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Icelandic Road Infrastructure and Policymaking

***Short compilation for the NPP project Trans Tourism
and the Icelandic Tourism Research Centre***

October 2012

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CONTENTS

	Page
1. INTRODUCTION	1
2. THE ICELANDIC TRANSPORTATION INFRASTRUCTURE (ROADS).....	3
2.1. THE ROAD SYSTEM.....	3
2.2. ROADS, GENERAL INFORMATION AND COMPARISON.....	6
2.3. PUBLIC TRANSPORT	3
3. PLANNING ROAD INFRASTRUCTURE.....	9
3.1. BACKGROUND AND HISTORY	9
3.2. PRESENT TRANSPORTATION PLAN 2011-2022	11
4. REFERENCES.....	17

FIGURES

		Page
Figure 1.	The road network in Iceland 2012	3
Figure 2.	Paved roads at the end of 2011.....	4
Figure 3.	Number of inhabitants per km of road network in 2004	8
Figure 4.	Length of road network (km) per sq. km in 2004	9
Figure 5.	Vehicles per km of roads in 2004	10
Figure 6.	Mountainous areas, elevation above 600 m indicated in orange colour	11
Figure 7.	Road tunnels in 2012, largest bridges and mountain roads.....	1
Figure 8.	The hub and spoke network of Icelandair and its destinations in Europe and North America	2
Figure 9.	Airports with scheduled flight and flight connections 2011.....	3
Figure 10.	The bus system in the capital area	4
Figure 11.	Bus connections by Straeto between Reykjavík and north and west Iceland...	6
Figure 12.	The bus schedule of Kynnisferðir/Reykjavík Excursions, one of Iceland's largest bus companies	7
Figure 13.	An example of a page from the transportation plan 2011-2022.	15

TABLES

		Page
Table 1.	Excerpt from 2012 Fiscal budget; Icelandic Road Administration.....	7

1. INTRODUCTION

This report is prepared for the Icelandic Tourism Research Centre (ITRC) office at the University of Akureyri. The ITRC is a cooperative project between the University of Iceland, the University of Akureyri, Hólar University, The Icelandic Tourist Board and The Icelandic Travel Industry Association. The aim of this co-operation is the improvement and promotion of tourism research in Iceland and strengthening the bonds of research and industry through domestic and international collaborative projects. The aims of the ITRC are to boost research and thus understanding of the impact tourism has on the Icelandic economy, society and environment.

This report is intended to provide a partial input into one of the international projects of the ITRC, funded by the European Union's Northern Periphery Programme (NPP). The project *Trans Tourism* of which the ITRC is a project partner, deals with issues of transportation in rural areas popular with tourists. In summary, the main objectives of the project are:

- Identification of new or improved public transport and transport information solutions and partnerships for sustainable services in rural tourism areas
- Implementation and documentation of the transport solutions, information solutions and planning strategies
- Policy advice on transport planning in rural tourism areas
- Documentation and dissemination of the project results to spread best practise to the Northern Periphery area via seminars, website and other communication channels

This report is part of work package 4 of the project dealing with the implementation of new services and transport solutions. Therein the current approaches to planning for transport in rural tourist areas are to be considered in each partner country with all key organisations involved. The outcome will be joint policy advice which will be a practical help in future

planning of transport in these areas and similar areas in the Northern Periphery.

The report is compiled by Hjalti Jóhannesson and Valtýr Sigurbjarnarson, researchers at RHA – University of Akureyri Research Centre.

2. THE ICELANDIC TRANSPORTATION INFRASTRUCTURE (ROADS)

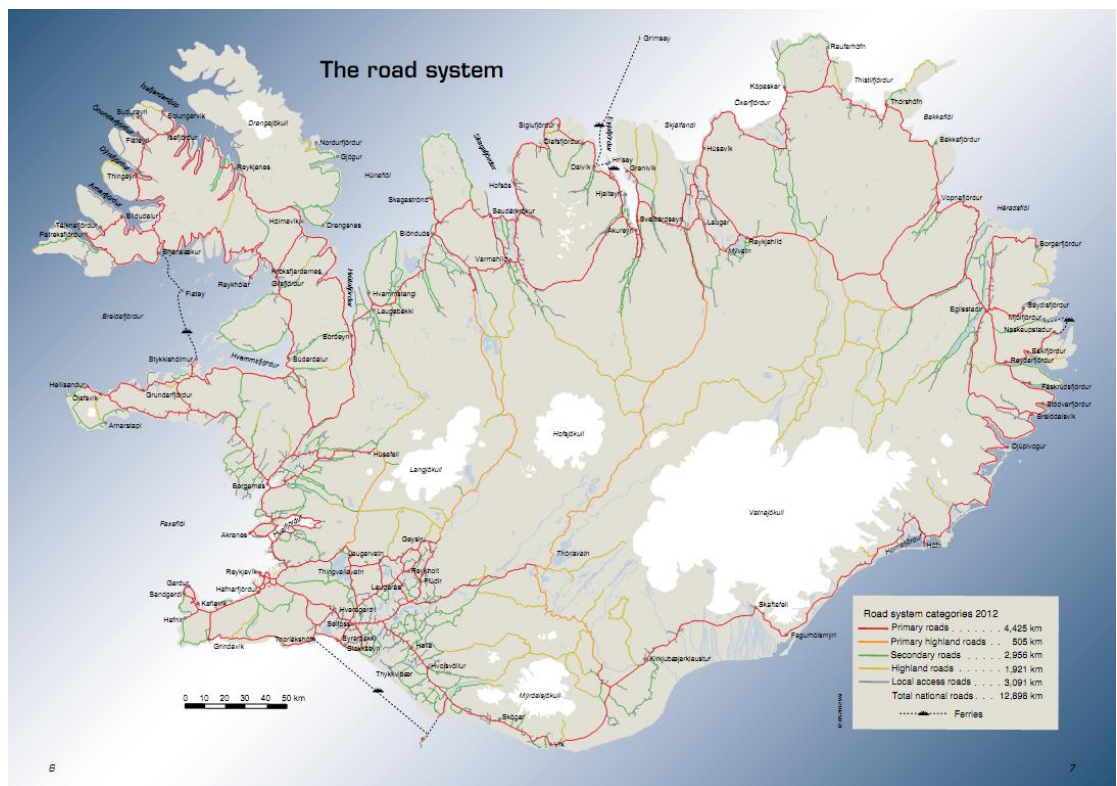
According to the Road Act (2007), Iceland’s road system is categorised into national roads, municipal roads, public paths and private roads. The two first mentioned are to make up a coherent and continuous road system that connects the country’s urban and rural areas.

2.1. The Road System

National roads are for the free travel of the general public. They are categorised into primary roads, primary highland roads (generally closed during winter), secondary roads, local access roads, highland roads (tracks) and ferries.

