

TUNNEL VISIONARY

The societal effects and impacts of
sub-sea tunnels on the Faroe Islands

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tunnels on the Faroe Islands

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Abstract

Long-term, ex post assessments of societal changes and social impacts after a significant reduction of travel constraints are rarely conducted. In the Faroe Islands, two submerged tunnels that replace the previous two busiest ferry routes caused a sheer improvement of accessibility. Two case communities were studied to see how this changed and impacted them. An explorative, mainly qualitative methodology was applied, enriched with supportive quantitative analyses and visualisations. Identified changes include centralisation forces, migration patterns, lifestyle and cultural changes; all of this embodied by increased everyday (auto) mobility. However, a sense of continuity in general and positivity about the tunnel effects prevail. Several mechanisms were identified as to why the overall impact is perceived so limited – including a cultural ‘tunnel vision’ trait that is reflected in infrastructure planning. The methodology was found adequate in answering the research questions.

Keywords: Social impacts, accessibility, fixed links, qualitative spatial analysis

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COVER PAGE: NORÐOYATUNNILIN, KLAKS VíK.

FIGURE 1 (NEXT PAGE). OLD FERRY SAM ENTERS KLAKS VíK PORT AFTER A TRIP TO KALSOY (IN THE BACKGROUND). SHE USED TO PLY THE WATERS BETWEEN VÁGAR AND VESTMANNA UNTIL 2002, AND LATER JOINED THE MAIN FERRY ON THE LEIRVÍK -KLAKS VíK ROUTE. SAM - A SINGLE SHIP REPLACED BY TWO SUB-SEA TUNNELS.



1. Introduction

What happens if two distant friends become neighbours overnight? How do communities respond to a sudden increase in accessibility? And how are changes still visible a decade after a new road opened? In the Faroe Islands, two outward communities were linked or 'added' to the central Mainland in 2002 and 2006. What were ferries before, are sub-sea tunnels now; What required planning, patience and sometimes deep pockets in the past is a quick dash to the other side today. It provides a fertile soil not only to study what has changed, but also how change is experienced in the course of time.

Most research on infrastructure links either focus on impacts on projects' neighbours (e.g. quality of life, NIMBYism) (e.g. Hamersma, 2017) or on economic geographic effects (e.g. Maarseveen & Romijn, 2015; Karlsson, 2011). Transport geographers often look into commuting, migration patterns and functional regions (e.g. Meijer, 2012; Bjarnason, 2014; Odgaard et al., 2014; van Eck, 2006; Lian & Rønnevik, 2010) and the physiological effects of mobility, such as the sense of autonomy and happiness (e.g. Schwanen et al., 2012). Also the link between place identity and infrastructure has been examined (e.g. Baldacchino, 2007). However, no planner has taken a holistic, community-based view towards the societal changes and impacts from large infrastructure. A fresh look at the interactions of various fields is welcome.

This research wants to get a sense of how life in and of the two Faroese communities has changed after the tunnels came. Meanwhile it wants to map to what extent and by which mechanisms the tunnels are responsible for any changes. The research question reads:

How does the sudden reduction of travel constraints impact local societies in the long-term?

This question is operationalised through the following case-specific question:

How has life in two Faroese communities changed after two tunnels connected them to the 'Mainland', and to what extent and through which mechanisms are the tunnels accountable for these changes?

The long-term retrospective character is rarely taken and forms an addition to our understanding of how society responds to changes in transport and infrastructure. Meanwhile the research is an exercise in attempting to isolate the impacts of a single element of change in a complex system of interacting processes, events and developments, which together co-produce societal change. The specific Faroese context, as an island micronation, make changes better visible than elsewhere. The research also

provides a framework for future impact assessments of Faroese projects, since the two existing sub-sea tunnels will not remain the only ones for long.

A qualitative methodology supplemented with quantitative analyses is used to answer the research questions. The point of gravity lies at interviews, but wherever available, secondary quantitative data and literature are used to nuance empirics. A case study by default, two case areas are compared with each other; with their past and present situation; and with the country at large. Overall, the research combines the descriptive and assessing powers of Social Impact Assessments (SIAs) and the explanatory dimension of geographic research.

What's next?

Figure 2 summarises the outline of the next chapters. Its beginning is usual: a discussion of literature, theory and the conceptual model. The case introduction is given in two separate chapters: one for the country in general (the 'Baseline') and one for the two case areas and tunnel projects. The results are discussed in Chapter 6 and partly in Chapter 7, which is labelled 'Observations and Interpretation' and takes a deeper look at the experience of change. Synthesis forms the last chapter, which assembles conclusions, a review of the research process, gaps and outlooks for the future.

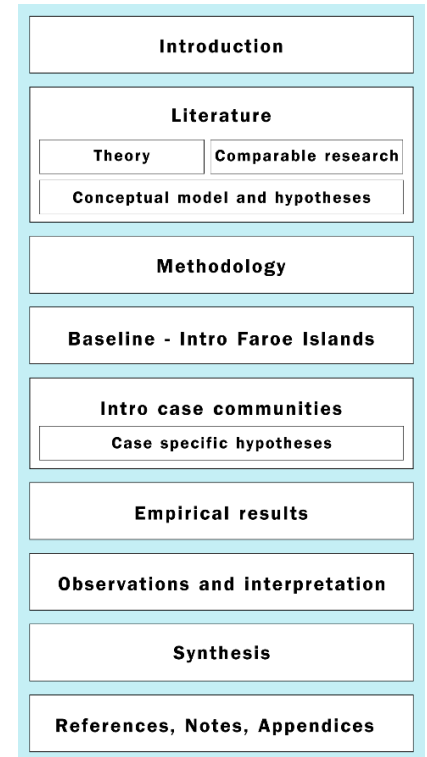


FIGURE 2. RESEARCH OUTLINE

Of three appendices, two go into more detail about two specific sub-analyses; the last contains large-scale maps and visualisations that are referred to throughout the text.

Definitions

Social	Relates to the lives of the case communities and sub-communities. Because individuals' impacts are not discussed in this research, <i>social</i> is interchangeable with <i>community</i> impacts.
Communities	The Mið- and Sandavágur villages ('East Vágur'); and Klaksvík town (including Ánir village).
Effect	A non-impactful change; see next chapter.
Impact	An effect that produces a meaningful change on society, either positively or negatively.
Long-term	≥10 years after opening.
Fixed link	A bridge, causeway or tunnel across a major waterbody.
Mainland	The two central Faroese islands, i.e. Streymoy and Eysturoy. Sometimes Mainland also refers to Vágur and three of the Northern Isles, but this research explicitly chooses not to.

2. Social impacts, transport and fixed-links

This theoretical discussion contains three parts: the theoretical framework, which serves to interpret the case study; a discussion of literature on fixed link's spatial effects; and the conceptual model that summarises the theoretical approach.

2.1 Theoretical framework

Transport geographers recognise three 'classic' constraints to travel: time, costs and effort (Van Wee & Annema, 2009). These are important constituents of how we experience distances between areas. A reduction of the 'friction' of distance generally leads to increased mutual connectivity at social, economic and spatial scales and gives rise to 'time-space compression' or the shrinkage of space (Knowles, 2006). By focussing on tunnels, this research studies both the direct effects of transport's physical appearances and more intangible effects and impacts of accessibility. This section will address the notion of effects and impacts more closely.

Social impact assessment

Social impact assessment (SIA) is concerned with assessing and managing the social issues that are associated with projects, programs or policies (Vanclay & Esteves, 2011). The field emerged after the success of environmental impact assessments (EIAs), which focus on environmental rather than social issues. The purpose of social impact assessments is to come with solutions for negative impacts while using opportunities to enhance positive impacts. Thus, it is not only a matter of mapping, predicting and reviewing, but also an active part of management processes. Traditionally SIAs have been conducted for mineral extraction projects, but they can be applied to any kind of planned intervention or change – from tar sands and wind farms to tourism, nature development and roads.

More and more often initiators of projects are obliged to conduct a SIA beforehand. However, also opponents and third parties can choose to conduct one. They can do this prior to an intervention, as a proactive *ex ante* assessment, or in retrospect, as an evaluative, reactive *ex post* assessment. The latter type cannot directly change management and monitoring cycles but may inspire stakeholders and protocols for improvements.

The focus of SIAs needs to be defined ('scoped') beforehand in terms of region or community, timeframe and type of impacts. After scoping, impact assessments conduct 'profiling' or set a 'baseline'. How is the current community shaped, how is space organised? This stage delivers the frame of reference to which the future (in case of *ex ante*) or past (in case of *ex post* assessment) is compared and impacts are assessed. That is the next stage, which often 'designs' multiple scenarios of how the future could look like or the present could have looked like. After scenario building, the stages of implementation of adaptive strategies, monitoring, reviewing and evaluation take place. Since SIA is a process-oriented rather than content-oriented exercise, the SIA process should be repeated to assess new external pressures and the impacts of the chosen adaptation strategies.

It is difficult to define the word *social*, since almost any economic and environmental impact has social implications. On a semiotic level, not all changes and effects are impacts. Effects are often interpreted as superficial changes while impacts are meaningful changes to the communities in point (Vanclay, 2002; Geurs et al., 2009). Meaning is given by an interaction between various factors, which can be named pressures. Our perception of actions can create impacts much greater than the physical changes, but can also cancel the effects of physical change out. For example, high expectations or anxiety stemming from negative forebodes can make impacts seem bigger than their physical appearances, and should be taken seriously by project initiators (Vanclay, 2012). This research follows the semantic difference between effects and impacts; the word *changes* is used as an overarching term.

Social impacts of transport

Geurs et al. (2009, p.74) introduce a conceptual model for factors that affect social impacts of transport, which consists of four pillars: Land-use, People, Transport and Social Impacts. The characteristics of communities (e.g. structure, needs and desires, assets, culture), of transport (e.g. facilities, relative location in the network) and of the spatial distribution of activities determine if a change in any of these leads to effects. An interaction between the three thus causes or prevents impacts. Important is that social impacts occur primarily on individuals; they experience change and must respond to change first-hand. However, as individuals are member of multiple groups and categories, and since these groups and categories are likely to experience the same impacts, social impacts can aggregate to community-wide impacts. If differences occur between various groups of the community, transport can ultimately feed social (in)justice (Geurs et al., 2009).

To assess impacts of transport, Geurs et al. give five categories of impacts. These include the presence of (1) infrastructure, (2) of vehicles, (3) of transport facilities, services and activities, (4) of traffic; and (5) the opportunity to travel. These categories overarch several impacts, both measurable and immeasurable. Presence of facilities, services and activities is what I would name the ‘usefulness of infrastructure’, that is, are the facilities and services (highway exits, stations, bus systems, cars, petrol stations) in the right places and leading to the right activities to render a piece of infrastructure useful? Presence of infrastructure refers to visual quality, barrier effects and nuisance and is typically subject of impact research (e.g. Hamersma, 2017). Travel refers to the movement of and movement opportunities for members of the community, whereas traffic refers to the physical appearance of travel, such as congestion and road safety concerns.

Types of impacts

Impacts can be categorised by various typologies. On a temporal scale, there are pre-operational, operational and – in the case of finite projects like mines – closure impacts. Pre-operational includes announcement effects (which can cause fear and anxiety), anticipatory effects (e.g. property speculation) and construction effects (e.g. construction workers and traffic) (Vanclay, 2012). No formal delimitation of short, medium and long term exists, being contingent on type of activity and community. In project management, five years after completion is already far beyond any conceivable horizon, while for

societal change, the long term commences no earlier than ten years after opening. The latter definition is used in this research.

Another way of typifying impacts is as direct, indirect and cumulative impacts. Direct impacts can be traced back directly to an element of change; A leads to B. Highways' physical appearance may compromise the night rest and views of neighbours (direct effect), leading to declining property values and adjusted housing migration patterns (indirect effects), which combined with other effects may eventually produce social injustice (cumulative effect). However, if the local population does not care about views or noise, impacts may be suppressed (Hamersma, 2017). Because this particular research is not only interested in the effects of the tunnels proper, but also the impacts of accessibility, accessibility should not be regarded as a direct effect, but as the source of change.

Of special concern for societal change are the cumulative impacts. While some impacts from the pre- and post-opening phases can be characterised as isolated impacts, via psychological processes and hidden causation chains they may collectively produce cumulative impacts (Franks et al., 2011). The introduction of the wage economy in aboriginal communities that comes with new mines is one fine example (Mitchell & Parkins, 2011). Treating a receiving community dishonestly is likely to cause long-lasting negative sentiments towards the project initiator, which could turn detrimental to either party. With increased competition and a loss of services, liveability could be put under pressure, ultimately leading to out-migration and a vicious circle for those who remain.

Complexity

Projects are nested in societies that are complex adaptive systems, which blur any one-to-one cause-effect relationship (Duit & Galaz, 2008). There are no 'independent variables' to which the 'dependent variables' respond; all respond to each other. Countless of parallel trends, developments ('pressures') and feedback mechanisms produce a complex system of interactions. It is these interactions or linkages that produce change, rather than the single element, as also Geurs et al. (2009) imply. It is therefore crucial not to reverse-engineer all changes back to a single project, but to examine the role and weight of context closely. Some interactions 'push' a project towards a success, others hamper positive change, while again others simply co-occur without traceable interference.

Especially when multiple projects co-exist, cumulative impacts may mount up beyond a threshold or 'tipping point', whence the whole system revolts. The tar sands in Alberta, Canada for example have irreversibly changed society's structure and the environment (Franks et al., 2010). It is difficult to assess an approaching tipping point, as the complex context-project interaction makes predictions treacherous, giving room to political wishful thinking (see Flyvbjerg, 2014 for a note). The most we can do is anticipate various pathways, and learn from previously taken pathways – which is the value of *ex post* analyses.

2.2 Literature review of case studies

The effects and impacts of infrastructure and the presence of traffic are frequently assessed, but these tend to assume the community is a static entity simply undergoing impacts. Rarely a holistic view is taken that includes the accessibility value and effects for a community as a whole (Van Wee & Annema, 2009; Hamersma et al., 2017). The following discussion of literature lists the spatial effects of several road projects in somewhat comparable situations as the Faroese tunnels.

In Norway, some recent road and rail projects have been compared and analysed for labour market accessibility, service areas and competition, and commuting (Engebretsen & Gjerdåker, 2010; Lian & Rønnevik, 2010). One is between Florø, an industry-specialised port, and Førde, one of Western Norway's regional centres. The road improvement led to a merger of two labour and housing markets, increased commuting in both directions (+40%), centralisation of services in Florø, and population growth in Florø. Førde saw slight out-migration, but this merely relates to temporal economic cycles rather than the new road, which enables one to live without working there. Florø lost shops and services as customers now draw on Førde, which because of this expanded clientele started to attract big chains.

Another case study concerns the *Trekantsambandet*, a tunnel with three entrances connecting three fjord areas in Western Norway. It led to an integration of disjoint labour markets (supported by increased commuting), but not of service areas (Engebretsen & Gjerdåker, 2010; Lian & Rønnevik, 2010). The two small communities' retail sectors which suddenly faced competition from Haugesund proved resilient; locals keep buying locally. The authors do expect negative changes for the smaller communities in the future though. Another piece of research shows that not the removal of travel time (after opening), but the removal of toll (after break-even) deliver significant effects (Gutiérrez et al., 2016).

Meijer et al. (2012) shows how a tunnel under an estuary in Zeeland, the Netherlands redraw the core-periphery structure of the southern coast. It tied this southern area much closer to the central northern area, leading to centralisation forces towards the tunnel entrance and peripheralization near the two former ferry ports, which lay 15 kilometres east and west from the tunnel. The authors conclude that the tunnel may have given way to long-pressing developments – such as concentration of people and services; scaling up of institutions – that were previously held back by poor accessibility. Thus, the infrastructure itself did not generate these universal trends, but simply opened a door.

In Denmark, in 1997-1998, the Great Belt fixed link replaced the ferry crossing between the two most important islands. This cut 1.5 hours of travel time and was found to generate 25% more trips between either side of the Great Belt (Odgaard et al., 2014). Despite too optimistic expectations beforehand (Knowles & Matthiessen, 2009), the road-rail bridge-tunnel combination is found to have strengthened Denmark's economy and the nation; the latter represents a symbolic value perhaps much bigger than the project's monetary value. Also in Denmark, the Oresund Bridge opened in 2000 between Copenhagen and Malmö (Sweden). Contrary to expectations, a merger of two functional areas failed to occur. Cross-Oresund traffic four-folded (passengers) and 16-folded

(vehicles), but the international strait also represents a legal, fiscal, monetary, cultural and linguistic boundary that decelerates integration (Knowles & Matthiessen, 2009). There is therefore no common labour market; cross-Oresund commutes represent a fraction of domestic commutes (Grunfelder et al., 2016).

Bjarnason (2014) found that commuting between two previously poorly connected sides of a mountain in Iceland doubled after the opening of new road tunnels. This allowed an amalgamation of two municipalities. The tunnels led to a decentralisation of work within this municipality, but longer-distance commuting to the regional centre Akureyri (75 km away) hardly increased. Akureyri’s ‘micropolitan area’ did not expand. Also in Iceland, Karlsson (2011) researched how house prices correlate with transport improvements, finding that a decrease of 1 kilometre from the CBD (Reykjavík) meant a 0.46% fall of housing prices, up to a distance of 120 kilometres.

