,9 | 788,0 |

## Scenario E2: Southern Junction, PM peak hour, without slip lane, with updated geometry

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total | HV ] | Arrival Flows [ Total | HV ] | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue [ Veh. | Dist ] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | veh/h | % | veh/h | % | v/c | sec | | veh | m |
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 62 | 5,0 | 62 | 5,0 | 0,519 | 74,2 | LOS E | 2,9 | 20,9 |
| 2 | T1 | All MCs | 539 | 5,0 | 539 | 5,0 | 1,152 | 209,4 | LOS F | 50,1 | 365,9 |
| 3 | R2 | All MCs | 444 | 5,0 | 444 | 5,0 | 1,152 | 197,2 | LOS F | 49,4 | 360,7 |
| Approach | | | 1045 | 5,0 | 1045 | 5,0 | 1,152 | 196,1 | LOS F | 50,1 | 365,9 |
| East: Bæjarháls | | | | | | | | | | | |
| 4 | L2 | All MCs | 786 | 5,0 | 786 | 5,0 | 1,626 | 414,6 | LOS F | 109,8 | 801,8 |
| 5 | T1 | All MCs | 81 | 5,0 | 81 | 5,0 | *1,626 | 610,7 | LOS F | 109,8 | 801,8 |
| 6 | R2 | All MCs | 539 | 5,0 | 539 | 5,0 | 1,040 | 91,5 | LOS F | 33,2 | 242,5 |
| Approach | | | 1406 | 5,0 | 1406 | 5,0 | 1,626 | 302,1 | LOS F | 109,8 | 801,8 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 482 | 5,0 | 482 | 5,0 | *1,344 | 368,0 | LOS F | 34,2 | 249,6 |
| 8 | T1 | All MCs | 751 | 5,0 | 751 | 5,0 | *1,424 | 424,3 | LOS F | 125,9 | 919,1 |
| 9 | R2 | All MCs | 54 | 5,0 | 54 | 5,0 | 1,424 | 429,9 | LOS F | 125,9 | 919,1 |
| Approach | | | 1286 | 5,0 | 1286 | 5,0 | 1,424 | 403,4 | LOS F | 125,9 | 919,1 |
| West: Strengur | | | | | | | | | | | |
| 10 | L2 | All MCs | 80 | 5,0 | 80 | 5,0 | 0,335 | 59,6 | LOS E | 3,3 | 24,2 |
| 11 | T1 | All MCs | 176 | 5,0 | 176 | 5,0 | *1,419 | 442,4 | LOS F | 53,0 | 387,0 |
| 12 | R2 | All MCs | 165 | 5,0 | 165 | 5,0 | 1,419 | 447,0 | LOS F | 53,0 | 387,0 |
| Approach | | | 421 | 5,0 | 421 | 5,0 | 1,419 | 371,5 | LOS F | 53,0 | 387,0 |
| All Vehicles | | | 4159 | 5,0 | 4159 | 5,0 | 1,626 | 313,8 | LOS F | 125,9 | 919,1 |

## Scenario F1: Southern Junction, AM peak hour, with slip lane

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total | HV ] | Arrival Flows [ Total | HV ] | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue [ Veh. | Dist ] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | veh/h | % | veh/h | % | v/c | sec | | veh | m |
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 79 | 5,0 | 79 | 5,0 | *0,792 | 66,6 | LOS E | 3,9 | 28,5 |
| 2 | T1 | All MCs | 617 | 5,0 | 617 | 5,0 | 0,693 | 38,8 | LOS D | 13,2 | 96,4 |
| 3 | R2 | All MCs | 597 | 5,0 | 597 | 5,0 | 0,433 | 7,8 | LOS A | 6,7 | 49,1 |
| Approach | | | 1293 | 5,0 | 1293 | 5,0 | 0,792 | 26,2 | LOS C | 13,2 | 96,4 |
| East: Bæjarháls | | | | | | | | | | | |
| 4 | L2 | All MCs | 568 | 5,0 | 568 | 5,0 | 1,228 | 177,8 | LOS F | 52,6 | 383,9 |
| 5 | T1 | All MCs | 95 | 5,0 | 95 | 5,0 | *1,228 | 256,1 | LOS F | 52,6 | 383,9 |
| 6 | R2 | All MCs | 386 | 5,0 | 386 | 5,0 | 0,776 | 25,2 | LOS C | 10,9 | 79,4 |
| Approach | | | 1049 | 5,0 | 1049 | 5,0 | 1,228 | 128,7 | LOS F | 52,6 | 383,9 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 262 | 5,0 | 262 | 5,0 | 0,822 | 56,2 | LOS E | 6,4 | 46,9 |
| 8 | T1 | All MCs | 702 | 5,0 | 702 | 5,0 | *1,345 | 353,9 | LOS F | 107,9 | 788,0 |
| 9 | R2 | All MCs | 57 | 5,0 | 57 | 5,0 | 1,345 | 359,5 | LOS F | 107,9 | 788,0 |
| Approach | | | 1021 | 5,0 | 1021 | 5,0 | 1,345 | 277,8 | LOS F | 107,9 | 788,0 |
| West: Strengur | | | | | | | | | | | |
| 10 | L2 | All MCs | 84 | 5,0 | 84 | 5,0 | 0,325 | 43,1 | LOS D | 3,4 | 25,1 |
| 11 | T1 | All MCs | 71 | 5,0 | 71 | 5,0 | 0,652 | 40,9 | LOS D | 7,3 | 53,3 |
| 12 | R2 | All MCs | 96 | 5,0 | 96 | 5,0 | *0,652 | 46,6 | LOS D | 7,3 | 53,3 |
| Approach | | | 251 | 5,0 | 251 | 5,0 | 0,652 | 43,8 | LOS D | 7,3 | 53,3 |
| All Vehicles | | | 3614 | 5,0 | 3614 | 5,0 | 1,345 | 128,3 | LOS F | 107,9 | 788,0 |