Primary roads

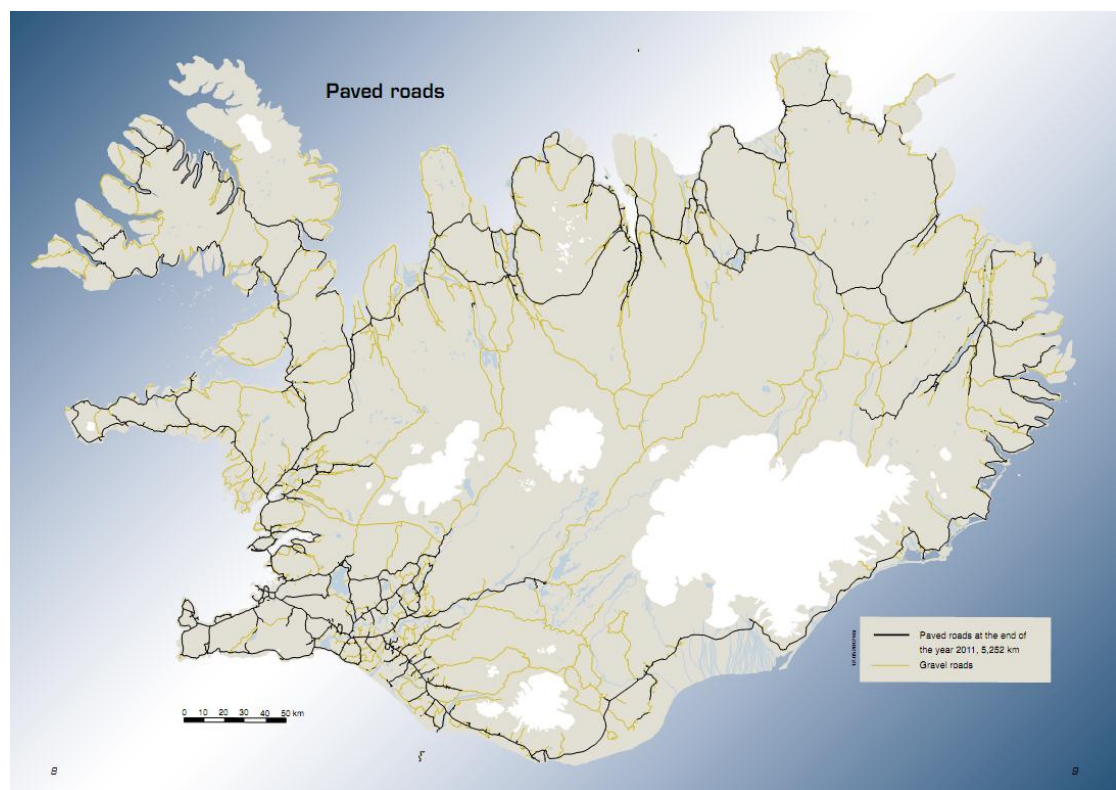
The primary roads (red in figure 1) constitute the backbone of the road system.



Source: The Icelandic Road Administration

Figure 1. The road network in Iceland 2012

The ring-road, or road no. 1, is the primary road that circles the island. As can be seen in figure 2, by now almost all of it is paved and its importance has increased in recent years as nearly all domestic transportation has to use this road after coastal shipping was discontinued in 2004¹. The minister of internal affairs has started work on looking into the possibilities of starting coastal shipping again.



Source: The Icelandic Road Administration

Figure 2. Paved roads at the end of 2011.

Primary roads are a part of the basic transport system and connect the country's urban areas. These, in turn, are connected to villages with a population of 100 inhabitants or more. Roads with substantial traffic connecting municipalities in the metropolitan area are also primary roads. In cases where a primary road ends in a municipality, it stretches as far as the first intersection with a street that belongs to the municipality. In some cases, a primary road connects an airport or a harbour, that is important for cargo transport or tourism.

¹ However, coastal shipping was temporarily offered in the Westfjords again in 2007:
<http://www.bb.is/Pages/26?NewsID=101774>

Primary highland roads

A part of Iceland's basic transport system runs through its highland interior. However these are low maintenance gravel roads without established or built up river crossings and with limited or no services, thus they are closed during winter.

Secondary roads

Secondary roads are roads outside populated areas that connect primary roads or highland roads to a primary road. They can also be roads connecting a village with less than 100 inhabitants to the primary road system or roads to airports and harbours, which are important to cargo transport and tourism, as well as roads to ferry harbours, national parks and their interiors, and popular tourist destinations in rural areas.

Local access roads

Local access roads are roads to places such as farms, factories, churches, public schools and other public places located outside populated areas. They are officially planned and listed in the Road Register. A road can also qualify as a local access road if it connects a group of 30 summer houses or more to a primary or a secondary road.

Highland roads

These are state roads that do not belong to any of the road categories listed above. This category covers roads across mountains. These roads are usually with seasonal traffic and limited services. Like the primary highland roads, these are usually narrow gravel roads or dirt tracks and most rivers are unbridged.

Public and private roads and public paths

The owners of public and private roads are the keepers of these roads. Public roads are owned by the public authorities and can be used freely by the general public. The administrative office for roads in Iceland is the Vegagerðin, The Icelandic Road Administration. Public paths can be for

walking, cycling or riding and are kept by public authorities. Funds for these paths are allocated in the state road budget.

Ferries

Ferries are categorized as a part of the road system in Iceland. The state road budget is authorised to allocate funds to ferries involved in the transport of people and vehicles across straits and fjords, if the ferry substitutes a primary road or link road connection for at least part of the year.

2.2. Roads, general information and comparison

Iceland is a large country compared to population size, the landscape is difficult to traverse with high mountains separating deep fjords, and often long distances between inhabited places. This causes many challenges in providing and maintaining good infrastructure. Not least is this apparent in the road network. The director of the Icelandic Road Administration said at a speech May 19, 2011² that it was estimated that 200-300 billion ISK were needed to upgrade the Icelandic road network so that its quality would be comparable with the road network in countries which Iceland compares itself to generally. However only just over 6 billion ISK will be used for new road projects in 2012 (see Table 1). According to the director, secondary roads needed most upgrading (green in Figure 1). Around 26% of these roads have paved surface.

² Hreinn Haraldsson, director of the Icelandic Road Administration at a meeting for preparation of transportation plan 2011-2022, Radison SAS Hótel Saga, 19 May 2011 (See a broadcast from the meeting <http://straumur.hotelsaga.is/msradisson/Viewer/?peid=2857202b36d749ce8f3c79da8ed4f148>)

Table 1. Excerpt from 2012 Fiscal budget; Icelandic Road Administration

<i>Icelandic Road Administration</i>	<i>Million ISK</i>
General operation:	
1.01 General operation cost	484.0
1.02 Cost of claiming income	81.0
1.05 Regions and units of operation	6,533.0
1.07 Service	3,010.0
1.11 Support to ferries and bus operators	1,197.0
1.12 Support to public transportation in the capital region	350.0
1.13 Support to domestic flight	194.0
1.21 Research	123.0
General operation cost total	11,972.0
Maintenance projects:	
5.10 Maintenance	4,629.0
Construction cost:	
6.10 Construction	6,176.0
Cost total	22,777.0
Cost above income	16,244.0
Special income	-6,533.0
Special income:	
Financing:	
From state budget	544.0
From special state income	15,625.0
Transactions	75.0