Lastly, from a cultural geographic perspective, Baldacchino (2007) deconstructs the concepts of bridges, islands and mainlands. He used the case of Prince Edward Island which was connected to the Canadian mainland by the Confederation Bridge in 1997. Locals feared an influx of tourists and holiday home owners, an exodus of islanders, increased competition (including box store chains), unemployment and ecological damage. In the very essence, they feared the loss of their ‘ownership’ and island identity. Baldacchino argues that many of the fears have not become true, or could not be traced back to the bridge. The PEI has retained its island status – where the toll boat still prevent a seamless transition – and the bridge has even become a symbol and landmark for the island. The dialectic relationship between mainlands and islands has not forged a mainland of the island, but found a synergy and redefined the definition of *islandness*.

In summary, none of the mentioned articles focus specifically on social impacts, but each identified process entails social questions. Each shows the Transport-People-Land-use interaction model at work; increased accessibility and connectivity (Transport) changes the spatial structure, which affects the people who live there. Vice versa, the fact that the resource of accessibility potential is used also implies that more mobility is meaningful to them, for example for financial benefits. One must remind oneself that the same individual can be both negatively and positively impacted at the same time in this self-structuring model.

2.3 Conceptual framework

Figure 3 depicts the research’s conceptual model, modified from Geurs et al.’s (2009, p.74) with a clearer distinction between effects and impacts. Straight lines indicate direct effects from transport and dotted lines indirect effects. Both may lead to social impacts, but an interaction of the Transport-People-Land-use system may prevent this. However, if social impacts are generated, they themselves cause

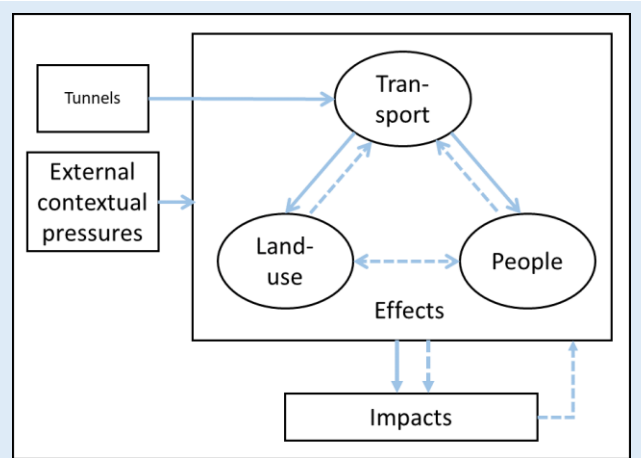


FIGURE 3. CONCEPTUAL MODEL

indirect effects that require the system to adapt. If this system is not adaptive or resilient, effects and impacts may turn into cumulative impacts.

The system is not static; contextual changes continuously interact with the system. They are included in two ways: long-running, existing trends in the country are integral parts of the system, while sudden pressures, such as global economic recessions or fishing crashes, are external to the model. External (exogenous) pressures are shown separately, while internal (endogenous) developments cannot be isolated from the parts.

One could also argue that the link Tunnel-Transport is bidirectional, as ultimately the desire to be more mobile gave rise to the tunnel projects. Like many mega projects, the tunnels are products of a complex interplay of societal debates and political interests (e.g. Flyvbjerg, 2014). To streamline the research, for now the point of departure is that the two tunnels exist without asking why.

3. Methodology and Analysis

This chapter is divided in two parts. Section 3.1 discusses why a qualitative case study methodology was chosen. The second section takes a closer look at the operationalisation of the applied methods.

3.1 Choices behind the research

Why a qualitative approach?

The main argument for a qualitative approach is that it delivers the most effective path to answering the research question. A main objective is mapping the effects and impacts, which are unknown at the moment, with few indications of their range. Without a range, it is hard to assess impacts' number and extent. The open, holistic character of this research benefits from qualitative methods' capacity to respond to the data during its collection (Dunn, 2005; Gill et al., 2008). Especially in a complex setting where multiple known and unknown developments co-occur, flexibility is key. Moreover, impacts are very much matter of perception – how people experience and imagine a phenomenon (Vanclay, 2012). Interactive methods such as interviews give the researcher the capacity to let the research object – the interviewees, as representatives of the communities they belong to – both assess, clarify and interpret phenomena simultaneously (Gill et al., 2008; Dunn, 2005). Meanwhile, the researcher can learn from the thought processes and the interviewees' behaviour, and respond to these.

Quantitative methods have the benefit of comparing cases 'objectively', provided that the data quality, number of cases and definitions are sound and wise. In addition, there should be other research available that allows for interpretation of the statistics in a context-sensitive way. However, neither relevant statistics nor benchmark literature to defend the accuracy of assumptions, data and results (i.e. triangulation) are available. Moreover, statistics need to be interpreted in a context-specific light in order to give meaning to numbers. For example, a 244% increase in commuting may seem impactful on paper, but *is* it in the eyes of the communities in question? Without these requirements ticked, a quantitative methodology must either focus on small details, or produces weak results.

The interest in the range of changes and how they matter to the communities is accommodated in a case study. Two cases – two tunnels and communities – that are relatively comparable but seem to have had different outcomes offer a way to study to the role of contextual factors in social impacts (see Flyvbjerg, 2010). Quantitative analyses may nuance interviews and observations. As description and argumentation are necessary to give insight in both the study object and methodology, case studies deliver relatively long texts (Flyvbjerg, 2010). Given context's all-importance, I will not conclude universal truths but rather potential mechanisms and lessons.

An interview-based methodology is also planning-wise more effective. Fieldwork had a limited timeframe (five weeks, May-June 2017) which should not run the risk of being unable to respond to flawed assumptions. I used the months before (November 2016-May 2017) to prepare self-standing, quantitative analyses that could be validated by the

various qualitative methods (Gill et al., 2008). The quantitative analyses and visualisations proved good to form hypotheses and interview questions. Besides interviews, fieldwork consisted of many informal conversations, library visits, and many travels and activities throughout the country.

Why the Faroe Islands?

The choice for the Faroe Islands rests on several factors. As mentioned, the researcher in point has a long and deep-running affection to the country, though non-personal motives play a role as well. Firstly, the country has a standing history of infrastructure projects, and with two sub-sea tunnels and (at least) two more to come, it is a relevant environment to study interactions between infrastructure and society. The fact that two tunnels were and two more will be built offers an opportunity for comparison and gain insight in the role of local context. Lastly, as an isolated micronation, the country approaches a ‘closed system’ which – hypothetically – makes correlations clearer. Lacking international road connections, all traffic growth must come from within. This does not mean an absence of external pressures and complexity, though these assumedly are better visible.

This research could choose between an *ex ante* and *ex post* approach, given that there are two existing and two upcoming sub-sea tunnel projects. However, the methodological challenges of *ex ante* assessments, the dire need for *ex post* assessments and the academic character of this SIA justify a retrospect approach. Moreover, while the two existing tunnel communities are in fairly comparable situations (Chapter 5), the upcoming projects differ radically from each other (Appendix II), which could be fruitful for *ex post* case studies (Flyvbjerg, 2010), but not at the *ex ante* stage.

Social impact assessment?

This research is a fusion of a SIA methodology and an academic research interest. It uses the community-based and context-sensitive qualities of SIA to identify processes, but rather than doing this with the intention of modifying systems (to improve quality of life), I primarily want to understand them. The researcher’s main goal is a personal and academic one (graduation, learning). An uninvited (but welcomed) outsider, I did not come to respond to cries from the local community for help. Given the object of understanding and my background, this SIA will specifically focus on social impacts reflected in spatial patterns (i.e. functions and behaviour). Also the long-term retrospect is atypical of SIA. It should be emphasised therefore that this is no conventional SIA *by design*.

3.2 Operationalisation

Previous paragraphs discussed the choices *behind* the research; this paragraph elaborates on choices made *in* the research process. The application of methods and a short review of the process are given.

Interviews

The main data source is semi-structured interviews; four held on Vágur and four in Klaksvík. One interview was with a group of three individuals, and two interviews with a duo. There was always one ‘lead’ person present throughout the interview, while the other/s would leave or – in the case of the café interview – was temporarily lost in the

universe of the smartphone. This gave a dynamic character to the interviews. Semi-structured means a list of prepared questions was present, but that there was flexibility to skip questions, address other topics and thus get a better insight in what mattered to the interviewee. Questions were mainly open-ended ('Could you describe how Vágur changed since the tunnel came?'), and few yes/no questions. They were based on Geurs et al.'s five themes of impacts, on other case studies, on processes occurring elsewhere in Faroe, on quantitative analyses and my own observations. Interviews were not recorded, so a pre-set list of codes was used during the sessions, during which I would quickly write down keywords. After the interviews, I restructured the interview on paper. In one occasion, I emailed questions beforehand.

The lack of recordings was a personal decision. The first interviews in Miðvágur were of informal character and I was afraid that a recorder, including the required informed consent protocols, would negatively affect the open character. Moreover, interviews make me highly nervous and a recording device would not merit the 'sharpness' of the interviewer. In my opinion it was better to have a good, unrecorded interview than a fully documented but suboptimal interview. In one occasion, an interviewee shared politically sensitive opinions that s/he would probably not have shared while recorded. One interview was based on questions that I had emailed beforehand. I analysed the interviews like recorded interviews by coding and summarising my own reconstructed 'transcripts'. From the lack of recordings follows a lack of direct quotes, thus more paraphrasing.

Focus groups as a method have also been considered, but these were too difficult to arrange and the researcher was too unexperienced and shorthanded to produce meaningful discussions. In addition, my Danish is of a lower level than the interviewees'; resulting in the risk of losing track of vital information.

Literature

Academic and grey literature about the Faroe Islands, both in English and Faroese, is used to provide context to interpret empirics. Everyday mobility and especially commuting have been addressed in several publications (Holm, 2004; Finnson & Kristiansen, 2006; Kristiansen, 2006; Hovgaard & Kristiansen, 2008). An important source for changes in Vágur's society is the book *Vága Samferðslusøga* ('Vágur's Traffic and Communication History') by Petersen and Poulsen (2013). They list short interviews with representatives of Vágur's public and private sector, touching upon a variety of changes. Some of the information in these interviews is used as data for this research, but unless explicitly cited, the word *interview* always refers to my own empirical interviews.

Other books include local atlases and journals, village history accounts, plans and reports. Many of these could only be accessed in local libraries, which is where the researcher spent considerable amounts of time.

Commuting statistics

Commuting gives an insight in the spatial structure of a country. Of the two datasets available, one gives a highly detailed background picture for 2011 (Hagstova, 2011), while the other gives a rough look at how commuting developed between 2005 and 2010.

Since neither of these were examined closely in other research, I used this thesis as an opportunity to do so.

The 2011 census included questions on the place of residence and the normal place of work or education. This gives an insight in how all adults (15 years and over) commute. The dataset was first analysed in ArcGIS and visualisations were made in vector drawing program Inkscape. Several issues had to be solved in the analysis. I brought down the number of settlements by designing special clusters of villages. Flows smaller than three are not shown in the dataset, which corresponds to circa 6% of the flows. This impacts the data quality of clusters with many small villages, as these often only send one or two people to each neighbouring settlement, hence zero according to the data.

The transport plan gives an insight in how commuting has responded to the sub-sea tunnels. In contrast to the census, it does weigh for frequency; for instance a person who works in Tórshavn three days a week and at home once a week is counted as $\frac{3}{5}$ Tórshavn-commuter and $\frac{2}{5}$ non-commuter. The data quality, however, could not be assessed since a reproduction of the original was used. Because of this, and because education trips were not included, the two datasets cannot be 1:1 compared.

Population distribution and domestic migration

Migration statistics from the Faroese statistical office were analysed in ArcGIS after claims that the tunnels increased the population of the case communities. Special clusters were designed for meaningful analysis. Visualisations (in Inkscape) include maps and circular graphs (Appendix III). No statistical tests were performed.

Traffic numbers

Traffic increase is the underlying hypothesis of all other expected effects and impacts. To check if traffic did increase, statistics from various sources were brought together (Appendix I and III). Unfortunately a major gap in the data remains ferry traffic for the pre-tunnel years.

Other quantitative analyses

Despite its various datasets and high quality, Faroe Statistics (Hagstova) could not deliver many indicators of social cumulative effects (e.g. Mitchell & Parkins, 2011) and land-use change. Data is either not available at all, not on the regional or local level, or only for one census year. Producing my own indicators based on less relevant statistics was beyond the scope of research. Statistics that I would have loved to assess are, for example, disposable income and wealth, retail, level of education, and housing prices and ages. Therefore, all other statistics applied are ‘dummy’ comparisons between past and present, or they sketch a general background picture.

Online news media

The half-year before and the time during the research, I have closely followed the Faroese domestic news online. This way I kept track of current spatial developments, ranging from residential expansions in Tórshavn and Vágur to new plantations, access roads and harbour quays. Moreover, I conducted Google queries to get my hands on relevant news from older articles, radio and television items. All these form a ‘bonus’ layer to the research, offerings facts and insights from various angles.

Sketching

During the stay I also experimented with sketching and visual note-taking, inspired by artist Rothuizen's *Zachte Atlas van Nederland* ('Soft Atlas of the Netherlands', 2011). He combines observations of Dutch cultural spaces – market squares, hospital rooms, IKEA show rooms, neighbourhoods – to capture vernacular practices, combined with fun facts, questions to readers, and events that happened during his visit. It turned out more difficult than expected, especially for an outsider who wants to do more than to gather juicy touristy facts. Some sketches were made during the write-up of conclusions to trigger new, (self-) critical questions.

Participative observation

Fieldwork was in May and early June 2017, before the height of the holiday season. Although I took advantage of my stay to visit some highlights I hadn't visited before, I also spent considerable time on non-tourist activities, where I had informal conversations with Faroese citizens and experienced daily life as it is. I attended the centennial of the public transport agency, went to libraries, visited football matches, met a professor and had countless of walks in the communities. Moreover, I cooked my own meals mostly, for which I quickly learned which supermarkets were best for which products. To have daily routines, 'commutes' and activities helped me get a sense of everyday life. Especially Vágur, where I lived two weeks with a family, gave an insight in community life. I kept track of my observations in a diary and through photography.

3.3 Positionality

This thesis follows a holiday (2012) and six years of submersion into the country. I learned about both the geographic and governance side of, for example, infrastructure planning, environmental policy, housing development and fisheries. For assignments during education and as a pastime, I designed countless maps and plans for the country. Following the news and learning the Faroese language (to limited avail) have ultimately provided me with a deeper-than-average, intuitive sense for local spatial context. Regarding the Faroese geography, I took a fluid position on the outsider-insider spectrum, but in a wider cultural perspective, I remained an absolute outsider.

This positionality was confirmed time and again. Interviewees were surprised with my pre-existing knowledge of very specific context, to the extent that they found it odd – which sustained research progress. However, I lacked understanding of basic cultural things, such as norms, habits and language. On the street and in company, I was usually addressed in English for I was considered a tourist even when I was introduced by someone else. My Danish proficiency – *without being an 'import' Dane* – raised 'forgiveness' for my rusty Faroese. Interviewees were often intrigued by my interest in the country and would often ask about my life path and opinion on Faroese matters, which supported our mutual trust relationship. My fields' (and Dutch) way of thinking – planning ahead – sometimes resulted in misunderstandings.

4. The Baseline: a spatial profile of the Faroe Islands

In order to discern a potential tunnel effect, the context of co-occurring developments need be identified, as it is likely that most effects and impacts result from an interplay of elements. This chapter attempts to sketch an answer to the question: How does the Faroese spatial context look like anno 2017? In particular the country's relationship with its capital and everyday mobility are matter of discussion.