## Scenario F2: Southern Junction, PM peak hour, with slip lane

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total | HV ] | Arrival Flows [ Total | HV ] | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue [ Veh. | Dist ] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | veh/h | % | veh/h | % | v/c | sec | | veh | m |
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 62 | 5,0 | 62 | 5,0 | 0,519 | 58,2 | LOS E | 2,9 | 20,9 |
| 2 | T1 | All MCs | 539 | 5,0 | 539 | 5,0 | 0,595 | 35,5 | LOS D | 10,9 | 79,4 |
| 3 | R2 | All MCs | 444 | 5,0 | 444 | 5,0 | 0,344 | 9,2 | LOS A | 6,1 | 44,6 |
| Approach | | | 1045 | 5,0 | 1045 | 5,0 | 0,595 | 25,7 | LOS C | 10,9 | 79,4 |
| East: Bæjarháls | | | | | | | | | | | |
| 4 | L2 | All MCs | 786 | 5,0 | 786 | 5,0 | 1,610 | 401,7 | LOS F | 107,6 | 785,5 |
| 5 | T1 | All MCs | 81 | 5,0 | 81 | 5,0 | *1,610 | 596,5 | LOS F | 107,6 | 785,5 |
| 6 | R2 | All MCs | 539 | 5,0 | 539 | 5,0 | 1,040 | 91,5 | LOS F | 33,2 | 242,5 |
| Approach | | | 1406 | 5,0 | 1406 | 5,0 | 1,610 | 294,0 | LOS F | 107,6 | 785,5 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 482 | 5,0 | 482 | 5,0 | *1,344 | 368,0 | LOS F | 34,2 | 249,6 |
| 8 | T1 | All MCs | 751 | 5,0 | 751 | 5,0 | *1,424 | 424,3 | LOS F | 125,9 | 919,1 |
| 9 | R2 | All MCs | 54 | 5,0 | 54 | 5,0 | 1,424 | 429,9 | LOS F | 125,9 | 919,1 |
| Approach | | | 1286 | 5,0 | 1286 | 5,0 | 1,424 | 403,4 | LOS F | 125,9 | 919,1 |
| West: Strengur | | | | | | | | | | | |
| 10 | L2 | All MCs | 80 | 5,0 | 80 | 5,0 | 0,335 | 59,6 | LOS E | 3,3 | 24,2 |
| 11 | T1 | All MCs | 176 | 5,0 | 176 | 5,0 | *1,419 | 442,4 | LOS F | 53,0 | 387,0 |
| 12 | R2 | All MCs | 165 | 5,0 | 165 | 5,0 | 1,419 | 447,0 | LOS F | 53,0 | 387,0 |
| Approach | | | 421 | 5,0 | 421 | 5,0 | 1,419 | 371,5 | LOS F | 53,0 | 387,0 |
| All Vehicles | | | 4159 | 5,0 | 4159 | 5,0 | 1,610 | 268,3 | LOS F | 125,9 | 919,1 |