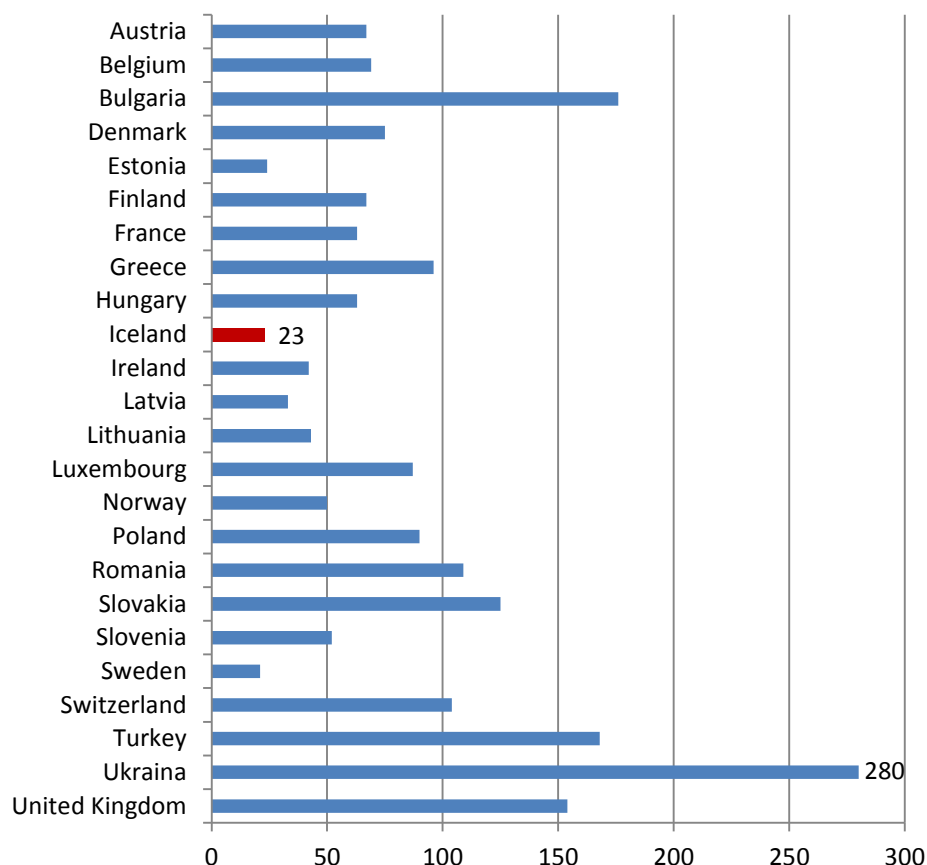
Source: Fjárlög 2012 [2012 Fiscal budget]

An important feature of the Icelandic road network is that no year-round connections are available across the country. The connections across the highland interior are only open during the short Arctic summer and are primarily used for tourism and recreational purposes. Most of these roads are only suited for off-road vehicles.

Due to increasing transportation costs of individuals and businesses in the Westfjords, North- and East Iceland, resulting from rising energy prices and the fact that coastal shipping was discontinued in 2004, there is increasing pressure to shorten distances to and from these provinces, generally to the capital region housing 2/3 of the population. Solutions are being looked into

such as making town by-passes or by creating a year-round connection north-south across the highland interior.

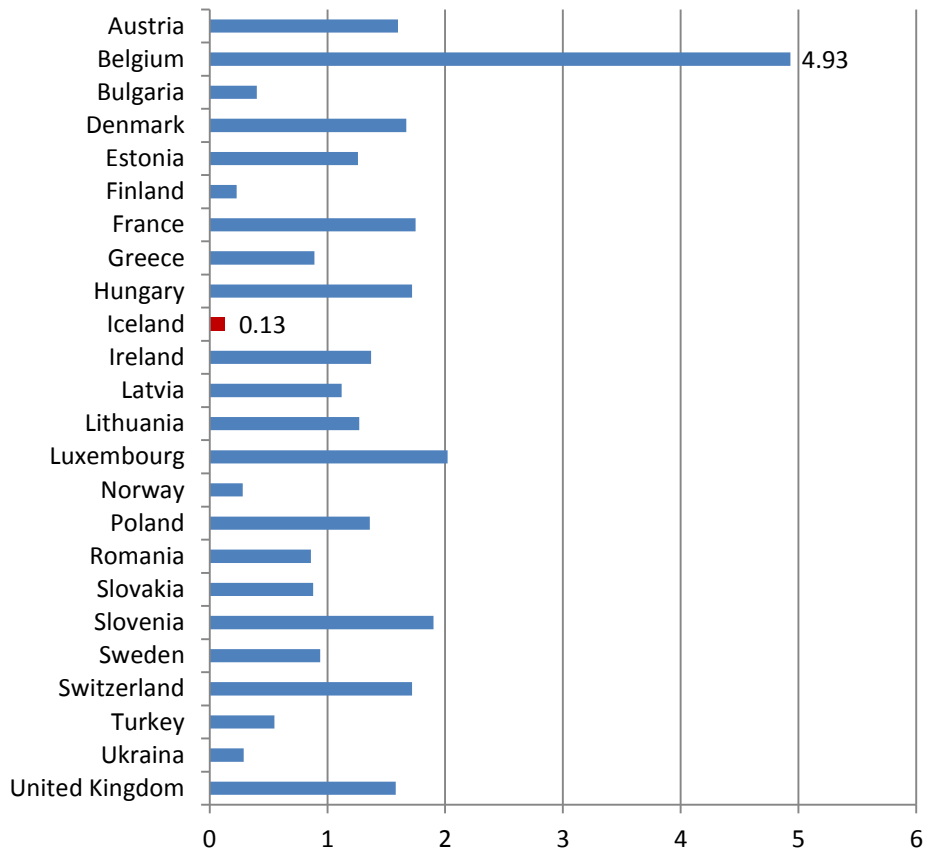
Figure 3 sheds some light on the main differences and similarities between Iceland and a number of other countries when the road network is compared to population size.



Source: The Icelandic ministry of communications (2007)

Figure 3. Number of inhabitants per km of road network in 2004

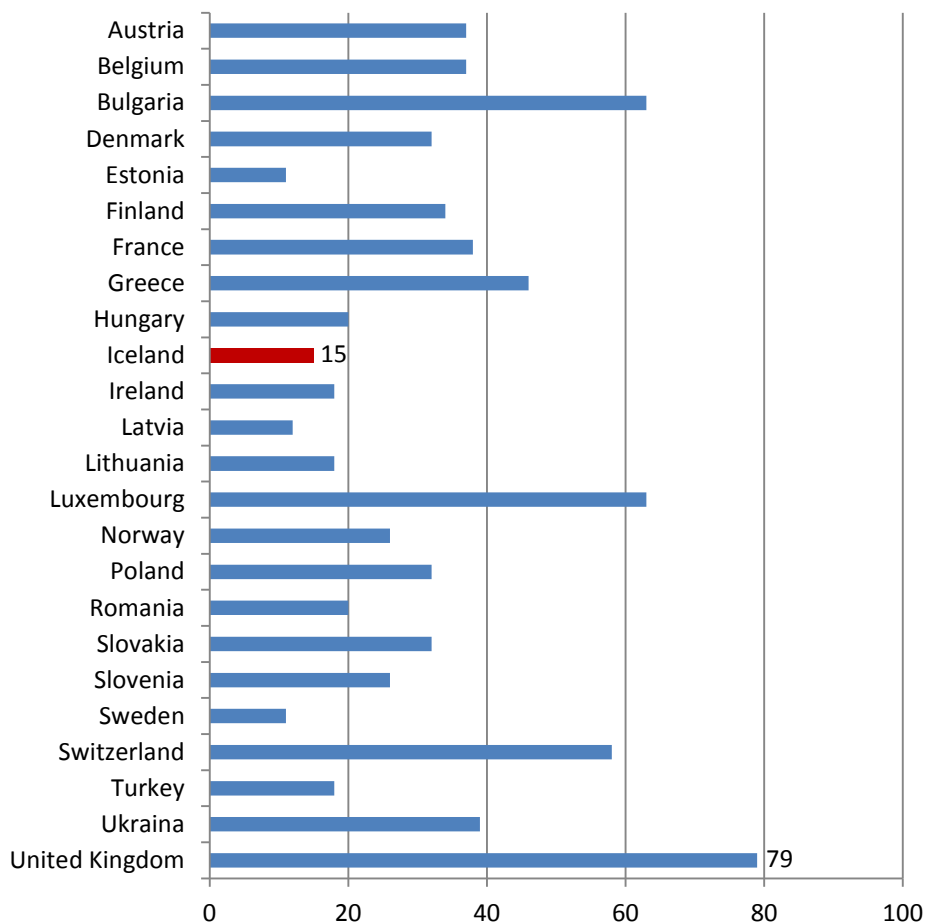
In this comparison one can see how the low population density of Iceland is reflected in the road network and basically the “difficulties” and cost associated with creating a road network for the needs of society inhabiting such a vast territory. The average number of individuals per km of roads in the comparison in figure 3 is 87. Countries with similar conditions as Iceland using this type of measurement are Sweden and Estonia.