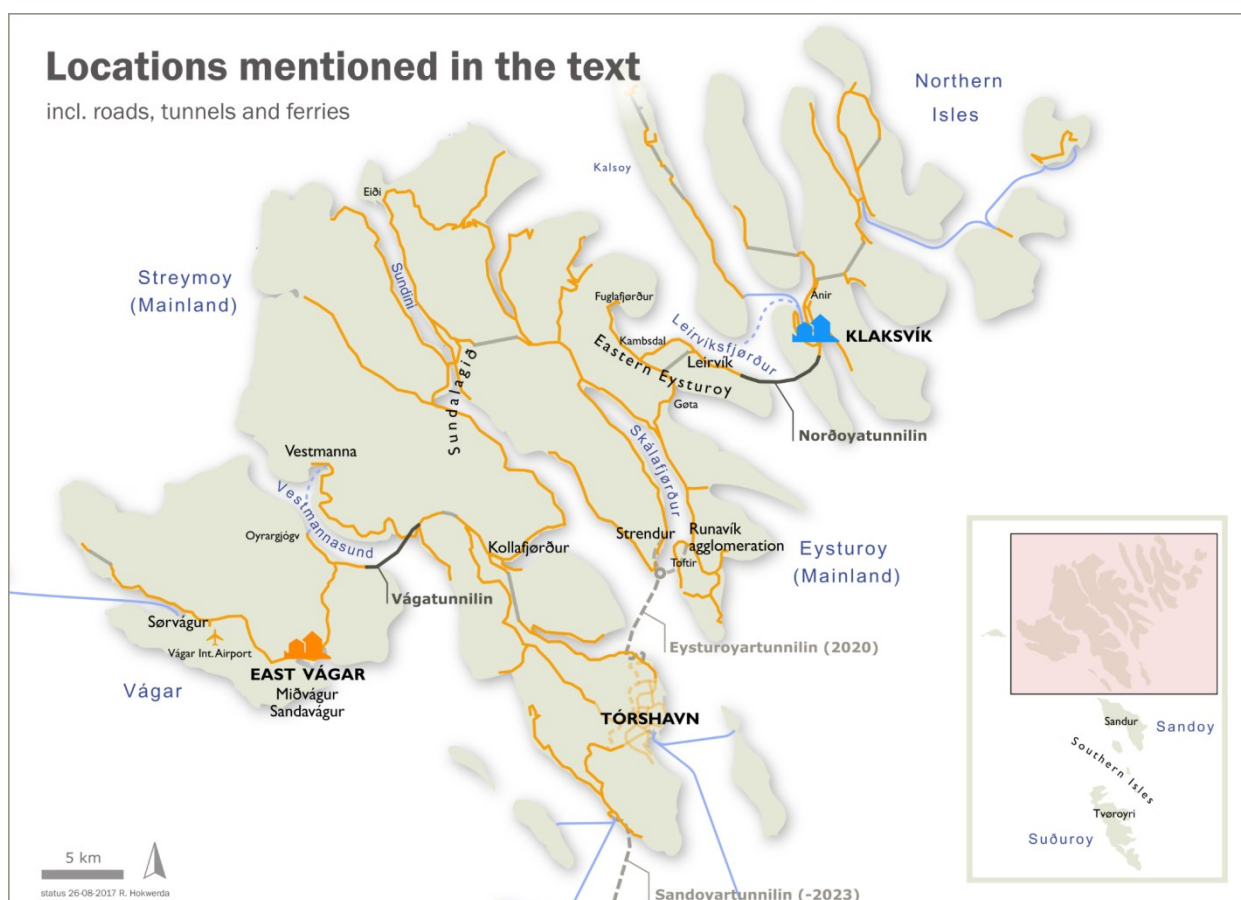


FIGURE 5. MAP MARKING THE MAIN LOCATIONS THAT ARE MENTIONED IN THE UPCOMING CHAPTERS. A POPULATION MAP WITH ALL SETTLEMENTS IS FOUND IN APPENDIX III. COURTESY OF THE AUTHOR.

Introduction

The Faroe Islands are situated in the North Atlantic Ocean in between Iceland, Shetland (Scotland) and Norway. The country can be considered a micronation, with a population of 49,884 (2017) and a surface area of 1399 km² (circa half of Luxembourg) (Hagstova, 2017a,b). It consists of 17 inhabited islands, some deeply incised by fjords and all surrounded by large sections of cliffsides. Capital Tórshavn is the nation's undisputable

centre point, holding circa 19,000 inhabitants (37% of the total) and serving as the commercial, administrative, educational, religious and cultural capital (Guttesen, 1996). Like Greenland, the Faroe Islands form a self-governing nation within the Danish Realm. Via foreign politics, import and export, financial flows, transport networks, education and family ties, Denmark remains an important partner.

Economic-geographic overview

The economy is highly specialised in fisheries, fish products and fishing technology. Circa 96% of the export consists of fish products (Hagstova, 2017e) and approximately 15% of the workforce is employed in the sector (Hagstova, 2017f,i). The public sector (at 36% in 2016) is growing steadily nation-wide while fisheries are losing in the share of employees. Offshore fisheries and plants are concentrated in towns such as Klaksvík, Fuglafjørður and Tvøroyri, which thank their status to the country's transition from agriculture to fisheries in the 19th century (Numminen, 2010).

Triggered by a modest fishing crash and a financially ill-structured banking system, a deep financial recession stroke the country in the early 1990s, which caused an equally deep socio-economic and demographic crisis. Nearly half of all fishing processing plants closed (Arge, 1997), unemployment rose to 19% and around 10% of the total population emigrated between 1990-1995 (Hamilton et al, 2004). The crisis was overcome through Danish financial aid and restructurations of the Faroese financial and economic policy at all layers of society (see Hovgaard, 2002; Apostle et al., 2002).

The crisis marks the end of the industrial, modernist era or 'Faroese Fordism' (Apostle et al., 2002; Gaini, 2011) and precluded an economic transition from production to knowledge-based activities. Diversification in- and outside the fishing sector must harness the country against new crashes and crises. This includes tourism, oil exploration (see Bertelsen et al., 2015), ICT, innovation in the existing private sectors, and renewed interest in aquaculture. The braindrain to other Nordic countries is an persistent barrier to the transition's progress (OECD, 2011).

Between 2006-2010, the country was hit by a financial recession that affected mainly industrial sectors, leading to a temporary peaks in unemployment (Hagstova, 2017f), stabilising housing prices and a halt in traffic development (appendices: Figure 16 **Error! eference source not found.**, Figure 27). After this bust, the country now experiences an economic boom (Danmarks Nationalbank, 2016).

Demographic overview

The Faroese population lives concentrated in a few towns and circa hundred villages. Around 37% of the population concentrates in the capital Tórshavn and a further 49% lives within one hour by car (Hagstova, 2017a; GoogleMaps, 2017). Other major towns include Klaksvík, the Runavík agglomeration, Mið- and Sandavágur, and Tvøroyri.

After the 1990s crisis, the demography is characterised by slow population growth, (sub)urbanisation in the central areas and an ageing periphery, and high emi- and immigration rates¹ (Hagstova, 2017a; Grunfelder et al., 2016; OECD, 2011). The

¹ The words emigration and immigration refer to migration to/from abroad, while the words out-migration and in-migration refer to domestic moves.

population rose by 3.3% in the past ten years, crossing the ‘magic’ 50,000 mark in spring 2017 (Hagstova, 2017a). Total population growth is clustered in select urban and suburbanisation zones. Mainly Tórshavn, Vágur and the Skálafjørður have seen above-average population growth since the crisis, while other central areas do grow in absolute numbers but stay behind as compared to the national average (Figures 20-24). The periphery, encompassing the Southern Isles Sandoy and Suðuroy, small outposts and the northernmost parts of the Mainland, shows a downward-sloping trend which was reinforced by the 1990s crashes and only recently shows stabilisation (e.g. Holm & Mortensen, 2007).

Faroese society is highly mobile internationally and domestic migration is outnumbered by migration abroad (Hagstova, 2016a; OECD, 2011). Remigration – emigrants returning to Faroe – is a fairly recent phenomenon (Hagstova, 2017a) and shows no spatial preference; both periphery and semi-periphery receive more immigrants than they send emigrants. One exception is Tórshavn, which has an emigration surplus, but this is fully compensated by local in-migration. The periphery is still characterised by ageing and a male surplus, while the centre areas are relatively young and gender-balanced (Grunfelder et al., 2016).

Housing and mobility

The Faroese spatial landscape is characterised by processes of urbanisation and suburbanisation. Tórshavn is a popular place to settle having access to an exceptionally high service level (for a town of its size), a concentration of non-industrial, non-fishery jobs and a distinct (‘Danish’) culture and atmosphere. It houses many company headquarters, flagship stores and governmental agencies, several secondary schools and higher educations, cultural institutions, and sports venues.

The sheer demand for housing in Tórshavn and the restricted supply have resulted in housing prices that average 2-3 times those of villages. Property costs on average DKK 2,500,000 (à €336,000) in 2016 (Hagstova, 2017h). To meet the demand, the city has constantly expanded during past decades and upcoming years, but to limited avail (Guttesen, 1996; Tórshavn Kommuna, 2007, 2014; Samuelsen, 2017). While some choose to adapt by living in cramped quarters, such as garages or at the parents’, the crowdedness produces a suburbanisation flow among starters and low-income families who are pushed away to the villages (Hovgaard & Kristiansen, 2008; Vang, 2016). The housing shortage is certainly not solved by an absence of social housing and a culture of spacious, detached private-owned houses that results in a suburban, sprawled landscape (although exceptions apply; see Pezzeri, 2017).

Nevertheless, as Hovgaard and Kristiansen (2008) argue, for many living in villages is first and foremost a socially motivated decision, as villages offer a platform for the lifestyle and values associated with the ‘countryside’ (also see Kristiansen, 2006; Gaini, 2011). Mobility is the motor behind a regional form of dwelling: one works, sports, shops and sleeps in multiple places and connects these by car. This has given rise to a Faroese post-modern ‘network society’ (Hovgaard & Kristiansen, 2008). Especially on the well-connected Mainland, series of villages have ‘specialised’ as dormitory villages while select towns have attracted the lion’s share of jobs and services (Holm, 2004; Kristiansen, 2006).

The car is a pivotal tool to meet daily life needs, though the car’s significance runs deeper. Being mobile has become the new faultline of Faroese ‘rural’ – that is, suburban – society (Kristiansen, 2006). Moreover, for many young men, fixing and driving cars is a popular pastime and a source of masculine identity (Gaini, 2011). Being immobile means one cannot take part in modern village life, which ultimately could feed social exclusion and injustice (see Jákupsdóttir, 2014). The extent of this (potential) problem and whether or not this produces an extra urbanisation pressure is not known.

Commuting statistics

To visualise commuting and identify regional networks, I analysed the 2011 census (Figure 23-Figure 24). Tórshavn is the principal “magnet” (Hagstova, 2015) for commuters, attracting in total 2,700 commuters from nearly every cluster, while sending only 450 persons. This makes the country effectively one large functional region revolving around the capital, though distinct regional sub-networks occur. The Northern Isles hinge on Klaksvík for work and services, while Klaksvík is also part of the polycentric Eastern Eysturoy-Skálafjørður region. Suðuroy has a strong island-wide network, though Vágur, Sandoy and the Sundalagið show much weaker regional networks and are overshadowed by commuting to Tórshavn.

Unfortunately this census reports the situation of a single year and hence cannot be used to interpret developments over time. The 2010 traffic plan, however, does list statistics of commuting between regions for 2005 and 2010 (Rambøll, in Landsverk, 2012). Between these years, commuting increased with 25%, a growth that is particularly visible to and from Eysturoy and Klaksvík. Tórshavn received circa two-thirds of all commuters, underlining once again its gravity. Other regional magnets of commuters are Runavík, Tvøroyri, Kambsdalur, Fuglafjørður and Sørvágur. The first two are regional centres with diversified economies, while Kambsdalur specialises in education, Fuglafjørður in fisheries and Sørvágur in aviation logistics.

Infrastructure

The Faroese road network consists of one large network (the Mainland plus Vágur and three Northern Isles) and several island networks that are accessible from the Mainland by ferry

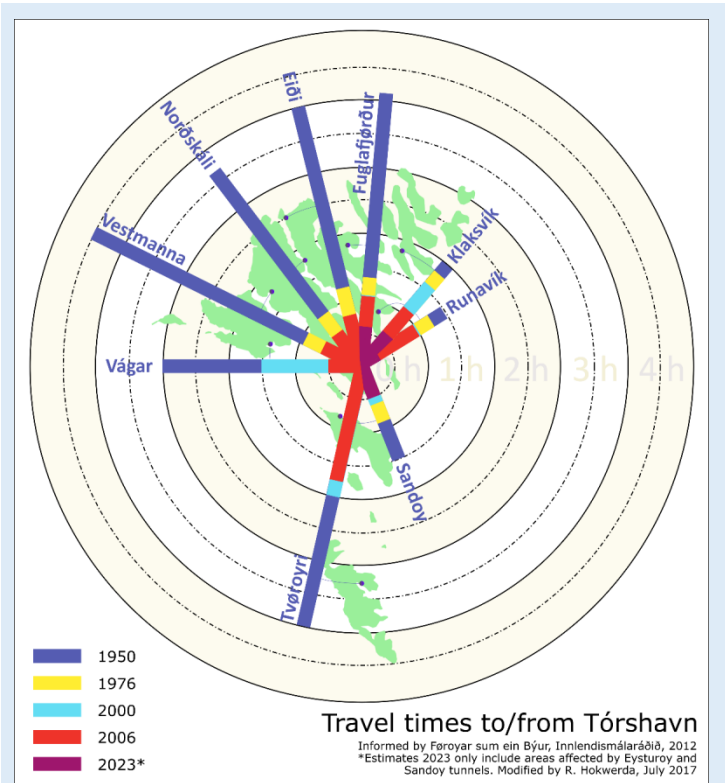


FIGURE 6. TRAVEL TIMES TO/FROM TÓRSHAVN IN SELECT YEARS. VESTMANNA SAW TRAVEL TIMES DROP FROM 4.5 TO ¾ HOURS BETWEEN 1950 AND 2000 AS THE RESULT OF THE DEMISE OF FERRIES AND THE RISE OF ROADS. INFORMED BY INNLENDISMÁLARÁÐIÐ, 2012.

(figure 19 Appendix III). Tórshavn lies somewhat excentric in the network; the busiest highway runs from Tórshavn north to Kollafjørður, where it branches off west to Vágur and east to Eysturoy and Klaksvík (Landsverk, 2012).

Figure 25 (Appendix III) shows how the road network developed since the 1950s, which gave rise to significant time-space compression (figure 6). The 1980s and 1990s saw the introduction of infrastructure *replacements*, replacing troublesome mountain roads by tunnels and changing long ferry routes to short shuttles. Where short shuttles already existed – to Vágur and Klaksvík – calls for submerged tunnels arose (Gaini & Jacobsen, 2008).

The transport plan strives for further travel time reductions, so that each ‘ferry-less’ village comes within one hour from Tórshavn (Landsverk, 2012). The plan is named ‘Faroe as one City’, framing Tórshavn as downtown and the villages as suburbs of this North Atlantic city. Future projects include submerged tunnels from Tórshavn to Eysturoy and Sandoy (Appendix II), which will centralise Tórshavn’s position in the road network.

Summary

The country is in a transition from a modern to a post-modern society (Hovgaard & Kristiansen, 2008), currently experiencing economic and population growth in mainly the central areas. Tórshavn is the country’s undisputable centre (or CBD), offering high-end services, public sector jobs and transport links, but meanwhile the capital is equally dependent on the villages or ‘suburbs’ for clientele, employees and for the economy to work as a whole. Everyday mobility, facilitated by high-quality infrastructure, policy measures, financial benefits and cultural norms, is an important constituent of contemporary Faroese society. Commuting statistics gave an idea of the country’s regional landscape, which slowly dissolved since the 1970s from many small to few big regions.

5. Case communities: Vágur and Klaksvík

Elementary Faroese

-fjørður, -sund	strait, sound, fjord. Either single-ended or open on both sides.
-tunnil(in)	(the) tunnel.
Vágafólk	inhabitants of Vágur.
Klaksvíkingar	inhabitants of Klaksvík.
Havn(in)	colloquial name for Tórshavn, i.e. the Harbour.

This chapter introduces the case study areas and the tunnels in question. Where are they situated and why are they significant? How did they relieve travel constraints?

5.1 The tunnels' history

During the 1980s and 1990s, the Vestmannasund and Leirvíksfjørður sounds carried the country's two most travelled ferry routes, from the central islands of Streymoy and Eysturoy to the more outward Vágur and Northern Isles. These interregional links were perceived as 'gaps'; hindrances to a unified country (Dalbø & Høgnesen, 1997; Vinnumálastýrið, 1999; Gaini & Jacobsen, 2008). Moreover, with the recent past's many road projects and an unofficial pro-periphery policy (Hovgaard & Kristiansen, 2008), the tunnels also were objects of regional equity – this time, it was Vágur's and Klaksvík's turn. The tunnels are primary entries in the 1999 Transport Plan that includes multiple routing and financing scenarios (Vinnumálastýrið, 1999).

Geological soundings were carried out in the late 1980s in response to successes in other Nordic countries. The Vágatunnilin was started with in 1989, but halted instantly due to political turmoil; a prelude of the crisis that was to delay the plans a decade (Gaini & Jacobsen, 2008). Parliament reapproved the project in 2000 (Act on Vágatunnilin, 2000) and its expected success gave political mandate to construct the Norðoyatunnilin (Act on *ibid*, 2002). Both tunnels were inaugurated with festivities, as true national milestones (Petersen & Poulsen, 2013; Fjallstein, 2011).

Neither project had been subject to SIA, nor were a transition management plan or central vision set-up by the government. Environmental Impact Assessments and Cost-benefit analyses were not found during my research.

5.2 The communities

Vágur and the Vágatunnilin

Vágur island has three big towns; Sørvágur, Miðvágur and Sandavágur, each with circa 1,000 inhabitants. The island has seen a long, gradual decline of the fishing industry, for which the 1990s crisis was a tipping point (Dalbø & Høgnesen, 1997; Hovgaard, 2002; Apostle et al., 2002; interviews). In Sørvágur fishing recovered to some extent, while in the other two towns only saw the introduction of aquaculture. The island has moved to a production and service-based economy, where especially the country's airport forms a sizeable employer (Dalbø & Høgnesen, 1997; Hovgaard, 2002). Figure 8 shows the



FIGURE 7. VIEW OVER MIÐVÁGUR, OVERLOOKING OVER THE BAY. SANDAVÁGUR SITS BEHIND A HILL IN THE CENTRE OF THE PICTURE. COURTESY OF THE AUTHOR.

employment structure as of 2016. Vágur houses some of the country's key tourist attractions and draws many tourists in summer.