## Scenario G1: Southern Junction, AM peak hour, without slip lane, with updated geometry

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total | HV ] | Arrival Flows [ Total | HV ] | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue [ Veh. | Dist ] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | veh/h | % | veh/h | % | v/c | sec | | veh | m |
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 79 | 5,0 | 79 | 5,0 | 0,440 | 57,7 | LOS E | 3,5 | 25,2 |
| 2 | T1 | All MCs | 617 | 5,0 | 617 | 5,0 | 0,693 | 38,8 | LOS D | 13,2 | 96,5 |
| 3 | R2 | All MCs | 597 | 5,0 | 597 | 5,0 | 0,457 | 9,6 | LOS A | 9,1 | 66,2 |
| Approach | | | 1293 | 5,0 | 1293 | 5,0 | 0,693 | 26,5 | LOS C | 13,2 | 96,5 |
| East: Bæjarháls | | | | | | | | | | | |
| 4 | L2 | All MCs | 568 | 5,0 | 568 | 5,0 | 1,228 | 178,1 | LOS F | 52,6 | 383,9 |
| 5 | T1 | All MCs | 95 | 5,0 | 95 | 5,0 | *1,228 | 256,1 | LOS F | 52,6 | 383,9 |
| 6 | R2 | All MCs | 386 | 5,0 | 386 | 5,0 | 0,359 | 9,2 | LOS A | 5,8 | 42,4 |
| Approach | | | 1049 | 5,0 | 1049 | 5,0 | 1,228 | 123,0 | LOS F | 52,6 | 383,9 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 262 | 5,0 | 262 | 5,0 | *1,096 | 153,0 | LOS F | 22,7 | 165,5 |
| 8 | T1 | All MCs | 702 | 5,0 | 702 | 5,0 | *0,906 | 41,5 | LOS D | 26,6 | 194,4 |
| 9 | R2 | All MCs | 57 | 5,0 | 57 | 5,0 | 0,906 | 52,2 | LOS D | 26,6 | 194,4 |
| Approach | | | 1021 | 5,0 | 1021 | 5,0 | 1,096 | 70,7 | LOS E | 26,6 | 194,4 |
| West: Strengur | | | | | | | | | | | |
| 10 | L2 | All MCs | 84 | 5,0 | 84 | 5,0 | 0,470 | 48,2 | LOS D | 3,7 | 27,0 |
| 11 | T1 | All MCs | 71 | 5,0 | 71 | 5,0 | *0,958 | 66,2 | LOS E | 9,6 | 70,4 |
| 12 | R2 | All MCs | 96 | 5,0 | 96 | 5,0 | 0,958 | 71,9 | LOS E | 9,6 | 70,4 |
| Approach | | | 251 | 5,0 | 251 | 5,0 | 0,958 | 62,3 | LOS E | 9,6 | 70,4 |
| All Vehicles | | | 3614 | 5,0 | 3614 | 5,0 | 1,228 | 69,5 | LOS E | 52,6 | 383,9 |

## Scenario G2: Southern Junction, PM peak hour, without slip lane, with updated geometry

**Vehicle Movement Performance**

| Mov ID | Turn | Mov Class | Demand Flows [ Total | HV ] | Arrival Flows [ Total | HV ] | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue [ Veh. | Dist ] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | veh/h | % | veh/h | % | v/c | sec | | veh | m |
| South: Höfdabakki | | | | | | | | | | | |
| 1 | L2 | All MCs | 62 | 5,0 | 62 | 5,0 | 0,346 | 56,2 | LOS E | 2,7 | 19,6 |
| 2 | T1 | All MCs | 539 | 5,0 | 539 | 5,0 | 0,776 | 45,2 | LOS D | 12,5 | 91,5 |
| 3 | R2 | All MCs | 444 | 5,0 | 444 | 5,0 | 0,364 | 10,6 | LOS B | 7,2 | 52,6 |
| Approach | | | 1045 | 5,0 | 1045 | 5,0 | 0,776 | 31,2 | LOS C | 12,5 | 91,5 |
| East: Bæjarháls | | | | | | | | | | | |
| 4 | L2 | All MCs | 786 | 5,0 | 786 | 5,0 | 1,610 | 402,1 | LOS F | 107,6 | 785,5 |
| 5 | T1 | All MCs | 81 | 5,0 | 81 | 5,0 | *1,610 | 596,5 | LOS F | 107,6 | 785,5 |
| 6 | R2 | All MCs | 539 | 5,0 | 539 | 5,0 | 0,484 | 9,4 | LOS A | 8,8 | 64,3 |
| Approach | | | 1406 | 5,0 | 1406 | 5,0 | 1,610 | 262,8 | LOS F | 107,6 | 785,5 |
| North: Höfdabakki | | | | | | | | | | | |
| 7 | L2 | All MCs | 482 | 5,0 | 482 | 5,0 | *2,016 | 968,1 | LOS F | 110,7 | 808,1 |
| 8 | T1 | All MCs | 751 | 5,0 | 751 | 5,0 | *1,178 | 150,3 | LOS F | 57,8 | 421,9 |
| 9 | R2 | All MCs | 54 | 5,0 | 54 | 5,0 | 1,178 | 216,4 | LOS F | 57,8 | 421,9 |
| Approach | | | 1286 | 5,0 | 1286 | 5,0 | 2,016 | 459,6 | LOS F | 110,7 | 808,1 |
| West: Strengur | | | | | | | | | | | |
| 10 | L2 | All MCs | 80 | 5,0 | 80 | 5,0 | 0,287 | 56,3 | LOS E | 3,2 | 23,4 |
| 11 | T1 | All MCs | 176 | 5,0 | 176 | 5,0 | *1,248 | 289,3 | LOS F | 41,7 | 304,1 |
| 12 | R2 | All MCs | 165 | 5,0 | 165 | 5,0 | 1,248 | 293,9 | LOS F | 41,7 | 304,1 |
| Approach | | | 421 | 5,0 | 421 | 5,0 | 1,248 | 246,8 | LOS F | 41,7 | 304,1 |
| All Vehicles | | | 4159 | 5,0 | 4159 | 5,0 | 2,016 | 263,8 | LOS F | 110,7 | 808,1 |