Source: The Icelandic ministry of communications (2007)

Figure 4. Length of road network (km) per sq. km in 2004

Similarly the length of road network is very small compared with the size of Iceland (Figure 4). Here we can e.g. see the effects of the uninhabited highland interior which has very limited and seasonally accessible road network. In this comparison, Iceland has the fewest km per sq. km of land area. The average among this group of countries was 1.3 in 2004 and this has probably not changed dramatically during this period.



Source: The Icelandic ministry of communications (2007)

Figure 5. Vehicles per km of roads in 2004

The final comparison of this kind is the number of vehicles per km of roads. Again, Iceland is indicated by a comparatively low number or 15 vehicles per km which is among the lowest, however high rate of car ownership influences this indicator positively³. The indicator is lower or 11 in both Estonia and Sweden. The average number for this indicator is however 33 cars per km of roads in the countries making up the profile.

Road tunnels, mountain roads and bridges

Due to a mountainous terrain in some regions in Iceland, especially in the Westfjords, central north and the east, road tunnels have been considered necessary to secure a year-round road connection. The map in figure 6 shows areas which are 600 m or more above sea level. Other factors of course have

³ 598 passenger cars per 1000 inhabitants in 2004 and 644 in 2010 (source: Static.is).

an impact on the deemed necessity for tunnels, such as steepness of mountain roads, local weather conditions and snow accumulation.

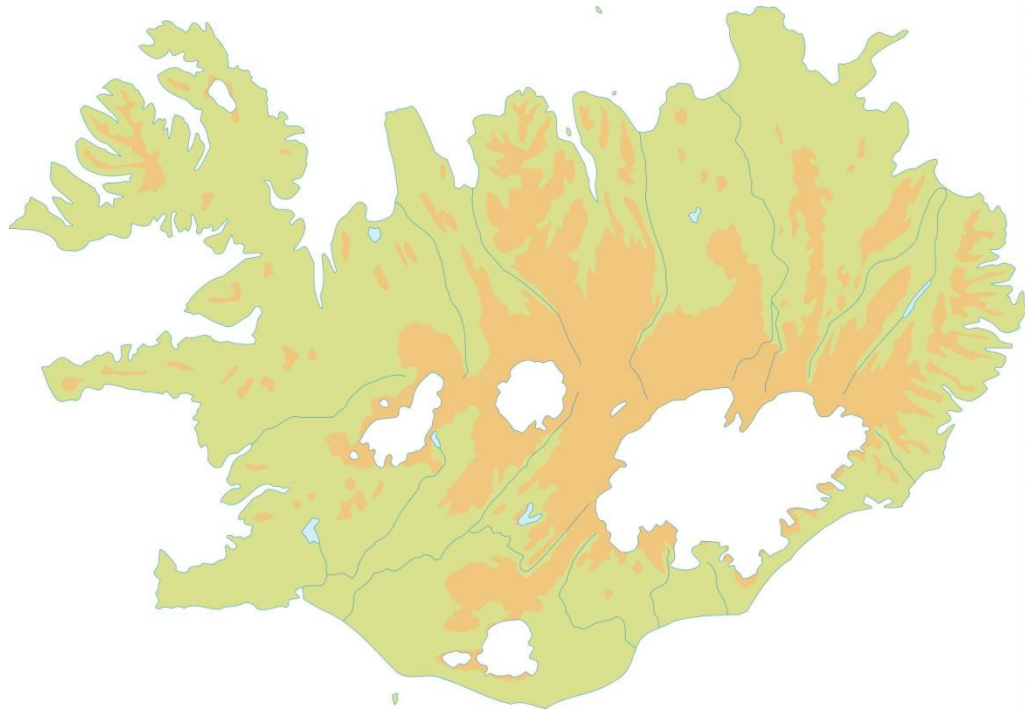


Figure 6. Mountainous areas, elevation above 600 m indicated in orange colour

The map depicted as figure 7 shows road tunnels, key bridges and the heights of selected mountain roads. As can be seen from comparing figure 6 and 7 all the tunnels are located where the landscape is most elevated, i.e. in the Westfjords, central north and the east. However there still exist several difficult mountain roads in these regions. One road tunnel is an exception. The Hvalfjörður tunnel in the west which is a sub-sea tunnel operated as a toll-road⁴ and shortens the distance from the capital to the west and the north by some 50 km.

⁴ The only toll road existing in Iceland today, however another tunnel project through a mountain just east of Akureyri in central north Iceland will be a toll road and is open up for bids (May 2011).

Road tunnels, largest bridges and mountain roads

These pages show an overview of the road tunnels, largest bridges on state roads and some mountain roads. Their size is represented with symbols that are to scale.

Bridges are listed according to length and the surface area. Iceland's longest bridge, across Skeidará, is mostly single-laned, whereas the bridge across Borgarfjörður is double-laned and therefore larger in terms of surface area.

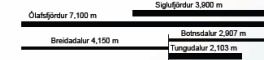
Combined, the two legs of the Héðinsfjörður tunnel make up the longest road tunnel in Iceland. It cuts through the isolated fjord of Héðinsfjörður, connecting the towns of Siglufjörður and Ólafsfjörður. The sub-sea road tunnel under Hvalfjörður is privately owned by Spólur ehf. and operates on a toll basis.

The road over Reynisfjall, close to Vík í Mýrdal, is only 119 meters above sea level, but is still the most elevated road between Hveragerði and Höfn. The highest road elevation is to be found in the interior of Iceland on a road through Sprengisandur, which is 940 meters above sea level.