Miðvágur (Figure 7) and Sandavágur, one of the case communities of this research, are part of the same municipality (Vága Kommuna, since 2009), share a school and a port, and form almost one continuous built-up area. For the ease of reading, I will refer to them as a single town (East Vágur) although officially they are two villages. The 'town' has 1,980 inhabitants and thus forms the country's fourth-largest settlement. Their two centres lie at either end of a biforked bay, circa 3 kilometres apart. Miðvágur is traversed by the national highway which, at school and airport peak hours, can cause minor congestion. In between the communities lie the elderly home, a small business estate and the primary school. Both communities have a football field, kindergarten and church, but the petrol station, two supermarkets, café, restaurant, cultural centre, marina and nautical services are situated in Miðvágur. Sandavágur retains a minimarket and some specialised shops (e.g. wedding dresses, Asian foods).

Vágur is separated from Streymoy by the narrow Vestmanna Sund that used to be crossed by ferries from Vestmanna. They crossed 15 times per day, providing space for 30-35 cars and taking 25 minutes per leg (Vinnuálastýrið, 1999). This travel time excludes queueing time (ca. 15 minutes), debarkation and delays. The route was plagued by lacking capacity (Dalbø & Høgnesen, 1997) and it was no exception to have to wait for a second or third departure if one wanted to bring a car or lorry.

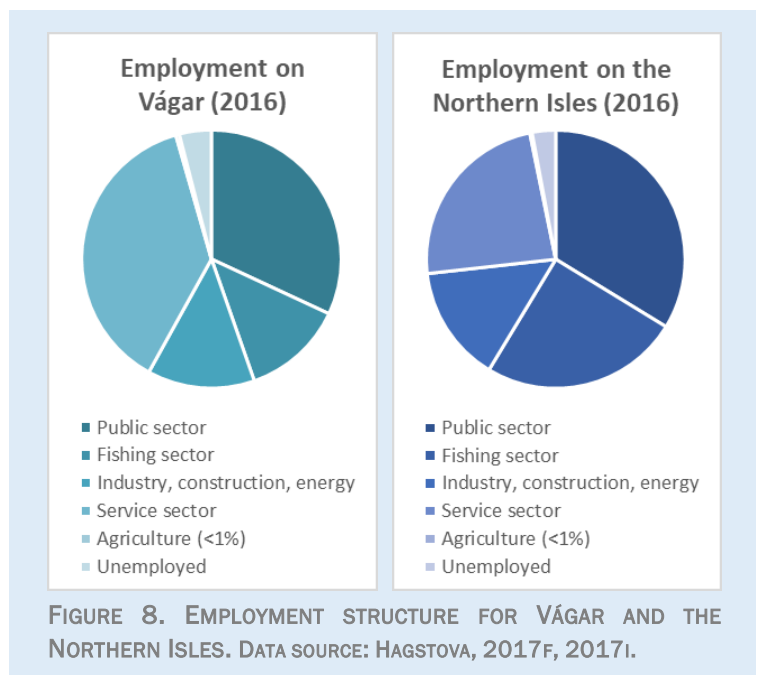


FIGURE 8. EMPLOYMENT STRUCTURE FOR VÁGUR AND THE NORTHERN ISLES. DATA SOURCE: HAGSTOVA, 2017F, 2017I.



FIGURE 9. KLAKS VíK AS SEEN FROM THE SOUTH. THE BAY THAT INCISES THE TOWN IS A DEFINING FEATURE OF THE URBAN LANDSCAPE, AS IS THE MOUNTAIN IN THE BACKGROUND. EYSTUROY LIES ON THE LEFT OF THIS PICTURE (SEE APPENDIX III FOR AN AERIAL VIEW). COURTESY OF THE AUTHOR.

In December 2002 the 4.6 kilometre Vágatunnilin opened between Central Streymoy and southeastern Vágur, which saved both the hassle of ferries and cut 12.8 kilometres in distance. It cuts at least 45 minutes of travel time, or up to 60 minutes if queuing and debarkation are included. The tunnel cost DKK 280 million (à € 38 million), of which 55% was paid by the government and 45% by user fees (toll) (Tunnil, 2017; Petersen & Poulsen, 2013). The investment broke even in February 2017 and caused an intensification of the debate whether tunnel tolls should continue to be levied (Abrahamsen, 2017; Landsverk, 2017).

In the census, 134 people reported to commute to the island of Vágur and 428 away from Vágur (Hagstova, 2011). Two-thirds of the out-commuters from Mið- and Sandavágur commute to Tórshavn and nearly one-third to Sørvágur. As a destination, half of the 125 in-commuters come from Sørvágur. Mið- and Sandavágur are thus mainly out-commuting communities. Traffic on the highway between the town's two centres averaged up to 3,000 vehicles per day in 2012 (Landsverk, 2012).

Klaksvík and Norðoyatunnilin

At 4,719 inhabitants (2017), Klaksvík is the second-most populous city of the country and is considered the national fishing capital. It is an important regional centre for the Northern Isles and for Eysturoy, offering the country's second-largest concentration of retail (IPC, 2011). Its port is a trawling hub, as well as a minor container and ferry port. Figure 8 shows the employment structure for the region at large (Hagstova, 2017f,i). The city organises an international fishing industry gathering (Atlantic Fair) every odd year.

Klaksvík's geography is confined by two steep mountain ridges and an inlet that almost separates them (Figure 9). A narrow, flat isthmus connects the two ridges and forms the natural centre between the two parts of town. It houses offices, public institutions and sports venues, but a real city centre is lacking. The inlet houses quays, shops, industry, parkings and some housing. In summer, the town is the gateway for tourists to the Northern Isles, and during festivals it is an important destination itself.

Until 2006, ferries had sailed between Leirvík and Klaksvík across the Leirvíksfjørður (Figure 26) on average 15 trips per day, taking 25 minutes per leg. The ferries docked close to the towns' centres, which made bringing a car unnecessary for many occasions and reduced the capacity constraint. There also used to be a direct ferry between Tórshavn and Klaksvík, but this service ceased several years before 2006, when the

Norðoyatunnilin opened. This tunnel measures 6.2 kilometres and links Klaksvík to – again – Leirvík. Travel time savings are 20-25 minutes, or 45 minutes if queuing, spare ‘safety’ time and debarkation are included (Tunnil, 2017; Landsverk, 2012). The tunnel cost DKK 395 million (à € 53 million), one third of which is paid for through tolls (Tunnil, 2017; Klaksvík Municipality, 2014).

The 2011 census (Figure 24, Appendix III) shows that the Norðoyatunnilin is used for commuting in both directions, with 429 going east-west and 268 going west-east. Klaksvík forms part of a Eastern Eysturoy/Skálafjørður, the Northern Isles and Tórshavn functional region. Klaksvík receives 557 commuters, half of which from the Northern Isles. It ‘sends’ 417 commuters, of which 40% to Tórshavn and 34% to eastern Eysturoy.

Relevant to Klaksvík is the Eysturoyartunnilin, a tunnel between Eysturoy and Tórshavn that will open in 2020. It will form a shortcut for traffic from Klaksvík to the capital, bringing travel times from 60-65 down to 36 minutes (Kjølbro, 2014; EST, 2017a). Disregarding the toll effects, that means Klaksvík will be as close to Tórshavn as East Vágur is nowadays. Appendix II goes into more detail.

Comparison

Table 1 lists some key commonalities and differences between the two communities. The tunnels form milestones in a more and more saturated road network (Figure 25) and an integration of functional regions. Neither tunnel was devoid of public discussion and appeal (Petersen & Poulsen, 2013; Fjallstein, 2011), yet were a mere matter of time rather than will. Not only travel times, but also travel costs declined with the tunnels (Appendix I), but unlike travel times, they fell incrementally in response to increasing usership and community needs.

TABLE 1. SCHEMATIC SUMMARY OF THE TWO PROJECTS. FOR A COMPLETE OVERVIEW AND SOURCES, CONSULT APPENDIX I.

	Váгатunnilin	Norðoyatunnilin
Type of project	Centre to semi-periphery	Centre to semi-periphery
Saved travel time	45 (+15) minutes	20-25 (+15) minutes
Construction costs	€ 38 million	€ 53 million
	East Vágur	Klaksvík
Population (2017)	1,980	4,889
Region’s centre (2017)	Tórshavn, to a lesser extent Miðvágur	Klaksvík, to lesser extent Runavík and Tórshavn
Commuting (2011)	Predominantly out-commuting	Bidirectional commuting
Important destinations for people from other islands	Airport	Fishing factories, shops
Distance to Tórshavn (2017)	39 km, 37 minutes	74 km, 65 minutes
Upcoming national road projects with local relevance	None	Eysturoyartunnilin
(+15) INDICATES QUEUEING AND DEBARKATION TIME. NOTE: FAROESE HAS NO DIFFERENCE BETWEEN TOWN AND CITY.		

5.3 Hypotheses

The differences in travel time, costs and capacity between ferries and tunnels are obvious and suggest that less traffic refrains from interisland travel. Traffic numbers should therefore have increased. More connectivity is the driver of the societal effects and impacts should have occurred. This concerns both how the communities themselves alter their behaviour directly and how they are impacted by others' altered behaviour indirectly. Expected effects:

- Traffic nuisances, road safety concerns and a changed in-street atmosphere. The infrastructure itself is hidden and of no concern.
- Centralisation. The reduced distances enable companies to operate from a single location, causing jobs, shops and services to move to Tórshavn. In a book dedicated to the Faroese public works authority, Gaini and Jacobsen (2008, p.122) claim that “every time we get a transport improvement in this country, Tórshavn strengthens”, hence a weakening of the periphery could be expected.
- Suburbanisation. The other way around, tunnels enable Tórshavnians to visit Vágur and Klaksvík more easily. Given Tórshavn's housing market, I expect a decentralisation of residential services, i.e. increased settlement of people in Vágur and Klaksvík who commute to Tórshavn.
- Hence a dissolvment of functional boundaries. The removal of a defining piece of identity, a sea strait, puts island identities under pressure and makes imagined boundaries, such as urban-rural dialectics, more important.
- The communities are impacted in several ways. Daily life routines change, rhythms change and the atmosphere changes not to everyone's liking. 11 and 15 years after opening, the tunnels have left the communities with a deteriorated service level, for which automobility forms the mandatory adaptation. Without access to a vehicle, quality of life must have declined. Also the influx of newcomers may create frictions ('social stress').

Vágur and Klaksvík are quite different in character and in position relative to Tórshavn. Klaksvík is more than twice as large, twice as far from Tórshavn and the travel time cuts are half those of Vágur. I expect Klaksvík to have some autonomy that helps resist change, while Vágur is too small and proximate to Tórshavn to slow down impacts to their own pace. Klaksvík will however be situated as close to Tórshavn as Vágur is nowadays when the Eysturoyartunnilin opens, which will cause distress.

All in all, I expect positivism about the tunnels. In Anglophone publications – mostly tourist brochures – the tunnels are often praised as engineering marvels that brought the country together (e.g. Danielsen, in Petersen & Poulsen, 2013). As usual, tourist discourses like to emphasise things that appeal to outsiders rather than insiders, but in the essence I expect the tunnels to remain symbols of progress and unity. However, the ferries will be sources of nostalgia.

6. “It changed everything!” – Empirical results

This chapter answers the first objective of this research: identifying the changes and some of their underlying processes. Both tangible changes and less concrete, ‘soft’ changes occurred. The results are put in separate paragraphs for reasons of readability; it should be emphasised that the chosen order and labels are not strict, since the complex nature of societal change causes sheer overlaps between them.

Note – where references are absent, interviews and informal conversations are the source.

Traffic

Changes in traffic numbers are an indicator of social change, as the traffic is the embodiment of increased connectivity and relationships between islands. Traffic can also form impacts through noise and air pollution and road safety (Geurs et al., 2009; Hamersma, 2017). Figure 10 shows how vehicle numbers across the Vestmannaasund and Leirvíksfjørður have developed since 2000 and 2003. Unconstrained travel resulted in a ‘boom’ of traffic during the first years and a stabilisation afterwards during the 2006-2010 recession. Since 2011 numbers have shown exponential growth and are currently at a 7.5 and 9.5-fold increase since the termination of ferry services.

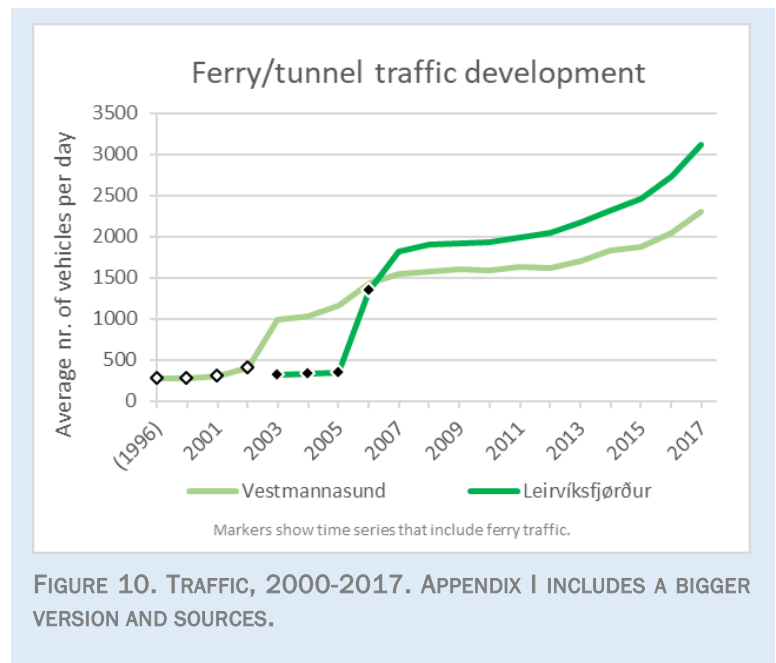


FIGURE 10. TRAFFIC, 2000-2017. APPENDIX I INCLUDES A BIGGER VERSION AND SOURCES.

Although this growth does not constitute solely a generation of new traffic, but also travel substitution, there are many reasons to believe that interisland connectivity greatly expanded (Appendix D).

Thus, significantly more traffic must have entered the communities’ streets. In Miðvágur, traffic increased from 2,154 in 2001 to 2,976 vehicles per day in 2012 (Landsverk, 2002-2012). Road safety has been a concern for East Vágar in the first years after the tunnel opened (partly relating to changes in the nightlife scene; see later paragraph) with many road fatalities, which form a major social impact, but road safety measures have helped (Vága Municipality, 2016a). A small annoyance is mild congestion at bottlenecks (á Rógvi, 2017b). In Klaksvík, traffic is no issue according to interviewees; nor are the luxurious amounts of parking space in the town heart perceived as detrimental to the spatial quality. Ubiquitous ‘Mind our children!’ and ‘slow down!’ signs indicate that road safety is a concern in almost every Faroese community.

Relevant to explaining the growth is the incremental reduction of tolls. Initially toll fees outpriced ferry tickets, but gradual reductions have brought tolls now below a financial threshold. People with a subscription (discount scheme) pay circa € 4 per return trip as of 2017; “too little to think about”, “you just go!”. Most Vágafólk, Klaksvíkingar and Eastern Eysturoyingar have a subscription. More on tolls in Appendix I.

Residence and migration

The interviews tried to gain more insight in how increased accessibility affected housing mobility decisions. Interviewees would often tell anecdotes of how they or a household in their social circle relocated into or out of the community because of the tunnels. Others wouldn’t have accepted jobs on the neighbouring island if it weren’t for improved accessibility. Quantitative analysis is used to give more insight in migration; interviewees gave meaning to the numbers.

TABLE 2. POPULATION DEVELOPMENTS SINCE THE TUNNELS OPENED. DETAILED POPULATION DEVELOPMENT MAPS ARE FOUND IN APPENDIX III. HAGSTOVA, 2017A.

	Jan 2002	Jan 2006	Jan 2017	% change since 2002	% change since 2006
East Vágar	1,648	1,809	1,980	+20.1%	+9.5%
Klaksvík	4,712	4,761	4,889	+3.8%	+2.7%
Tórshavn	16,727	17,398	19,036	+13.8%	+9.4%
Country total	46,945	48,125	49,884	+6.3%	+3.7%

Mið- and Sandavágur experienced strong population growth during the first decade after the tunnel with growth 14%-point ahead of the national average (Table 2). The primary source of in-migrants is Tórshavn, indicating a suburbanisation trend that still continues (Table 3). Other ‘senders’ are places in the vicinity (Streymoy, West Vágar), although this trend lost momentum lately. Vágar is especially popular with young families, who value the isle for its relatively cheap housing, accessibility and distinct, open culture. For one Danish-Faroese couple, the isle offers best accessibility to both their capitals.

The municipality has always facilitated residential expansion by preparing and selling plots of land (Vága Municipality, 2016a,b; interviews), but demand outnumbers supply (á Rógvi, 2017a). While the municipality welcomed in-migrants for financial benefits, all interviewees expressed how they appreciated newcomers for their fresh look at things, enriching the community with new ideas. Most newcomers have an office job in Tórshavn and thereby also adjust the socio-economic structure of the community. The kindergarten was named imperative to success, as it solves logistics for commuting, often double-income families.

Klaksvík is less clear a story and remains below national growth figures (Table 2). It is difficult to trace back a tunnel effect. Foreign migration went negative and out-migration remained stable and large. Two clear changes include the sudden, stark urbanisation of the Northern Isles to Klaksvík and the suburbanisation from Klaksvík to Eysturoy (Table 3). Klaksvík seems a centre for the peripheral north, but is a periphery itself in the eyes of the local community. This matches empirics; Klaksvík was considered less

TABLE 3. MAIN MIGRATION NET FLOWS (≥ 10) TO/FROM THE CASE COMMUNITIES. SHOWN NUMBERS ARE ABSOLUTE NUMBERS. HÁGSTOVA, 2016, 2017F.