Road tunnels

Rank	Tunnel Name	Year	Length (m)	Notes
1	Héðinsfjarðargöng	2010	11,000	
2	Breidadal- og Botsheidi	1966	9,160	
3	Fáskrúðsfjardargöng	2005	5,900	
4	Hvalfjörður	1968	5,770	
5	Bolungarvíkurgöng	2010	5,400	
6	Ólafsfjardarmúli	1991	3,400	single lane
7	Almannaskard	2005	1,300	double lane
8	Strákagöng	1987	800	
9	Odds-skard	1977	640	
10	Amarneshamar	1948	30	

Scale 1: 100,000



Longest bridges

Rank	Bridge Name	Year	Length (m)
1	Skeidará	1974	880
2	Borgarfjörður	1979	520
3	Súla	1973	420
4	Ólfusárós	1988	360
5	Gígjukvísl	1988	336
6	Kúdafjöt	1993	302
7	Lagarfjöt	1958	301
8	Hvítá	2010	270
9	Hornafjardarfjöt	1991	254
10	Markarfljöt	1991	250

Scale 1: 10,000

Largest lane area of bridges

Rank	Bridge Name	Year	Area (m²)
1	Borgarfjörður	1979	4,659
2	Skeidará	1974	3,870
3	Hvítá	2010	3,007
4	Gígjukvísl	1988	2,352
5	Ólfusárós	1988	2,340
6	Kúdafjöt	1993	2,114
7	Lagarfjöt	1958	1,806
8	Súla	1973	1,805
9	Markarfljöt	1991	1,750
10	Kolgrafarfjörður	2004	1,744



Source: The Icelandic Road Administration

Figure 7. Road tunnels in 2012, largest bridges and mountain roads

A number of mountain roads become closed due to snow during winter and even a few mountain roads remain closed for the whole duration of the most severe winter months. Among the highest mountain roads, necessary for the year-round connection of inhabited places is Fjarðarheiði 620 m above sea level, providing a road connection for a town in east Iceland, (Seyðisfjörður, 677 inhabitants). The mountain road is also connecting the harbour for Norrøna, the only ferry that connects the Icelandic road system to mainland Europe. Higher mountain roads are usually either found in the highland interior (mainly for tourism) or serve as a second connection to inhabited places.

Yet another challenge associated with creating a road network in Iceland are the many rivers which have been a major hindrance. The ring road was finalized only in 1974 when the large glacial rivers south of the Vatnajökull ice cap were bridged. A special challenge in maintaining these bridges/road connections are floods (jökulhlaups) in the glacial rivers caused e.g. by sub-glacial volcanic activity which can and has ruined these bridges. Figure 7 gives an overview of largest bridges on national roads and some mountain roads. Iceland's longest bridge, across Skeiðará, a glacial river south of Vatnajökull glacier, is mostly single-lane⁵, whereas the bridge across Borgarfjörður in the west is double-lane and therefore larger in terms of surface area.

Connections to domestic and international flights

Nearly all scheduled international flight is operated from Keflavik airport 49 km from downtown Reykjavík. The road connecting the airport to the capital region is a four lane dual carriageway and of the highest standard found in the country. In Akureyri there is scheduled international flight to Copenhagen during the summer. From Reykjavík domestic airport there are also flight connections to Greenland and the Faeroes. In Egilsstaðir in the east the

⁵ Finalized in 1974

airport has served charter flights occasionally and is also a reserve airport for Keflavik airport and shares that duty with Akureyri airport.

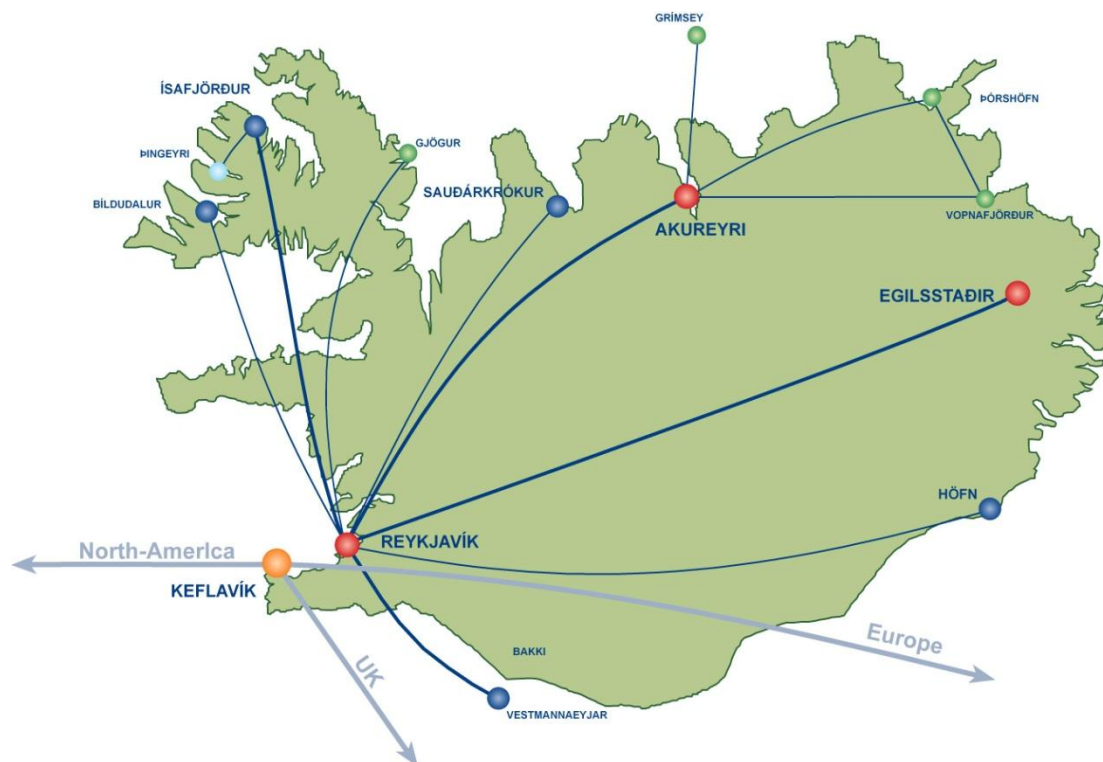


Source: www.icelandair.is

Figure 8. The hub and spoke network of Icelandair and its destinations in Europe and North America

The airport in Keflavik offers quite diverse connections to the outside world especially due to the advanced hub and spoke system that Icelandair has developed during the past decades (Figure 8).

Scheduled domestic flight are operated from a number of airports in regions around the country where the travel distance to Reykjavík is greater than three hours. The air transportation system is centred on Reykjavík which has gradually become the hub in the domestic system. Akureyri has maintained a position as a small hub for three settlements in the north- and northeast (Figure 9).



Source: ISAVIA

Figure 9. Airports with scheduled flight and flight connections 2011

Figure 9 shows all domestic scheduled flight connections in 2011 and the respective airports.

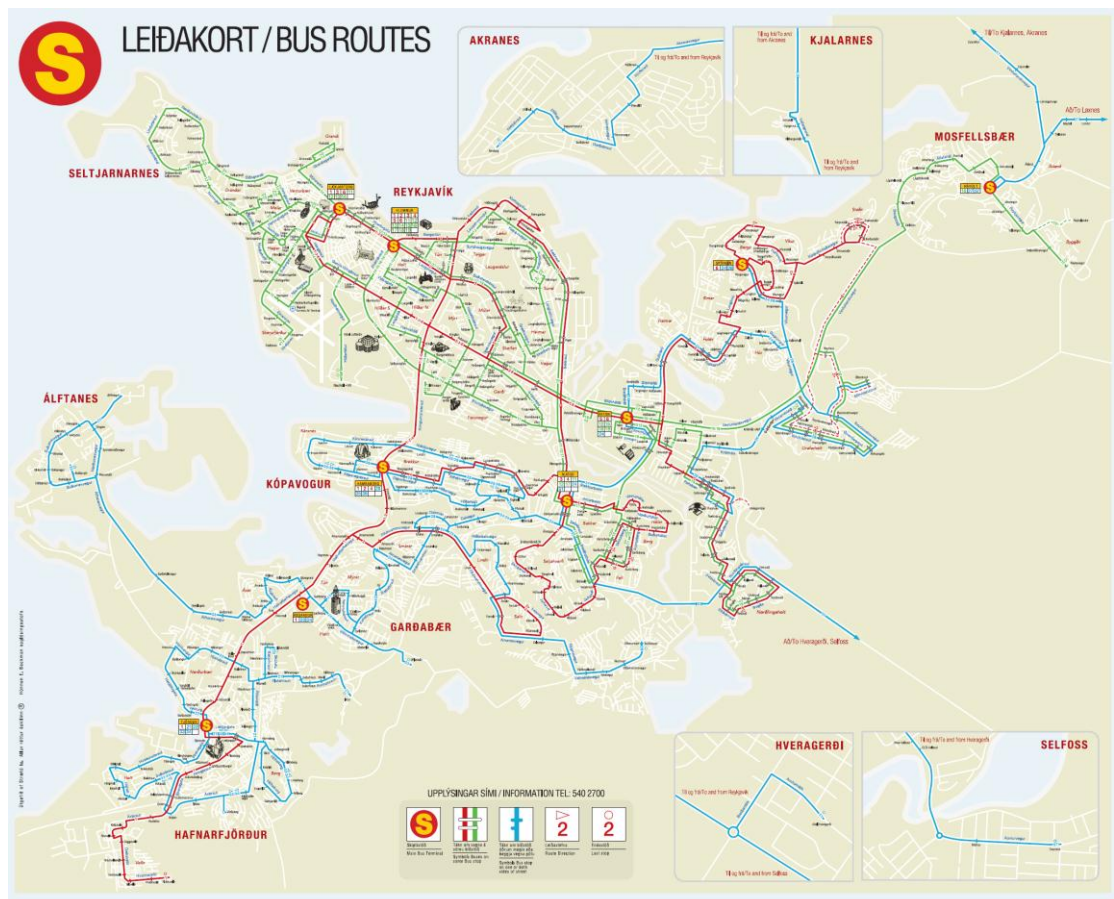
2.3. Public Transport

The history of public transport in Iceland dates back to initiatives in the capital in year 1931. That year, the company Buses Reykjavík Ltd was established. During the early years the business was a private company, which in 1944 was bought of the local authorities in Reykjavík. Now this is a municipally operated co-operative company, named Strætó⁶ owned by seven municipalities in the metropolitan area. The main role of the company is to provide public transport. The strategy is to increase service and quality to its customers, improve public transport and increase their efficiency. The vision is based on that the customers prefer to get their way by bus because it is much more cost effective, environmentally friendly and even faster option than using a private car. The company states in their vision that there exists a

⁶ Icelandic for bus

need to improve information sharing and provide service quality, which entails high level of service, priority in traffic, comfort and safety.

Low population density in the capital region has however been a challenge for developing an efficient public transportation system. The existing one can be seen in figure 10.



Source: <http://www.straeto.is/english>

Figure 10. The bus system in the capital area

The Minister for the interior, the chairman of the association of municipalities in the capital region (SSH) and the director of the Icelandic Road Administration have signed a memorandum of understanding on development projects to promote public transport. As a consequence representatives from the Icelandic Road Administration and municipalities in the capital area have signed an agreement for a 10-year pilot project on the promotion of public transport in the capital area. The purpose of this project is to double the share of public transport in the area, lower transportation costs and greenhouse gas emissions.

The main objective and purpose of the experimental project includes the following:

- Double at least the share of public transport in capital area over the duration of the project.
- Promote a reduction in transportation costs due to traffic and road accidents.
- Contribute to the decline in greenhouse gas emissions in line with the action plan of the Government on climate change.
- Create conditions for the postponement of large investments in infrastructure with a robust public transportation to reduce the growth in traffic on the arterial road network at peak periods.

The contract parties undertake to provide funds for the project as follows:

- The Icelandic Road Administration will contribute 350 million ISK in 2012, subsequently there will be allocated 900 million annually 2013-2021 and 550 million in 2022 to close the operation of public transport in the capital area.
- The owners of the public bus company Strætó commit to an annual contribution to the operation of the company will not be lower during the period than it was in 2012.

Part of the promotion of public transport in the capital region is the promotion of public transport throughout the country. To that effect Strætó bs has been creating a journey planner including the whole of the island and through municipal agreements creating service links around the country. Figure 11 shows the connections extending North and West from the capital region offered through Strætó bs.



Source: <http://www.straeto.is/english>

Figure 11. Bus connections by Strætó between Reykjavík and north and west Iceland.

In early September 2012 the company Hópbílar started organized bus operation between Akureyri and Reykjavík. It offers wireless network inside the busses. So-called real-time maps can be found on the bus that enables customers to view the location of the busses in the system at any given time. Regional associations of municipalities stand behind the operation, but they offered bus operation, carried out by contractor (Hópbílar), between Akureyri and Reykjavík⁷.

There will be two trips daily, seven days a week except Saturdays (one trip). Full fare for adults is 7.700 ISK⁸ but by buying tickets online or in advance the price is 6.600 ISK. The fee for children and adolescents is significantly cheaper or 1.980 ISK for children under 12 years of age and 5.060 ISK for teenagers aged 12-18 years.

The route between Akureyri and Reykjavík is divided into 22 zones (Figure 11) but an odd ticket for an adult costs 300 ISK per zone if purchased 10 tickets,

⁷ Strætó operates contracts with contractors, information and sales network, but financial responsibility for the project lies with the regional organizations in certain proportions. They get passenger revenues and contributions from the Icelandic Road Administration and pay the contractors in accordance with the agreements.

⁸ Approximately 48 EUR Oct. 18 2012.

and then one slip for each zone. These tickets will not be sold on board the bus.

A similar system has been put in place connecting the capital with the south shore of Iceland, extending to the southeast corner town of Höfn. There have been advertised bids for more routes around the country according to the system that has been described above. The aim is to create a synchronised public transport schedule for the whole country and that this will be the general type of public transportation system all over Iceland. The remaining area in this is the East of Iceland, where no agreements have been reached on the public transport service provisions.

Other bus connections

Other bus companies exist around the country but the new bus system described above is likely to change their operations to a large degree. Some of these companies had concessions (at least during a specific time period) on certain routes but now that system is being abolished.