	1997-2001	2002-2006	2007-2011	2012-2016
East Vágur domestic sources		Tórshavn (56) NW Streymoy (13)	Tórshavn (30) NW Streymoy (14)	Tórshavn (10)
East Vágur domestic destinations	Tórshavn (26) West Vágur (11)	Klaksvík (11)		West Vágur (10)
Domestic saldo	-50	+85	+72	-12
Abroad saldo	+86	+63	-69	+26
Klaksvík domestic sources		Northern Isles (16) Suðuroy (13) East Vágur (11)	Northern Isles (75)	Skálafjørður (30) Northern Isles (25)
Klaksvík domestic destinations	Tórshavn (43)	Tórshavn (49) Eastern Eysturoy (16)	Tórshavn (77) Eastern Eysturoy (16) Sundalagið (11)	Tórshavn (34)
Domestic saldo	-49	-20	-19	+18
Abroad saldo	+184	-49	-109	+74

isolated today than in the past, but not a central area either. Interviewees also indicate that most newcomers have pre-existing social connections with the islands. Two causes of the leakage to the capital and Denmark were named by a Growth Assessment: a lack of diversity (culturally and economically) and isolation (Marketminds, 2011). Klaksvík's net growth is mostly the result of high fertility rates.

Figure 22 (Appendix III) highlights migration patterns for 2011-2016. It illustrates that net migration sums are misleading, because the size of individual flows. Klaksvík may lose more than attract migrants, but is an important destination nonetheless.

Commuting

Migration and commuting are intertwined; people base location choices partly on personal stances towards commuting and physical feasibility thereof (Scheiner, 2006; Bjarnason, 2014). The tunnels also offered an opportunity to remain living in Vágur or Klaksvík without having to move. For example, as one interviewee indicated, when in 2006-2010 the recession hit Klaksvík's industry hard, many fired employees found new jobs on Eysturoy, and because of the tunnel they could opt to *not* move but commute. One explained she initially did not want to move home to Klaksvík, as the tunnel enabled close contact with the home community. Later, the long commute (especially in winter), social pull and financial push factors made her move after all.

Statistics show that commuting across the Leirvíksfjørður rose in excess of double digits (+244% daily trips) between 2005 and 2010. In this timeframe, also commuting via the Vágatunnilin increased (+46%), despite being open already since 2002 (Landsverk, 2012). This indicates that changes do not occur overnight. Klaksvík became both a key receiver and sender of commuters, while East Vágur became almost exclusively a sender (Figure 24, Appendix III). Interviewees confirm that interisland commuting is now a natural part of daily life, for both work and study-related travel. It is not something most

people put thought into on a daily basis, although the commute is often appreciated as relaxing time for some.

The increase of commutes is not automatically an increase of commuters. Like people from Suðuroy still practice, commuters between islands would often do this once or twice a week, staying in a pied-à-terre or with family in Tórshavn. The tunnels allowed them to substitute daily for weekly trips and give up their second beds.

Also following trainings, attending meetings, visiting clients and purchasing stocks elsewhere are much easier. *Elsewhere* here almost self-evidently means Tórshavn, since this is where most central, higher-level activities are organised.

Employment

In general, employment seems not to have changed since the tunnels came. Klaksvík has 16 more jobs since 2006 and East Vágar 210 jobs since 2002 (Hagstova, 2017f). The structure changed markedly: fishing and fish processing declined with 11-15%, the public sector grew with 7 and 5%, while industry saw changes in neither community (compared to 2002). Klaksvík's private service sector remained stable, while Vágar's grew with 9%. Meanwhile Tórshavn saw an increase of nearly 1,000 jobs in total (2002-2016). A strong rise in unemployment follows Klaksvík's tunnel opening years, but this correlates mostly to the 2006-2010 recession, interviewees said, and is no issue as of 2017. Overall, the tunnel seems not to be responsible, although it may have accelerated the general transition towards a services-based economy.

Petersen and Poulsen (2013) report that several employers on Vágar now employ people from Streymoy and Eysturoy, which was inconceivable before. Local entrepreneur Gregersen (in Petersen & Poulsen, 2013, p.305) states that "the tunnel is a prerequisite for having so many activities on Vágar", since industry and services now have access to a bigger and better labour force, and there is more clientele for their products and services. The 2011 commuting data confirm that commuting from Vágar to other islands (disregarding Tórshavn) occurs, but this is quite rare (6% of East Vágar's commuters).

Retail and shopping

With shorter, cheaper and easier travel, two previously separated service areas suddenly overlap and competition thus increased. Both communities expected an increase in clientele and revenue after the tunnels came, with different outcomes for Klaksvík and Vágar. Klaksvík has become the new regional shopping centre for Eastern Eysturoy; its service area now covers 16,000 people, which is more than double the population of its own region (IPC, 2011). It is in direct competition with Runavík and Tórshavn now. Klaksvíkingar shopping elsewhere also happens, but a strong sense to buy locally prevails. Interviewees name this love for the town, as well as its size and 'healthy' distance to Tórshavn as to why the local retail sector has not experienced decline.

The Eysturoyartunnilin causes worries among interviewees however; numbers say the service area will decline to 9,500 people, plus 2,400 for whom Klaksvík and Tórshavn will be equidistant (IPC, 2011). This means enhanced competition, or a return to the pre-Norðoyatunnilin situation.

Vágar lacks a market area beyond its own island: It is marginally closer than Tórshavn for people from Streymoy. Some expected an inflow of new customers while others feared an outflow of businesses (Dalbø & Høgnesen, 1997). No consensus exists among the interviewees about the outcome, but shopping in other islands has taken a flight while the increase of people coming to Vágur is nihil. Despite the outflow of customers, the retail sector remained fairly stable. Interviewees claim that the internet, fewer but bigger shops (economies of scale, Figure 11) and a centralisation in Miðvágur explain in part the decline of businesses; but without these forces, I argue, the loss of customers may have been stronger. Especially Tórshavn attracts customers, often in combination with other travel purposes (e.g. work). Vágur gets visited only in relation to airport travel, on special discount days (*tunnils dagar*), and for specialised stores.



FIGURE 11. A SUPERMARKET IN MIÐVÁGUR, SITUATED IN THE NEW BUSINESS CLUSTER ALONG THE HIGHWAY. SUFFICIENT PARKING IS VITAL FOR SUCCESS. COURTESY OF THE AUTHOR.

Petersen and Poulsen (2013) report that for the retail and logistics sector, the Vágatunnilin plays a pivotal role, as companies can operate standard-sized lorries that previously did not fit on the ferries. Shops are supplied on a daily basis rather than irregularly, while businesses, such as carpenters, take jobs on any island and bring standard-sized vans. Customers can shuttle between the house and shop instead of squeezing all purchases in a single (previously smaller) car, making the timber store in Sandavágur, for example, more attractive to other islanders (Petersen & Poulsen, 2013). Thus, the tunnels increased the labour market for local businesses, opened up new markets, and changed the supply system.

Social life, leisure and events

With regard to social life, leisure and events, a major change is that visits to other islands do no longer require overnight stays. It used to be commonplace to spend the night in Tórshavn when attending a play or concert, to stay overnight in Klaksvík during the traditional festival, or to stay over at friends after a birthday party or after herding the sheep. Others would instead leave early – during the play, concert, festival or birthday party – in order to make the last ferry. In either case, the tunnels relieved people from planning, which was considered a sheer psychological boundary (interviews; Petersen & Poulsen, 2013). Shorter travel times, lack of the hassle of ferries, and a mindset shift from planned to spontaneous travel has decreased the psychological distance between islands, communities and individuals.

Examples interviewees give are varied. An children's and youngsters' camp on Vágur used to be a 'real' camp where people spent the night, but nowadays it is common practice for the offspring to spend the night at the parents, who drive them back and

forth every day (Petersen & Poulsen, 2013). One interviewee lives in Vágur while her parents live in Klaksvík; before 2002 she had to take both ferries. Another now goes hiking every weekend in a different part of the country. The traditional summer weekend festival in Klaksvík might have suffered from the tunnel, as people spend Saturday night at home rather than in Klaksvík. Vágur's nightlife scene has gone extinct following the tunnel, as youngsters started to go out in Tórshavn, while Klaksvík's scene was remained stable as it gained new clientele from Eysturoy and lost clientele to Tórshavn; going out is not restricted to one place anymore.

On the other hand, many interviewees told that some of their social activities are no more frequent than before. Football fans would also in the past travel great lengths to support their team; visiting friends and family happens more spontaneously, but not necessarily more often. Regional festivals and boat races do not receive more people from farther away, interviewees believed. Depending on the type of event and the person, time spent on travel is simply substituted by more time on location or at home.

Nightlife changes have a serious connotation. In ferry times, on Friday and Saturday night most young Vágafólk would return to the parents' and party under the community's watch; or they would go out in Tórshavn and walk (or crawl) safely to their student room. After 2002, the combination of more students staying at home on Vágur and the ease of access to Tórshavn's night life scene by car changed weekly routines. Weekend nights are spent in Tórshavn, which increased drunk driving and consequent fatalities. To tackle this deep community impact, a night bus now guarantees safe trips to town. The experiences for Klaksvík-Eysturoy are unknown to the researcher, apart from the fact that transport still relies on cars and taxis.

Klaksvík interviewees expressed pride when elaborating on how often non-Klaksvík people – “even from Tórshavn” – come to Klaksvík for a day out. They go shopping, swimming in the pool, have a coffee in a café, attend a cultural event and dine in a restaurant before heading home. This is facilitated by good accessibility, but interviewees deemed contextual factors most important here. They dedicate it to a general change of culture, already occurring on the Mainland and now accelerated in the Northern Isles. Fitting in with the new trend is the success of the Spaniastova, a new cultural venue, which since 4-5 years receives great numbers of visitors from Eysturoy (who have “discovered” Klaksvík). New concepts – a second cultural centre (Spinnariíð), an indoor playground, a new city centre, a permanent arts exhibition, or recently calls for a world-class sea aquarium – would partly relate to the fresh look at things (see next paragraphs). However, Klaksvík Municipality puts it (only in its English pages!) perhaps too bluntly:

IN 2006 AN EVENT OCCURRED THAT HAS TRANSFORMED KLAKS VíK FROM A REMOTE FISHING COMMUNITY INTO A FORWARD-THINKING AND RAPIDLY EXPANDING COMMERCIAL HUB. (2007a)

Apart from daytrips, also multi-day domestic tourism has taken a flight during the past decade. Small ferries formed a major barrier to bringing unwieldy campers and caravans. Nowadays it is common to buy such a mobile home and spend multiple short holidays a year in another part of the country. This is often done in concert with festivals, which have popped up rather spontaneously during the last 5-10 years as well. Klaksvík saw the successful introduction of the Summarfestivalurin and Sjómannadagar

events lately. Festivals are becoming the new regional and national meeting places, several interviewees said. Tunnels and bigger ferries (Suðuroy) have enabled a trend, but again contextual cultural factors – increasing wealth, more free time, the desire to travel and explore, desire for social gatherings – seem equally important.

Public services

Vágafólk used to move to Tórshavn for education; now they often remain living in the home community and commute on a daily basis. Klaksvíkingar who go to school in Kambsdalur (Eysturoy) would either go daily by ferry or bundle powers and rent a house nearby, whereas now they ‘pendle’. 18% of all commuters is aged 15-24 (Hagstova, 2011), thus education can be assumed a significant source of travel. According to one interviewee, in rare cases in the past, difficult connections occasionally formed a reason not to follow higher education. Unfortunately no local statistics are available to measure the significance. Klaksvík’s technical college saw no noteworthy changes since 2006 (Hagstova, 2017j).

An issue specifically to Klaksvík is the discussed closure of its regional hospital in response to the Eysturoyartunnilin (á Bertholdsen, 2016). This tunnel will bring Tórshavn’s National Hospital within 40 minutes. The national government first wanted to close down the hospital, but this met great resistance from Klaksvíkingar, to whom it is a symbol of pride and autonomy. They interpret the plans not as a matter of costs-benefits, but as an anti-periphery enterprise. The current political discourse is that Klaksvík’s hospital will specialise in certain treatments such as rehabilitation. Interviewees often proudly emphasised how Eysturoy started using Klaksvík’s hospital and how bad Tórshavn’s is.

Vágar never had a real hospital, so ambulance care has much improved with better accessibility. I assume the increase of survival rates and comfort positively impacted the community indirectly at the individual level. With regard to birth care, one interviewee explained that pregnant women from Vágar used to stay the last week(s) of pregnancy in Tórshavn, now only the last hours. These merits require more analysis though.

Non-social changes in social services include the centralisation of electricity maintenance stations, since the Norðoyatunnilin also forms a link between electricity grids (SEV, 2006). As for Klaksvík’s new deepwater port, built with tunnel debris, the tunnel’s implications are unclear. On the one hand it enables a decentralised logistics chain (Klaksvík Municipality, 2007b), while it may equally facilitate centralisation of port activity to Tórshavn (e.g. interviewee).

Land-use

Miðvágur and Sandavágur have grown considerably since the turn of the millennium, with most areas of ‘urban’ growth around the edges, at short distances from the historic built-up area (Vága Municipality, 2016b). The new districts are of stereotypical suburban character (Figure 12-13). New business areas and the school are situated on the highway, beyond walking distance for most users, and therefore depend on cars for access. Several interviewees mentioned the negative stance towards walking because of the weather, yet also in rare perfect conditions, the urban configuration does not promote non-motorised mobility. The spontaneous talks on the pavement seem to have moved to the petrol station, Miðvágur’s meeting place.



FIGURE 12-13. DIFFERENCES IN URBAN DESIGN IN THE OLDEST AND NEWEST PART OF SØRVÁGUR. THE OLD CENTRE IS BUILT AROUND PEDESTRIAN MOBILITY; LAND-USSES AND BUILDINGS SET IN A CRISSCROSS ORDER. THE ‘SUBURB’ ONLY HAS ONE LAND-USE: RESIDENTIAL. RIGHT ANGLES, BROAD STREETS, SPACIOUS PLOTS AND NEAR THE HIGHWAY, IT IS BUILT ON THE PRINCIPLES OF AUTOMOBILITY. COURTESY OF THE AUTHOR.

In Klaksvík, both sprawling and densification projects have occurred despite the disappointing population growth. New residential areas are situated either far from the town centre or high up the slopes (80 meters altitude, 250 meters from the shore). This demands car transport for in-town travel, to which the municipality has responded by offering a free city bus service. It was popular with children, (I assume) non-driving adults, and the researcher himself. A new retail centre emerged near the tunnel entrance in 2005 and contains typical car-cultured spaces, such as box stores, a drive-in cafeteria and a car showroom (Klaksvík Municipality, 2007). Meanwhile the central isthmus becomes more and more the heart of town, with more activities organised. It is the site of the new city centre, which will include a hotel, studios and shops, as well as a renewed marina. The centre sits on land reclaimed from the sea with tunnel debris.

Thus, in terms of Geurs et al. (2009), the presence of facilities, services and activities that enable transport has improved, while the presence of the infrastructure itself (tunnels and access roads), parked vehicles and traffic seem to have changed without passing a threshold. It would have been nice to visualise the land-use and transport interaction, but statistics, historic satellite imagery and number of hands are lacking.

Social aspects

All interviewees stressed the hassle of living on a timetable. Travel demanded planning ahead, including preparing mentally. One explained she used to check the time and weather long before planned departure when visiting friends, which lengthened experienced travel time and reduced quality time. Many said that schedules constrained relaxation, especially when one wanted to bring a car, as this posed additional uncertainty: Will it fit on the next ferry? Will I be in time for the meeting? The loss of uncertainty and the planning mindset was unanimously appreciated.

In one occasion, schedules were also reported to improve quality time: When visiting Vágar, people from Tórshavn who missed the ferry would often make an unplanned, extra visit to their grandparents in the care home. Nowadays, they “rush past” as soon as their primary appointment has finished. Everything is “much more stressed, stressed,

stressed now”. Several interviews mentioned that time is more valuable now, and 30 minutes by car is already considered far.

Despite the annoyances of planning, queuing and waiting, on-board time was unanimously described as pleasant, as “relaxing time”, a moment for “small talk”. The saloon was an important community space where one would talk to one and everyone, regardless age or status. Opinions about the loss of this were varied; some miss a comparable place, while others think replacements – cafés, living rooms – are adequate substitutions.

Identities

Contrary to expectations, Vágur was not dominated by a strong anti-urban discourse. They accepted Tórshavn as an important part of their daily lives, even though they would not proudly overemphasise this. Many have family in Tórshavn and have lived there themselves. Interviewees went as far as to claim that Vágur effectively has become a “suburb of Havn”. The imagined boundary between rural and urban has dissolved rather than strengthened. For Klaksvík the very opposite is true. While functional boundaries slowly fade, imagined boundaries seem to increase and an anti-Tórshavn identity is heard everywhere. But the route of this boundary is fluid: somewhere after Eastern Eysturoy. Klaksvík self-identifies with the rest of the periphery in – and is a self-appointed spokesperson for – the resentment against the capital.

When asked ‘Have the communities changed’ or ‘Has the community lost its identity’, answers were mostly negative. Though not independent, Vágur still is a distinct island and distinct community. Newcomers have become part of the community, often via their children at school. Klaksvík is still considered an isolated, independent and tight-knit community. According to one interviewee, the only thing that really did change was a shift of discourse. The tunnel’s big opening and new opportunities “gave so many ideas for more”: inspiring businesses, citizens and politics. This, in part, gave rise to many new initiatives such as (earlier mentioned) cafés, venues, events, and the city centre.

Incidentally, the role of Tórshavn changed during the past decades. A century ago, people would rarely visit the capital, except once a year during the national holiday, Ólavsøka. “Now every day is Ólavsøka!”, one interviewee claimed. Indeed, it is the national meeting place, both for scheduled gatherings of all types and for haphazard meetings. The shopping mall is a typical place where islanders would run into each other.

One oft-repeated cliché was that distances “From here to Tórshavn are shorter than [vice versa]”. People from the countryside find it easier to travel long distances than Tórshavners, which – especially for Klaksvíngar – is an expression of the capital’s (flawed) superiority.

The tunnel is still a marker between home and away for especially the older generations. Some are remembered of the ferry times with every ride, but for most, and in particular the young generation, the tunnel is as ordinary a piece of infrastructure as any.

Discussion

The chapter discussed a mix of changes and non-changes. Spatially, functional boundaries have dissolved and regions integrated. Mutual dependency between regions

is strong nowadays; jobs and services have centralised to Tórshavn or Klaksvík, while these lost inhabitants to suburbanisation to the ‘other side’ of the Vestmannaund and Leirvíksfjørður. Many of the described changes indirectly have impacted the very culture in the communities. Daily and weekly routines follow new, flexible timetables and interviewees described the atmosphere in the streets as different. It is completely normal now to drive for every trifle, whether it is two islands away to pick up your daughter after a party or around the corner for buying eggs². Psychologically, the islanders feel less isolated, distances have shrunk, but the perception of distances has yet to catch up.

This is not to say that “everything changed”, although many interviewees would claim this initially. Employment remained relatively stable, slowly continuing the de-industrialisation trend that arrived with the 1990s crisis. Despite strong indications, migration statistics fail to reveal a clear pattern for Klaksvík. Neither Klaksvík nor Vágur experienced social stress from newcomers. Apart from the capital, Vágur and Streymoy remain fairly independent functional regions in practice. The presence of infrastructure, traffic and parked vehicles has changed too marginally to be noteworthy. Other impacts could not be ticked off due to lacking statistics, like local housing price developments and education attendance. In addition, despite my best efforts, I frequently used words as *change* and *differences*, which creates a bias away from possible non-changes. I always asked to name things that did not change, but even there a change discourse is inferred.

Interviewees invariably addressed contextual, sometimes pivotal developments and pressures that explain part of the past decade’s development. These include globalisation, a generally buoyant economy and the increase of personal wealth, upscaling and the rise of the online sector, the housing market in Tórshavn and (alleged) anti-periphery policies by ‘Havn’, short economic recessions, and ever-evolving cultural standards. Tolls were often mentioned as important constraints for their individual travel decisions, which is supported by literature (e.g. Gutiérrez et al., 2016). There was no consensus if the tunnels were the primary or a secondary cause of changes, but all agreed that the tunnels were never the sole driver. They opened a door for developments that might have occurred sooner or later anyway. In any case, the tunnels *accelerated* a process of ‘Mainlandization’.

² Pizza is actually a more appropriate example.

7. “Did it change everything?” - Observations & Interpretation

Interviews do not only deliver concrete answers, but also give insight into how phenomena are perceived and communicated. The effects being clear, it is now time to make sense of observations that I and my interviewees did. Did the tunnels really change everything? By which mechanisms and for what reasons?

7.1 General observations

Sense of continuity

Despite the many changes that were named, regardless of the causes, it is striking to observe the general sense of continuity. When asked how relevant certain changes were, they were often found superficial or normal. It seems as if the many effects do not touch the community in their hearts. Also striking was that the tunnels seem rarely matter of discussion. On general questions – ‘Has life changed?’ – they were always quick to respond with ‘everything!’, as if this is not their own realisation but part of a common discourse. However, when asking about specific changes, they would often discuss with themselves or (in the case of duos) with each other. They did not have their own ideas readily available, which may be a sign that the tunnel’s role in daily life is rarely talked about. They all were quick to defend the need for the upcoming sub-sea tunnels, as if the benefits of the tunnels is self-explanatory and hardly food for thought. The absence of constraints has become so familiar and natural that its merits go unnoticed or undiscussed. On questions if the tunnels indeed have become normal parts of everyday life, answers were affirmative.

Positivity

Part of the sense of continuity must lie in the fact that the tunnels are considered to have brought only positive benefits. On questions like “Does the tunnel have negative effects?” and/or “Would you rather have the ferry than the tunnel?”, all answers were negative. A few interviewees would argue that some individuals faced negative impacts, but that they indirectly, via the community and country as a whole, benefited as well. One example is Vágur’s taxi drivers, whose mainstay was to shuttle between the airport and ferry and had to change jobs, which however was made easier *because of* the tunnel. The general discourse is quite tame, both in public and political discourse.

Another question was: “Would Vágur/Klaksvík have looked different, had the tunnels not been built?”. Answers were either “everything!” or “not really”. Some spelled a situation similar to Sandoy’s (depopulating and forgotten; Appendix II), while others said that the tunnels at most accelerated some processes that would have occurred anyway. A lack of consensus may again indicate that the tunnels’ impacts are hardly topic of table talk.

Two discourses

In speeches, institutions’ websites and tourist discourses, the tunnels are often named ‘the greatest project’ and the opening days as the ‘greatest day’ in Faroese/Vága/Klaksvíkar history. The tunnel company’s motto says “we unite the Faroe

Islands” (Tunnil, 2017). A canon of the Faroe Islands, listing 25 Faroese societal milestones that all children should know, includes the projects (Klein, 2011). Yet none of this marvel and grandeur was mentioned in interviews. Also publications without an educative or political goal fail to mention them. A web page about Klaksvík’s Municipality’s own history (Sølvará, n.d.) does not mention the Norðoyatunnilin; a book about Sørvágur’s past century fails to mention the Vágatunnilin entirely (Jacobsen, 2015). A four-volume account of Leirvík’s history (since Norse times) briefly mentions the tunnel’s construction and political quibbles on the local bypass around town, but economic or social effects go unidentified (Fjallstein, 2011). Neither does the 2012 Transport Plan review the impacts of the sub-sea tunnels (Landsverk, 2012). In a speech, the minister of transport praised the tunnels’ effects, but again without clarifications.

These observations stress the sense of continuity and positivity – or rather the *lack of a negative discourse*. Much-telling is one conversation I had in Klaksvík, where it appeared after a couple of minutes that we had been talking about two different tunnels. The person simply assumed I did research on another tunnel, as he found that a much more impactful. It dates from 1967-69 and connects some small villages that used to take several hours by ferry, or on foot, instead of ‘my’ 25 minute crossing that connected an entire town (five times larger than those villages) to the rest of the country. When asked how ‘his’ tunnel changed Klaksvík, he simply replied that it saved so much travel time and hassle. Upon questions for clarification (“but *how* did it change Klaksvík/those villages as a whole?”), he repeated his first answer. This funny anecdote symbolises people’s overall a-spatial thinking as well as the perception of a status quo.

Community

All interviewees showed great affection to and pride of their own community. This community has strengthened, it seems, rather than loosened. Young adults no longer require to move to Tórshavn, or if they do, they can travel back and forth ‘home’ regularly. The few unrelated newcomers are received with open arms. In line with literature (Gaini, 2011), some interviewees indicated that even though spatial interactions intensified, communities remain rooted in a fixed area (which may expand in reach though; Hovgaard & Kristiansen, 2008). Especially in Klaksvík, the sense of community is cultivated in a discourse of local pride. It seems as if the combination of enhanced access to amenities (such as education, jobs, healthcare) and enhanced access to the home community in the end is the most important impact. One no longer has to trade between the benefits of home and the benefits of elsewhere.

Combining the positivism and continuity, one could argue that the tunnels were not pivotal to societal change, but are nice things to have. Communities could have survived without them. However, I suspect that there is more to it than to conclude that tunnels indeed only have positive effects; see section 7.3.

7.2 Transport-People-Land-use interactions

The results show the Transport-People-Land-use interaction at work in most changes. East Vágar’s spatial structure provides a good illustration of the system. The built space (Land-use) responds to shifting cultural standards (People) and behaviour (People, Transport) as businesses, citizens and municipalities choose car-friendly locations and

car-friendly architectural and urban designs for new buildings, such as schools. This is as much the effect of increasing (desires for) mobility as it is the cause, reinforcing the usefulness of the car while deteriorating conditions for other modes of transport. Non-car owning households may see liveability conditions deteriorate as they lose access to vital services, but this was not noted in empirics. It seems a *fact of life*.

The example of Vágatunnilin's impact on nightlife and drunk driving provides a grim but excellent example of the same interaction. Transport offered both a way in to Vágur (for students to live) and a way out (for the nightlife scene) to Tórshavn. People's new daily (commuting) and weekly (going out) routines changed, leading to a loss of social control, excessive drinking and traffic mortality. Apart from the first years where the impact on society was sheer, now a solution – bus services enabled by the tunnel – downsizes it to an acceptable level. A cumulative impact was prevented by a feedback mechanism between direct and indirect effects and impacts.

Also the lack of changes can be explained by the model. For example, visiting football games was reported unchanged, as fans already visited all matches the League did not respond to increasing accessibility by extending the competition.

7.3 Evolution, no revolution

As concluded, the meagre yield of negative impacts is striking. Several mechanisms may prevent effects from turning into impacts. Worth mentioning, I did not introduce interviewees to the semantic difference between these words; I used the Danish counterparts of *changes*, *shifts*, *effects* and *differences* interchangeably, hence all interpretation is on the researcher's side.

One primary reason for the perceived lack of disruptions may be normalisation. This may sound obvious for projects that had been completed 11 and 15 years before this research took place, but it is not self-evident. Had genuine impacts occurred, they would recall memories. The tunnels would have become symbols for disruption. This is not the case: Apparently, the changes were either superficial indeed, or were made invisible by other forces. One force is the merit of being better able to 'stay' home – even spending most time in another area – which blinds one for less important drawbacks. Also, important to note is that not everything changed and not all at once. A tipping point did not occur. Travel times fell immediately but tolls gradually; traffic still increases disproportionately. Changes' speed, extent and number are important factors in continuity.

Moreover, not only researchers but also community members must draw on imaginative powers and discourse to recognise causalities in fuzzy, complex systems. Similarly, answers on "What were different had the tunnels not existed" are only known to divine creatures and form epistemological challenges that only imagination and debate can overcome. Apparently the communities hardly use those powers to reflect on the spatial developments. This may be healthy; one could question the relevance of constantly wondering about *Hows* and *What ifs* when it is the current outcome that is lived.

Culturally determined adaptivity and flexibility recurred in interviews. Faroe Islanders are flexible in their minds. Moving to the other side of the country or abroad is normal; being at sea for months or changing jobs as well. Numminen (2010) shows how the

population at large has constantly adapted to changes in resources. Hovgaard (2002) showed how community capacity helped Klaksvík sustain the 1990s crisis. If adaptation is the norm, stasis rather than change is impactful (Magis, 2010). Perhaps the tunnels are therefore trivial – in a culture open for change and used to exploit resources at hand, accessibility simply forms a resource to improve daily lives; a new ‘fish’ in the waters. This cultural trait needs more research however for hard conclusions.

Of relevance too is the sense of ‘ownership’. While SIAs are often done in a setting of a non-local project initiator and opposing community members, the sub-sea tunnels were welcomed by, and via local politicians (‘policy entrepreneurs’), even set on the national agenda by the local communities. Locals were employed in construction and supporting services and their openings were festive, memorable days. The projects were seen as both a gift and something they deserved. The non-profit, merit good character was self-evident and no vulnerable community was overruled by national interests (until recently; Appendix I). In the case of Vágur, an insider told me, the tunnel was seen as pivotal in keeping the airport there. Thus, communities had a sense of ownership and control; they felt honoured, which made the projects legitimate (see Vanclay, 2012). Recent discussions about continuation of tolls put the regional equity question back on the table.

Furthermore, the tunnels form no threat to island identity. Islands are widely used to describe locations (or as statistical units and functional areas), but seem geographic features more than defining cultural constructs. Villages are the primary locus of community (Gaini, 2011). Regional identities can cross islands; local identities create ‘islands’ within islands. Meanwhile the construct Mainland (*meginokið*) is not widely used and its delimitation is fuzzy. Identities and communities become more spatially spread and fluid with increasing mobility, but I failed to identify a Mainland-island binary perception. This adds to the general sense of continuity.

Another possible reason for the tame impacts is that megaprojects are often ‘bigger’ before they open. Before they open, they only exist in discourse that needs constant repetition to be kept alive. After opening, daily practice takes over and discourse dies. In addition, megaprojects’ practical value may be subordinate to their symbolic value, as they serve a goal that is part of an unofficial, bigger plan (Flyvbjerg, 2014). Sometimes that goal is political fame, and sometimes that goal is the vague idea of progress. The public discourse and my interviewees seem to indicate that the Faroese tunnels embody such a discourse: the tunnels had to unite the country, to bring progress and add a new horizon to strive for. One insider interviewee shared that s/he believed that “something just had to happen”, as if the tunnels simply are a way of keeping busy, and once finished, new horizons will be scanned.

Methodological issues may equally have prevented a bigger ‘yield’. During interviews, I would often ask about macro level themes, such as migration and retail, which might have refrained interviewees from sharing individuals’ micro experiences. The issue of road fatalities, for example, was mentioned by few, but I am certain that every interviewee was aware of the realness. They might have pre-interpreted information before sharing. Equally possible is that my questions were not varied enough. Moreover, it is never easy to switch off the spatially thinking brain when talking to non-

geographers about geographic matter. Words such as *space*, *place* and *identity*, but also *mobility* have different meanings for professionals and laymen (see Hokwerda, 2017).

Lastly, let us not forget that in the end, infrastructure is a fairly trivial matter. Even I – a secret ambassador of bicyclism, with a love for public transport – do not *constantly* think about how bad or great this bicycle lane or that bus route is. It is the things that you use them for that matter. For younger generations, the two sub-sea tunnels are no more different than all other infrastructure that was in place before they became conscious about it. For older generations, the tunnels form one in a row of projects (e.g. Jacobsen, in SSL, 2017). Projects that stand no comparison with genuine life lessons.

Summary

A combination of reasons and causes may have prevented deep, fundamental societal changes, or at least the perception thereof. The limited number, speed and extent of effects play a role. A discourse of positivity, partly fed by a sense of ownership and community pride, paints a bright picture and a warm feeling about the long-term effects. The blurred, complex interplay of societal processes and mechanisms make disruptions invisible, as do cultural, psychological and behavioural adaptations in general and the tunnels in particular. Meanwhile triviality is inherent to megaprojects, especially considering that they are not unique when looking at lifetimes and generations. In addition, methodological issues and biases may have prevented more impacts from scratching the surface.

8. Synthesis

Summary and conclusions

The research started with a contextual overview that shows that Vágur's and Klaksvík's tunnels are embedded in a dynamic societal system. The empirical results (Chapter 6) demonstrate that the tunnels and traffic interfered with this system and had various socio-spatial effects. Work, housing, leisure, shopping and social patterns all changed to some degree, even though it draws too far to state that everything changed. The strong decline in travel constraints accelerated processes of centralisation, urbanisation, and increasing everyday (auto)mobility, which dissolves spatial boundaries and increases mutual dependency between villages and Tórshavn. This is what I coined 'Mainlandization'. While Vágur is both in practice and discursively more integrated with Tórshavn, Klaksvík retains much of its autonomy. 'Losses' to Tórshavn are compensated for by more interaction with Eysturoy. The commuting analysis of the 2011 census convincingly captions that the isles are no isolated islands – and so did all other methods.

Perhaps the biggest impact is better conditions for combining home – the locus of which is the broad family and village (Gaini, 2011) – with amenities elsewhere. This in turn indirectly gave rise to the positive aura of the tunnels that cancels out negative impacts. While routines and rhythms, atmospheres, and social spaces have shifted slowly, this was never considered detrimental. Chapter 7 lists several hypothetical mechanisms that explain the continuity. Mechanisms behind this include the changes' own characteristics (e.g. speed), cultural factors, epistemological challenges of societal change, psychological processes (e.g. normalisation) and the very nature of infrastructure. These all form feedback links in the Transport-People-Land-use model, sometimes via untraceable feedbacks and cumulative effects. Also methodological issues could play a role, ranging from a lack of reference data to the researcher himself.

Regardless of the mechanisms behind change, it should be emphasised that not *everything* changed. Travel in relation to sports, schools or family is easier, but not necessarily more frequent. Some hypotheses were rejected, such as the expected traffic impacts and Vágur's weak anti-urban mentality. In fact, only two out of five 'transport impact themes' (Geurs et al., 2009), the usefulness of transport and travel, were found relevant. Social exclusion from increasing mobility went largely unmentioned. Migration to Klaksvík needs further analysis for hard conclusions. Other potential effects and impacts could not be studied due to lacking data, such as land-use changes, housing price developments, domestic tourism and socio-economic indicators. Lastly, methodological issues may play a role; for example the impact of traffic on society runs deeper than what people actively realise (for a summery, Hamersma et al., 2017). Fortunately, this qualitative research has also identified some previously unknown or unreported indications that could be used as hypotheses for future research on Faroese spatialities.