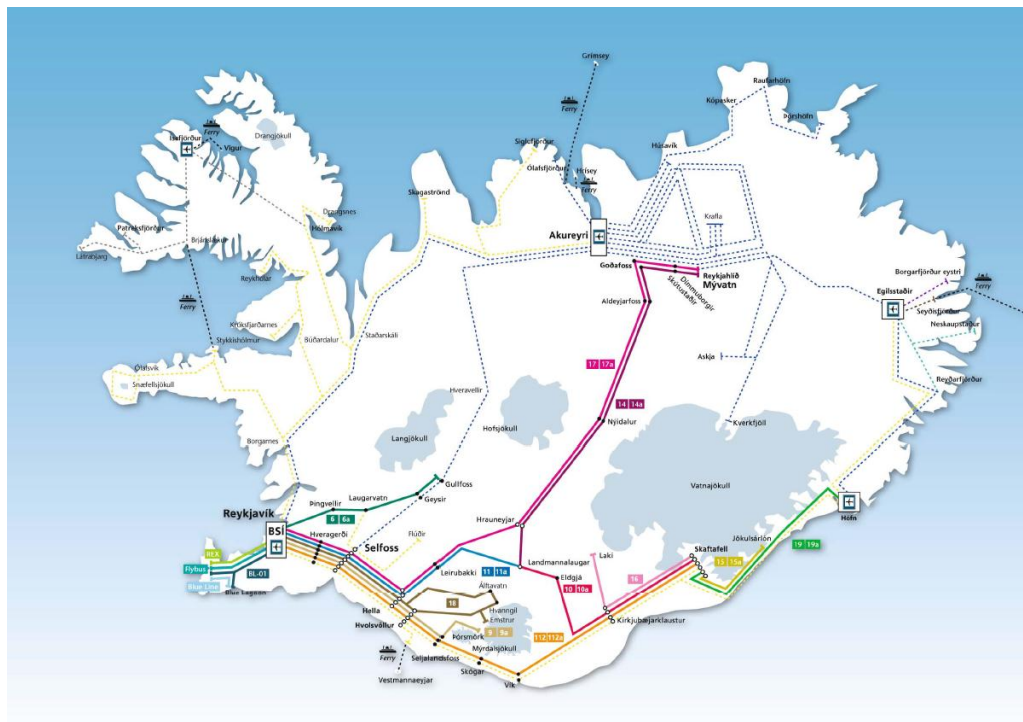


Figure 12. The bus schedule of Kynnisferðir/Reykjavík Excursions, one of Iceland's largest bus companies

Figure 12 shows as an example the major destinations of a large bus company; Kynnisferðir/Reykjavík Excursions outside Reykjavík. The destinations are not major towns but rather various tourist hotspots. When looking at this system of bus transportation it appears that it is not very efficient as a public transportation system for someone who is travelling between towns. The centre of the operation of most bus companies is the Bus terminal in Reykjavík⁹.

⁹ http://bsi.is/index_en.html

3. PLANNING ROAD INFRASTRUCTURE

There is a comparatively short planning tradition of transportation infrastructure in Iceland. Although the case for improvements and the general expansion of the system seems clear cut this is a field which has traditionally caused much debates in Icelandic politics. There has been competition between regions and the constituencies on improved road infrastructure.

3.1. *Background and history*

Decisions about new road and other transport infrastructure are taken at the parliament and passed as parliamentary resolutions. The last specific road infrastructure plan was for the planning period 2000-2004 but since then a comprehensive transportation plan covering all modes of transportation took over instead of each mode of transportation having its specific policy carried out. The road or transportation plan is both a long term plan for 12 years which is rather general in nature and also a plan for each 4 year period which defines more specifically individual projects and their financing.

In 1997 the director of planning at the Icelandic Road Administration (ICERA) summarized how the planning process had been carried out during the previous 20 years in a report to the Icelandic National Audit Office (Jóhannesson and Ólafsson, 2004). The director of ICERA met with politicians from each constituency at least twice when preparing the plan. When prioritizing projects the politicians emphasised two issues qualifying projects to be targeted. On the one hand projects with high economic benefits for the societies being connected and on the other hand projects where the transportation system was in a bad condition or unsafe, posing risk to local inhabitants. The ICERA put forward a lists of projects along with financial estimates according to this consultation and this provided the basis for a parliamentary document (Kristinsson, 1999). Reflecting this were the aims and objectives in the long term road plan towards the end of the 20th century. These were the following (plan discussed in the parliament 1997-1998):

- a) Finish the ring road with paved surface and roads leading to urban settlements with 200 inhabitants or more.
- b) Connect with roads urban settlements with more than 1000 inhabitants each (distance <80 km and shortening compared to other available connections >150 km).
- c) Pave important tourist roads (>200 cars per day in summer).
- d) Reconstruct bridges on main transportation routes (the ring road and connections to it) that are not capable of full loads (European standards).
- e) Widen roads where traffic is so heavy that capacity and traffic safety become a problem.
- f) Reconstruct roads with heavy traffic (>500 cars a day) where pavement was put on old roads without other improvements and have proved to be dangerous.
- g) Widen one lane bridges on the ring road where there is heavy traffic (>400 cars a day).

As can be seen from this list, projects were aimed at addressing very different needs, concerning lack of connections, safety issues and traffic flow. Due to high mountains in the northern and eastern parts of the country very expensive solutions were needed to create good connections between places i.e. road tunnels. This has been very much contested by proponents of the capital area who emphasize widening of roads in that area and traffic safety measurements. This sentiment reflected an occurring change taking place in transport planning attitudes in Iceland towards the end of the millennium. It was becoming increasingly clear that changes were needed to this system, with more factors needed to be incorporated into the decision process. Due to the uneven development of Icelandic regions and the fact that over 63% of the population is living in the capital region the need of that urban area and its immediate hinterland with relatively heavy traffic and commuting between areas have become quite different from the needs of other regions with different transportation needs.

Transportation plan for the period 2003-2014 was the first long term plan to be carried out according to a new Act on transportation planning from 2002 (Act. no. 71/2002) reflecting this change.

3.2. Present transportation plan 2011-2022

The present transportation plan; 2011-2022 is the second long term plan of the kind reflecting the changing role of the capital region in the transport system. According to the parliament the emphases in the field of transportation, according to Act no. 33/2008 on transportation plan, shall be as follows during the period 2011-2022:

- h) Policy in transportation and main objectives defined,
- i) definition of the transportation network that covers the whole country and shall ensure all citizens with good transportation,
- j) plan of financing the transportation system,
- k) overview of costs of all major segments in the operation of transportation institutes, such as maintenance, safety and new infrastructure in the fields of aviation, sea transport and roads¹⁰.

A key change is the professionalization of the development of the transport system, where the role of local politicians safeguarding their constituents has been diminished. According to this new policy the Minister for the interior nominates persons for a transportation council. The transportation council, which includes directors of the transportation institutes that belong to the ministry, and a chairman, directly appointed by the minister, is responsible for preparing the proposals for the transportation plan. Specialists from the ministry and various public sector institutes work together with the council on preparing the plan.

There has also been input from universities, municipalities, the economy and consultants into preparing the transportation plan and subgroups dealing

¹⁰ Parliamentary resolution on transportation plan for the years 2011–2022
<http://www.althingi.is/alttext/140/s/pdf/1630.pdf> visited 10 October 2012.

with specific issues such as: Public transport, impact of EU membership application on transport related issues, revision of safety plans, prioritization of projects, basic network of public transport and bicycle paths, homepage of transport plan, the capital region, integration of plans and environmental issues.