As mentioned, a long list of Transport-People-Land-use interactions form the basis of explaining both social impacts and societal change, as well as the (experienced) lack

thereof. Some of the links were assessed more closely in chapter 7. In order to explain community adaptivity (see Magis, 2010), however, the People domain of the model may be extended with social, cultural and psychological components. The Faroese communities were found resilient both in discourse and practice (interviews; own impressions; Hovgaard, 2002; Apostle et al., 2002; at the macro level: Numminen, 2010).

Comparison with other fixed links

The two case communities show similarities to Førde and Florø (Engebretsen & Gjerdåker, 2010), where Tórshavn-Vágar and Klaksvík-Eysturoy became complimentary after a time of competition. The first offers jobs and services; the other a place of residence and a sense of community. For a meaningful comparison with the Dutch case (Meijer et al., 2012) should I have examined changes in Vestmanna (which became a dead-end in the transport network) rather than East Vágur. Empirics also show a more complicated story than with Northern Iceland: neighbours Vágur and Northern Streymoy remain separate functional areas, and unlike Akureyri, Tórshavn *did* extend its ‘metropolitan area’ into the newly accessible territories.

Compared to the Oresund and Great Belt fixed links (Odgaard et al., 2014; Knowles & Matthiesen, 2009), the Faroese tunnels differ entirely in context and outcome. The constraint reliefs were much lower in relative numbers and the projects were set in a spatial landscape of existing interrelations that could be intensified. Unlike the links to the Danish Isles, the tunnels’ ridership exceeded expectations and has led to the integration of functional regions, but the tunnels are not (longer) surrounded by an aura of national pride. Baldacchino’s (2007) mainland-island dialectics are too ambiguous in the Faroe context to address meaningfully, but indications are that identities hardly moved.

This discussion confirms a cliché: Context is everything. This does not mean that no lessons are to be learnt: the identified mechanisms behind the (perception of) societal change are key to explain how each situation differs. Each of the discussed fixed-links elsewhere is situated in a complex Transport-People-Land-use interaction scheme, where especially the People characteristics render a project’s outcome unique.

Unlike literature on accessibility effects (e.g. Banister & Berechman, 2001; Meijer et al., 2012;), I suspect there is more to improved accessibility than to conclude that fixed links accelerate rather than generate relations. Indeed, many an interview held that the tunnels simply opened a door for various developments, but on the other hand, from a complexity’s perspective (e.g. Duit & Galaz, 2008), infrastructure – despite its marginal role – is one of countless of interacting societal effects that co-produce our world. To put it metaphorically, the tunnels made several out-of-sync cycles resonate with each other, and although the tunnels do not cause the cycles themselves, the resonance does not come out of thin air. However, without the existing cycles – or external and contextual processes – the tunnel were without effect, that is, a road to nowhere.

I do not concur with the claim of Gaini (in Gaini & Jacobsen, 2008, p.122) that Tórshavn always strengthens on the expense of the countryside. Instead, empirics show ever-increasing spatial mutual interdependencies. Even though the capital attracts most services and is under increasing pressure, also Vágur and Klaksvík (or Eysturoy) have benefitted, and by increasing commuting and migration ties, Tórshavn cannot fare

without its 'suburbs' in the countryside. In a sense, the complex adaptive system that the Faroe Islands are has gained complexity. And governance has yet to catch up.

Review of methodology

The chosen methodology delivered a fruitful pathway to answering the research questions. The two case studies combined offered a better insight in the role of contextual factors for societal change. True to qualitative research, not the extent but the range of potential mechanisms behind the societal change emerged, which future research could look in more detail to. Thus, this research's point of gravity is at deduction, proposing theoretical insights than need be tested inductively in future research, although – like any academic empirical piece – also characteristics of inductive approach are present. The lack of quantitatively-assessable indicators made qualitative research an absolute necessity. Fieldwork was both a frightening and fun experience where the many methods and activities have certainly contributed to the data quality, understanding and conclusions. My positionality worked mostly in favour of the research.

No traditional SIA by design, perhaps in retrospect a better title would be *Socio-spatial* or *Spatio-social* Impact Assessment, as this covers the macro (community) and spatial point of gravity better than the word *Social*, which implies also attention on the micro (individual) level. Moreover, the intention was not to assess ideas for improvements. I failed, however, to repress a few observations and ideas.

On a planning note

It is striking that neither project was embedded in a wider, official vision. The lack of SIAs is no shortcoming given the novelty of the concept at the time, but a lack of monitoring and a vision and action-plan to make the most out the new accessibility is striking nonetheless. The national government let the municipalities deal with the outcomes. Perhaps better preparations and cooperation could have optimised the outcome of opportunities, for example in the retail sector, although apparently *even* with the existing institutional inertia, the outcomes were positive (see Olsen, 2009). Another thesis (Justinussen & Fosaa, 2015) and my own observations point out that the Faroese planning 'system' is of the reactive type, responding on an ad hoc basis to changes. Problems are addressed in a project-to-project fashion and sectors seem little integrated. Urban planning, where multiple planning sectors convene, is a relatively new phenomenon that goes not always smoothly (Justinussen & Fosaa, 2015), although the latest plan for Tórshavn (2014) takes promising steps to less incremental and sectoral planning.

The lack of integration and cooperation between and within sectors (i.e. horizontally and vertically), of proactive steps and a penchant for hierarchical systems is visible in countless of issues and projects. A short list includes the ill-prepared Eysturoyartunnilin ('what to do with all the debris?'), towns competing for harbour activity, Tórshavn's housing market and parking problems, tourism management, public transport planning, and Klaksvík's hospital. The sub-sea tunnels show no difference, nor do the 'plans' for the upcoming ones. Vital to understand is that every development is highly political in the Faroe Islands (Gaini, 2011): planning *is* politics, always, and that makes each and every project subject to intrinsic value debates such as equity. This results in strong

competition between municipalities for investments, industry and settlers (Gaini & Jacobsen, 2008, p.281), but also within municipalities.

From the research follows that there is one institutional layer where visions *did* get practiced: the individual level. All interviews demonstrated how individuals responded proactively and reactively – as direct effects and together as cumulative effects – and how the tunnels provided a tool to realise personal needs and dreams. Using planning vocabulary: civil society, not the market and government envisioned and adapted to changes in the first place.

The Faroese system indicates more than a system; there is a specific Faroese ‘planning culture’ (Knieling & Othengrafen, 2015). The ‘planning artefacts’ (formal institutions such as governments, law, policy), the ‘planning environment’ (beliefs and values held by planning practitioners, including politicians) and the social environment (beliefs, assumptions, values and feelings held by society) match each other. For one, planning law dictates new buildings be built within two years after formal approval, which disincentives strategic planning, such as reserving plots for long-term purposes (Act on Building Code, 2012). This is no issue provided that the Faroese mindset in general seems one of ‘letting things run its course’. The ad hoc response to problems paired with self-assumed flexibility is perhaps a cultural trait. Cooperation is, as one study shows, indeed no priority for Faroese citizens (Eythórssón et al., 2015). In terms of Duit and Galaz (2008), Faroese governance focuses on ‘exploitation’ – continuing the status quo – rather than ‘exploration’ (e.g. institutional innovation), as the need to revolutionise the planning approach is not recognised.

Future research on Faroese spatial planning should ideally conduct a long-term monitoring study of the Eysturoyartunnilin; focussing particularly on how governance responds to changes in order to trace ways to improve the institutions (Olsen, 2009). Similar to Vágar and Klaksvík before, the lack of vision is not going to deliver nightmares, as the informal institutions (e.g. norms, habits) render change normal. However, some fields – housing, retail, infrastructure, ports – could benefit from finding mutual dependencies (which this research did) and from establishing shared and mutual goals in order to maximise the use of opportunities (Alexander, 2001). This could include assessing scenarios, regional cooperation schemes and integration sectoral and municipal visions better. So far, the internet has left no traces of any of these processes from happening.

Tunnel Visionary

In the complex adaptive system of Faroese society, the tunnels ‘synced’ processes occurring locally, on the Mainland and worldwide. Statistical tests might have revealed dozens of significant correlations (provided that the necessary data exist), but this research exercise illustrates once again that it is difficult to separate causes and effects meaningfully without a deep dive into this context. Through community resilience and other mechanisms, a tipping point was never near. The ‘equilibrium’ slowly moves while individuals react to day-to-day developments and we muddle through from project to project. A tunnel vision: first A, and we’ll see about B or C later. Nevertheless, this tunnel vision worked out fine, as it matches cultural expectations and adaptivity, while traffic numbers ensure that the tunnels ensure a financial balance as well. Thus, the

negative connotation of tunnel visions is not in place, but rather, they Faroese are *visionary* in their own way.

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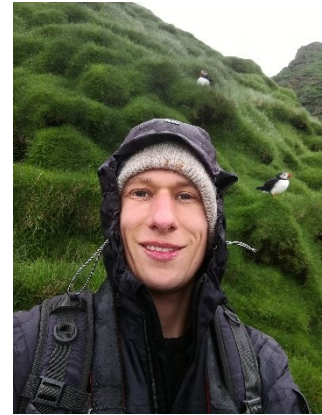
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A personal note

For a planner-to-be, the Faroe Islands may not be the obvious choice. A small dot in the ocean, far off our profession's mental map. However, for me, the islands possess giant appeal. For almost a decade now, I have read about the country, collected plans and maps, and after a holiday trip in 2012, I started to learn to read Faroese and follow the news. It is nothing short of an obsession, one that formed a platform for many creative outings. I designed atlas-loads of maps, plans and designs on spare evenings or for assignments during my bachelor and master in Spatial Planning. Gradually the country became an imagined world, and the more I read, the stronger the urge to experience it in real life. Needless to say, the master thesis formed a golden window of opportunity.



The fieldwork was a mix of fun activities, despair and valuable lessons for life. The first two weeks I stayed at a single parent family in Miðvágur, who did not only take me out to a number of activities – a music festival, a ‘boat festival’, poker, football matches and to see a pilot whale catch – but also offered a warm home and a relaxed conversation partner. I loved how they introduced me to the local community, which I needed, since I am secretly deeply uncomfortable with the phenomenon of interviews. It took great mental effort to arrange them, yet always at great reward. Four were held in Vágur, and five if I count the numerous informal conversations with the family I stayed with. *Túsind takk* Jana for this warm welcome!

My stay in Klaksvík was hard to equal Vágur's, but I enjoyed it nonetheless. The first week was one of despair, but after persisting, I arranged four interviews with some inspiring key community members. It was great to be positioned in this beautiful area and experience a place over an extended period of time, in good and bad weather and during vivid festivals and quiet holidays. The travels across the country soon felt like routines. During such travels, I enjoyed having contact with locals and tourists alike; it's fun to observe how they experience a place in their own ways.

This thesis marks the end of a six year academic career. How would I call myself? I think a planner-geographer-urbanist, as this covers the broad interests and nature of my being. I am a visionary and realist, a man of books and practice, of learning how the world works and of working with this world. I want to fathom a place – and then be critical about it and improve it. The many electives I did (Arctic Studies, Danish, exchange to Montréal, SIA) illustrate my broad interest, which this thesis is the ultimate culmination of.

My hopes are that in the next years, I can develop the creative aspect of urban design to enrich my planning and geography skills. If there is one thing I have learnt, it is that I am no true planner; rather, *also* a planner. Paper should not *only* be the medium of management flow diagrams, protocols and applications, but equally the platform for graphic and spatial design. My curriculum so far forms a good basis to explore the design

world and I look forward to embark on opportunities in the Netherlands, Denmark or beyond.

I want to thank dr. Tim Busscher for his great supervision, which must not have been easy given my stubbornness and solitude, often out of sight. Discussions often derailed off-topic, but somehow we managed to get back on course each time. Of course also a *túsind takk* for the interviewees and all the hospitable people of the Faroe Islands! Furthermore, many thanks to the Arctic Centre for their warmth and their great courses that still inspire me. I'm grateful for the awesome lecturers and professors of the Spatial Sciences department and my Danish teacher (Kirsten, *det er på grund af dig, at jeg kunne komme deroppe!*). However, most thanks go to my awesome friends who gave me enough distraction to make me finish my studies! My mother Carin and her friend Peter deserve all gratitude for the nice evenings and critical questions; Femke for being a sweet sister; and my dad Hero for the great accommodation and mental support. And thanks to the pets for their cuddly help!

On to the next challenge!

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FIGURE 14. BUSES AT THE BUS STATION IN TÓRSHAVN. THE TUNNELS ENABLED DIRECT INTERCITY BUSES TO SØRVÁGUR AND KLAKS VíK, BUT ALSO REMOVED AN INCENTIVE TO USE BUS TRANSPORT IN FAVOUR OF PRIVATE CARS OR TAXIS

Appendix I. Tunnel comparison and traffic development

One of the underlying questions of this research was to what extent traffic across the Leirvíksfjørður and Vestmanna Sund increased. An increase would imply that other societal effects and impacts can be expected, for it is traffic and travel that embody spatial interaction to a large degree (Knowles, 2006). This question is answered after a schematic overview of the two straits and their tunnels.

Travel in past and present

Table x compares the travel constraints for both tunnels before 2002/2006 and at present. It excludes the ferry routes Tórshavn-Klaksvík (twice daily, until 2003(?)), Leirvík-Kalsoy-Klaksvík and Tórshavn-Toftir-Strendur (until 2002(?)). It also excludes the helicopter services between Vágar, Tórshavn and Klaksvík.

TABLE 4. COMPARISON OF THE TWO TUNNELS AND FERRIES.

Vestmanna Sund	Ferry era	Tunnel era	
Frequency	Two ferries, combined 15 trips per day per direction (1999) (extra when high demand)	24 hours/day	
Capacity	30 and 38 cars (1999)	Unlimited	
Crossing time ¹	20 minutes	5 minutes	
Distance Tórshavn-Miðvágur ²	51.7 km	38.9 km	
Travel time Tórshavn-Miðvágur ¹	1:30 h (+0:15)	0:35 h	
Average daily traffic	301 vehicles (2001) ⁶	985 ('03)	2,038 ('16)
Crossing costs per ride ⁴	In 1999:	Winter 2003 ³:	Mid 2017:
- Car, driver plus 1 passenger	€ 13	€ 25	€ 13
- <i>idem</i> , subscription ⁵	?	€ 15 + fee	€ 4 + fee
- Lorry	€ 40	€ 123	€ 40
- <i>idem</i> , subscription ⁵	?	€ 74 + fee	€ 18 + fee
Leirvíksfjørður	Ferry era	Tunnel era	
Frequency	Two ferries, combined 15-18 trips per day per direction (2005)	24 hours/day	
Capacity	30 and 40 cars (2005)	Unlimited	
Crossing time ¹	25 minutes	6 minutes	
Distance Tórshavn-Klaksvík ²	73.5 km	74.1 km	
Travel time Tórshavn-Klaksvík ¹	1:25 h (+0:15)	1:05 h	
Average daily traffic	342 vehicles (2005) ⁶	1,816 ('07)	2,734 ('16)
Crossing costs per ride ⁴	In 2005:	Spring 2006:	Mid 2017:
- Car, driver plus 1 passenger	€ 17	€ 23	€ 13
- <i>idem</i> , subscription ⁵	€ 14	€ 11 + fee	€ 4 + fee

- Lorry	€ 74 to 84	€ 90	€ 40
- <i>idem</i> , subscription ⁵	NA	€ 54 + fee	€ 18 + fee

Direct advantages for users	Time to relax, socialise or prepare tasks	Quick, all-day access; allows spontaneous travel
Direct disadvantages for users	Lack of space; delays due to weather or malfunctions; waiting times	No backup – during road works or emergencies, tunnels close and the link is gone

NOTES: (1) DOES NOT INCLUDE +15 MIN. QUEUEING AND DEBARKATION TIME. (2) INCLUDES SHORTEST DISTANCE ACROSS WATER. (3) 2006 LEVELS: SEE NORÐOYATUNNILIN. (4) DKK-EUR EXCHANGE RATES AS OF 20-08-2017. (5) FERRY ERA: 10 TRIP CARDS, NOT INCLUDING REDUCED FARES FOR STUDENTS ETC. TUNNEL ERA: FOR AVERAGE CARS, AS OF 2017, A 40 TRIP SUBSCRIPTION COSTS € 134 (PLUS € 4 FOR EACH RETURN TRIP) AND A SUBSCRIPTION FOR A UNLIMITED TRAVEL (1 YEAR) COSTS € 67 PER MONTH. HISTORIC PRICES ARE UNKNOWN. (6) IT IS NOT CERTAIN IF NUMBERS ARE ONE-WAY OR BOTH-WAY TRAFFIC.

SOURCES: VINNUMÁLASTÝRIR, 1999; TUNNIL, 2017A,B; SSL, 2005, 2008; PETERSEN & POULSEN, 2013; DALBØ & HØGNESEN, 1997.

The table shows that travel constraints have dropped considerably, but not all at the same pace. While travel time constraints revolted at once, travel times dropped incrementally over time. Timetables, waiting annoyances and capacity constraints were removed instantly though. Bear in mind that car travel remains subject to weather influences (especially in winter and storms), and the Faroese roads require the driver's constant attention. The tunnels did not liberate these constraints, which for two interviewees were still important barriers to daily long-distance commuting.

More cars, more people?