There were five main objectives defined in the transport plan 2011-2022:

1. Easy access
2. Economical transportation system
3. Environmentally sustainable transportation
4. Safety in transportation
5. Positive regional development

These main objectives will be described briefly below and to the main steps to be taken towards fulfilling the objectives.

Objective on easy access (1)

The emphasis here is on accessibility and easy transport of goods and people and that most citizens will be able to access a centre of employment and services within one hour. Centres of employment and services shall be defined in other plans¹¹. Transportation shall strengthen development of service areas in all regions. Harbours and airports that ensure easy access to and from the country shall be defined.

Objective on economical transportation system (2)

Emphasis is placed on economical solutions in construction and operation of the transportation system. Transparent pricing is among these issues. The transportation system shall be viewed as a whole and new infrastructure planned and prioritized according to cost-benefit analysis. Measures to change travel habits in urban settlements will be supported in order to alleviate the need to build new infrastructure.

¹¹ Probably these are the Regional development plans of Iceland 2020 and Iceland's National spatial plan.

Objective on environmentally sustainable transportation (3)

There are several measures put forward in the transportation plan to support this objective. Among these is that release of greenhouse gases will be 23% less in 2020 than they were in 2008 (750,000 tonnes less) according to Icelandic policy. There will be a plan on sustainable transportation in cooperation with municipalities with emphasis on public transport, walking and bicycling. A part of this is to increase local services and lessen the need for the private car. Noise and air pollution from transportation will be gradually lowered and kept within the limits used in EU regulations. Systematic measures shall aim at using less fossil fuels and that the transportation equipment use renewable energy sources and energy saving measures for older equipment. Research shall be increased aiming at sustainable production of environmentally friendly energy sources and increased economy of the transportation system.

Objective on safety in transportation (4)

Safety in transportation shall be systematically increased and during the lifespan of the plan the likelihood of serious accidents and fatal accidents decreased substantially. Safety management system shall be systematically introduced in companies using all modes of transport. Continuing credibility of Iceland shall be insured by passing appraisals of international bodies regarding control of safety issues.

Objective on positive regional development (5)

This is a new addition to the transportation plan. The objective existed however also in the proposal for a long term transportation plan for the period 2007-2018 which was never passed by the parliament. The fact that the transportation system connects people and settlements is emphasized in the current plan. The needs of individual regions for improved transportation to strengthen municipalities, regions and the country in general will be considered in prioritization of transportation projects.

Shortening of travel time, building paved roads and construction of tunnels instead of difficult mountain roads will create better conditions for positive regional development and strengthening of employment and service areas.

Transportation planning shall be intertwined with other planning and public policy. In that way a common future vision can be drawn for all regions to strengthen the economy and quality of life, and to maximize economical use of transportation infrastructure and services.

Presentation of the plan

The transportation plan is issued from the parliament in the form of a resolution, i.e. a declaration of the parliament's policy on the issue, without legislating. The financial part of the plan, i.e. the costs incurred by operation, maintenance and construction is divided into sections, for each mode of transportation. The section outlining the road system and ferries is also divided into sections. These sections of the plan to a large degree coincide with the constituencies of Iceland and the road network is divided into sections each having its specific ID number. One page from this long term transportation plan is presented below. The headings have been translated to give an idea about how the financial part of the plan is presented and the division of financing of larger projects between the four year periods within the long term plan.

On that excerpt (figure 13) we can see how much money in million ISK is estimated for each project. There is also basic information such as on the length of road, and type. For each project there is also a field where it is marked if the project has the purpose of supporting the objectives of safety, accessibility, environmental issues and regional development. This is for the first time this kind of information appears in a long term transportation policy. Most projects adhere to the objectives of accessibility and safety.

Road no.	Section no.	Section name	Section length	Type of road	Cost m. ISK	Per 1 2011-14	Per 2 2015-18	Per 3 2019-22	2023+	Safety	Accessibility	Environment	Regional dev.
Northeast region													
Preparation of projects outside plan													
1		Hringvegur				260	240	240					
p7-p9		Um Akureyri, öryggisaðgerðir		A22			200						
q7		Um Skjálfandafjót	1,7	C8	430		430			X	X		
r6		Jökulsá á Fjöllum	2,6	C8	1.000	50	950			X	X	X	
s7		Um Ysta Rjúkandi	1,0	C8	124	124				X	X	X	
t6		Litla Sandfell-Skriðdalsvegur	11,0	C8	97	97				X	X	X	
t7		Skriðuvatn-Axarvegur	6,0	C8	350		350			X	X	X	
u4-u5		Um Berufjarðarbotn	4,7	C8	800		800			X	X	X	
82		Ólafsfjarðarvegur				50			x	X	X		
05		Snjóflóðavarnir við Saudanes	1,0	C8									
85		Norðausturvegur											
02-03		Um Skjálfandafjót og Tjörn	6,3	C8	1.370			1.370		X	X		
15		Hófskarðsleið	30,0	C8	26	26				X	X	X	
14d		Raufarhafnarleið	14,0	C8	50	50				X	X	X	
24-33		Þistilfjörður-Vopnafjörður		C8	2.400			1.780	x	X	X	X	
40		Tenging Vopnafjarðar	2,6	C8	150	150				X	X	X	
43		Vopnafj.-Brunahvammsháls, Áf.2	38,0	C8	670	670				X	X	X	
93		Seyðisfjarðarvegur											
03		Öryggisaðgerðir		C8			100				X		
94		Borgarfjarðarvegur		C8		100	250	350	x	X	X	X	
96		Suðurfjarðarvegur		C8	2.100			1.560	x	X	X	X	
807		Skíðadalsvegur											
01		Skáldalækur-Brautarhóll	3,6	C7	150	150				X	X		
815		Hörgárdalsvegur											
01		Skriða-Brakandi	4,0	C7	200			200		X	X		

Figure 13. An example of a page from the transportation plan 2011-2022.

4. SUMMARY

The Icelandic road network is extensive, i.e. there has been emphasis on high coverage of the network and Iceland is a relatively large country compared to low population number. The cost of upgrading the Icelandic road network to be comparable with the road network in countries which Iceland compares itself to generally is very high. The main road around the country is the ring road, most of which has a paved surface. An interesting fact is that there is no road connection across the highland interior open all year round. Due to a mountainous terrain in some regions, especially in the Westfjords, central north and the east, expensive road tunnels have been considered necessary to secure a year-round road connection. Nearly all scheduled international flight is operated from Keflavik airport 49 km from Reykjavík. The road connecting the airport to the capital region is a four lane dual carriageway and of the highest standard found in the country. Ferries, domestic flight to remote destinations and the bus system are partly financed through the state budget. Low population density in the capital region has been a challenge for developing an efficient public transportation system, emphasis has been put on strengthening the system in the state transportation plan.

There is a comparatively short planning tradition of transportation infrastructure in Iceland and this is a field which has traditionally caused debates in Icelandic politics. There is competition between regions and the constituencies on improved road infrastructure. Decisions about new road and other transport infrastructure are taken at the parliament and passed as parliamentary resolutions. The present transportation plan; 2011-2022 is the second long term plan of the kind covering all modes of transportation. Its main objectives are; easy access, economical transportation system, environmentally sustainable transportation, safety in transportation and positive regional development. Regarding the objective on accessibility most citizens shall be able to access a centre of employment and services within one hour.

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