Vehicle ridership boomed after the tunnels opened (Figure 18). The number of vehicles across the Vestmannaund three-folded from 300 to 1,000 per day in the first year; across the Leirvíksfjørður, the number five-folded from circa 350 to 1,800 per day between 2005-2007 (Petersen & Poulsen, 2013; Tunnil, 2003, 2017a-b; SSL, 2008). Numbers temporarily stabilised between 2007-2012, and have since increased weakly exponentially. As of 2017, traffic to Vágur has 7.5-folded and to Klaksvík 9.5-folded compared to the last year of ferry operation (Tunnil, 2017a-b). It is safe to say that the ferries formed a barrier to car traffic that was removed by the tunnels.

However, the question is if actually more *individuals* crossed. This is difficult to answer because of incomplete and unavailable data series of passenger numbers. According to engineering consultant Rambøll (in IPC, 2011), more-less the same number of people now travel in more vehicles through the Norðoyatunnilin, so no new traffic was generated. People stopped parking their car at one quay and quit teaming up; they take their vehicle with them to the other island without maximising the number of passengers. They would not however travel more often in the first place. The increase of traffic thus signals a switch of travel style rather than an increase in real connectivity. If any increase did occur, it lie within the realm of leisure trips (Rambøll, in IPC, 2011). Two other explanations may include (i) the substitution of weekly by daily trips, i.e. more travel without more users; and (ii) substitution of modes. The ferries formed an incentive to bus travel since people had to follow a timetable anyway. People travelled by bus to Leirvík and entered the ferry as pedestrians, whose statistics are unavailable. With the tunnels, bus passengers numbers have dropped (SSL, 2008, 2014-2016; interviews) and people substitute bus by car and taxi travel. The numbers of buses crossing the sounds, which previously did not occur, is marginal to the total traffic.

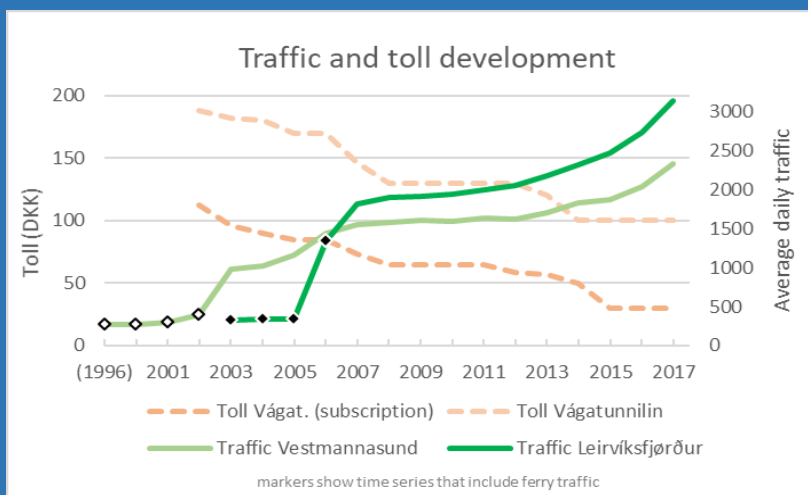
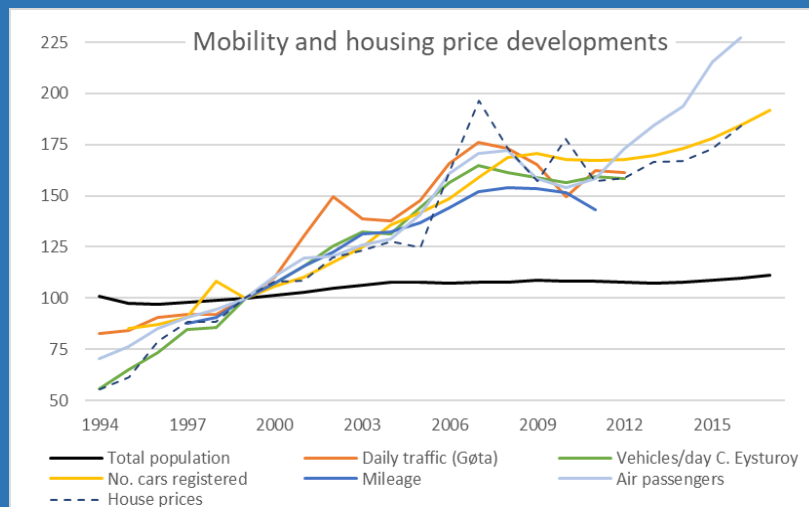


FIGURE 16a (UP). AVERAGE DAILY TRAFFIC ACROSS THE TWO CASE LINKS. NUMBERS FOR 2003 FOR THE NORÐOYATUNNILIN ARE ESTIMATIONS BASED ON OTHER DATA. 2017 NUMBERS ARE EXTRAPOLATED FROM JANUARY-JULY NUMBERS AS COMPARED TO PREVIOUS YEARS. THE YEARS 2000-2002 (VÁGAR) AND 2003-2006 (KLAKS Vík) INCLUDE FERRY TRAFFIC. HAGSTOVA, 2013; LANDSVERKSFRØÐINGURIN, 1999-2002; LANDSVERK, 2003-2012; TUNNIL, 2017; PETERSEN & POULSEN, 2013; DALBØ & HØGNESEN, 1997; SSL, 2006, 2008.

FIGURE 16b (DOWN). INDICES (1999= 100) OF SEVERAL INDICATORS OF INCREASED MOBILITY; AND AVERAGE HOUSING PRICES (STRIPED LINE). ALL OUTNUMBER THE POPULATION GROWTH BY A LARGE MARGIN. SOURCES: HAGSTOVA, 2017A-H.



However, several arguments contradict Rambøll's conclusion:

- The report dates from 2011, just before the onset of new traffic growth. It is at the end of the recession which coincided with a temporary halt on toll reductions; a stabilisation of various indicators of mobility; and a stagnating housing market (Figure 17). This might have given the illusion that traffic on the Norðoyatunnilin did not increase, even though traffic numbers had six-folded by 2011, which is difficult to ignore.
- According to Rambøll, previously car drivers would park at the ferry quay and cross the Vestmannaund or Leirvíksfjörður as foot passengers. Without the alleged generation of traffic, this implies access roads should feature no traffic growth in relation to the tunnels. Figure 27 (Appendix III) indicates that access roads *did* grow in concert with the two tunnels, although this growth follows a long-running development and data series are too fragmented to trace a concrete effect.
- In another study (in Innlendismálaráðið, 2012), Rambøll forecasts traffic numbers for both sub-sea tunnels in 2024 to be circa 1,900 and 2,300 per day, but these numbers were already reached in 2014 and 2015 (Tunnil, 2017).
- For the year 2005 we do know passenger numbers, at 1,084 per day, and if this excludes the drivers of the 342 cars, this would mean 1,426 individuals crossed the

Leirvíksfjørður per day (SSL, 2008). This is almost 400 short of the 1,816 cars that passed in 2007, which logically reasoning required at the very least 1,816 people to drive them. As it is likely that the majority of cars – let alone buses – have more people aboard than the driver alone, also the number of *individuals* crossing to Leirvík or Klaksvík *must* have increased.

- All but one interviewee fully underwrote the increase of interisland traffic. Using anecdotes, they often vividly showed how they themselves, their friends and relatives, and other community members now cross the Vestmannastrandir and Leirvíksfjørður for all sorts of errands. Petersen and Poulsen (2013) stress travel increased considerably.
- The gross underestimation of traffic in original prognosis is telling. The prognoses for the Vágatunnilin read 400 vehicles per day (Tunnil, 2003) and for the Norðoyatunnilin 1,500 per day for the first years (Tunnil, 2006). Underestimations are an atypical trait of infrastructure planning (Flyvbjerg, 2014).

To give a numerical dimension to the traffic substitution and generation, we could look at Sandoy's ferry ridership. They show that for each car, there are four passengers (incl. driver). For 2005, this was also true for the Klaksvík ferry (SSL, 2008). When we assume the ratio is constant and universal, a traffic increase of *more than a fourfold* of vehicle crossings (in the initial years) boil down to a generation of new traffic. The Norðoyatunnilin's traffic five-folded immediately – thus has generated 350 *new* individuals per day – while Vágatunnilin reached four-fold levels after four years. Unfortunately there is no way to see how traffic numbers would have developed had the tunnels not been built.

In conclusion, both traffic and passenger numbers must have increased. The traffic growth is partly due to substitution (weekly to daily; teaming up to driving apart; bus by car), but these effects fall short of explaining the total increase in interisland crossings. The precise role of toll reductions cannot be measured, but interviewees all indicated a strong correlation between toll levels and tunnel usage.

Travel costs

Table 4 includes a comparison of ferry ticket prices now and in the past. During the initial year of the Vágatunnilin, fares were often higher than in the ferry times, but they have succeedingly fallen since (Figure 18). Nowadays there are two fares: full fare and a discount for subscribers, who can choose between a 10/40/100 trips scheme or a monthly fee that allows unlimited passage. Virtually all Klaksvíkingar and Vágafólk, and many Eastern Eysturoy citizens have such a subscription (*hald*). Interviewees unanimously mentioned the importance of the height of the toll fee; in past, they were so high that they formed an artificial boundary. At present, however, the fees are so low that they are not considered a barrier any longer. “You just go!”, “it's nothing you think about!” interviewees said. The step-by-step reduction of tolls coincides roughly with the 2007-2012 stabilisation in traffic, but given the many contextual factors at work (Figure 17), it is impossible to prove a causal relationship.

Despite the low prices, the fact that tolls are raised does create frictions for some. The logistics and touring coach sectors are put at a financial disadvantage that would disturb

a level playing field (Petersen & Poulsen, 2013; interviews). For others, it is not so much the height as it is the principle of tolls: “Why should we pay more for *our* infrastructure than *they* [e.g. Tórshavn] do?”, he asked. On Vágar, a petition circulates that collects signatures to abandon the toll system on the Vágatunnilin, which broke even earlier this year (Abrahamsen, 2017). Other than that, I observed no heated debate in the community about it.

Commuters who commute more than 20 kilometres (one-way) can apply for a travel cost compensation from the national government, which includes a ‘bonus’ for users of ferries and toll tunnels (Taks, 2017). A commute from Miðvágur to Tórshavn entitles to a €3.10 per return trip, from Klaksvík to Tórshavn €4.90.

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Appendix II. Eysturoy and Sandoy tunnels

At present, two new sub-sea projects are underway. The Eysturoyartunnilin between Tórshavn and the Skálafjørður (Southern Eysturoy) is currently under construction, and after the digging has completed, the machinery will move south to commence with the Sandoyartunnilin. The first, due in 2020, is a centre-to-centre project, linking two of the biggest population concentrations. The second, operational in 2023, is an outright centre-to-periphery project, linking the sparsely populated isle of Sandoy to the Mainland. Especially the Eysturoyartunnilin is relevant for this research as it will affect Klaksvík's position in the Faroese spatial landscape. After having discussed these, an inventory of other road projects and of the Eysturoyartunnilin's first social effects are made.

Project overview

As of August 2017, just over 1.5 kilometres of the eleven-kilometre Eysturoyartunnilin have been dug, which will span the strait between Tórshavn and the Skálafjørður (Figure 5, 19) (EST, 2017a). This 15 kilometre long fjord has several relatively large, sprawled settlements on its southern coastlines, with Strendur on the western bank and Runavík and Toftir on the eastern. The latter two combined form the third-largest 'urban' area in the country at 3,200 inhabitants (Hagstova, 2017a). The Eysturoyartunnilin will link the two sides mutually and with Tórshavn, thanks to three entrances and a roundabout beneath the fjord. The tunnel is not necessary in the strict sense, as the three areas are already connected by a road via Eysturoy's interior, but it saves sheer detours (Table 5).

The tunnel's value is not restricted to the approximately 5,000 inhabitants of the Skálafjørður's southern reaches. The region lies central in the Growth Axis (Hovgaard & Kristiansen, 2008) that stretches from Tórshavn to Klaksvík and houses 65-70% of the total population, as well as most economic and population growth. The Norðoyatunnilin filled the northern gap in this axis and the Eysturoyartunnilin will solve the southern missing piece. This also reduces travel times to Tórshavn for other parts of Eysturoy and the Northern Isles, making the project a national gamechanger. Through-traffic can choose between the Runavík (through urban area) and Strendur side (9 minutes longer,

FIGURE 17 (TOP). THE EYSTUROYARTUNNILIN CONSTRUCTION SITE NORTH OF TÓRSHAVN. VAGUELY VISIBLE IN THE BACKGROUND LIE STRENDUR (CENTRE-LEFT) AND TOFTIR (CENTRE-RIGHT), WITH THE ENTRANCE TO THE SKÁLAFJØRÐUR BETWEEN THE TWO (MARKED WITH DOTTED LINE). THE SOUND IN THE MIDDLE OF THE PHOTO IS 5 KM WIDE AND 75 M DEEP (KORTAL.FO, 2017). NORWEGIAN COMPANY NCC EXECUTES THE PROJECT. COURTESY OF THE AUTHOR.

but mostly via modern highway).

The Sandoyartunnilin will be started with when the digging machinery of the Eysturoyartunnilin has finished. Sandoy (1,245 inhabitants) was affected badly by the 1990s crisis and is plagued by severe liveability pressures, such as ageing and degrading service levels (Apostle et al., 2002; Holm & Mortensen, 2007; interviews). As of 2017, 70 out of 270 properties were vacant in ‘capital’ Sandur (Johannesen, 2017b). The strong out-migration – the population fell with 27% since its peak in 1989 – only showed signs of recovery in 2017 (Hagstova, 2017a). The 10.9 kilometre Sandoyartunnilin will replace the current ferry route (30 minutes, 8-9 daily) and should solve the vicious circle (SSL, 2017; EST, 2017b). Unlike the Eysturoyartunnilin, it is unlikely to be of national significance in spatial terms, although it may change the mental map and identities of Sandoy.

TABLE 5. DISTANCE EFFECTS OF THE EYSTUROY AND SANDOY TUNNELS.

Route	As the crow flies	Distance by road in 2017		Distance by road in 2020/2023		
	km.	km.	min.	km.	min.	% change (time)
Tórshavn-Klaksvík (via Runavík)	25.8	74.0	68	39.1	36	-47%
Tórshavn-Runavík	11.2	63.6	59	14.4	17	-71%
Runavík-Strendur	2.0	26.1	28	5.4	7	-75%
Sandoyartunnilin Tórshavn-Sandur	20.0	27.2	67	25.6	32	-52%

SOURCE: KORTAL.FO, 2017; GOOGLEMAPS, 2017; EST, 2017A-B, SSL, 2017. MEASURING LOCATIONS: STEINATÚN, TÓRSHAVN; VIÐ LØKIN, RUNAVÍK; HEYGSVEGUR, STRENDUR; KIRKJUBREKKA, KLAKSVÍK; CHURCH, SANDUR (SANDOY). ASSOCIATED PROJECTS (E.G. INNKOMUVEGURIN) NOT INCLUDED. FERRY SANDOY-TÓRSHAVN (7.7 KM, 30 MIN.) INCLUDES 15 MINUTES MANDATORY QUEUING TIME.

The traffic prognoses for the tunnels are 5,800 vehicles per day through the Eysturoyartunnilin (of which 30% is local traffic across the Skálafjørður) in contrast to only 350-400 vehicles through the Sandoyartunnilin (Kjølbro, 2014). This shows the sheer difference between the type of projects. It is unclear however which effects these prognoses take into account. Spatial changes, induced demand (i.e. increase in usage among existing users) and the toll levels will affect usership. I expect traffic numbers to be considerably higher given the fact that the estimations made for 2024 are already below actual traffic numbers on the Vága- and Norðoyartunnilin (Appendix II). Klaksvík interviewees all pointed out the role of the toll levels in whether they will use it on a daily basis. Had the two tunnels already existed in 2011, disregarding any effects (*ceteris paribus*), circa daily 1,300 commuters experienced shorter commuting distances, while only 140 commuters between Sandoy and the central islands were potential daily users (Hagstova, 2011).

Originally, the two projects were two distinct, unintegrated ventures. The lucrative Eysturoyartunnilin – at that time named the Skálafjarðartunnilin³ – was a private,

³ For more details, consult the Wikipedia article about the Eysturoyartunnil, which I contributed to.

foreign-owned project whereas the unprofitable Sandoyartunnilin would be a public affair. This ownership and financing structure, as well as the costs, routing, timeplan and necessity in general were subjects of national political and societal debate (Gammeltoft-Hansen, 2015). The debate culminated in 2013 when a secret deal between the minister and the principle foreign investor came out, leading to the minister's resignation and two years later – after an official inquiry – to early elections. Meanwhile, the foreign investor had pulled back from the project and Parliament agreed on the present-day structure (Act on Eysturoyar- and Sandoyartunlarnir, 2014). Both tunnels are now one enterprise, owned by the national government through a daughter company. Of the total investment costs (DKK 2.6 billion, € 350 million), 15% is government-subsidised and 85% will be returned through user fees. Once the Eysturoyartunnilin breaks even, tolls will continue to be levied in order to pay off the Sandoyartunnilin. Thus, the centre-to-centre project has indirectly become a regional equity measure as well.

New horizons

As of spring 2017, a debate has (re)started about a fifth sub-sea tunnel to span the 20 kilometre strait between Sandoy and Suðuroy (Landsverk, 2017). Also Suðuroy (4,600 inhabitants) has been plagued by a downward socio-economic spiral during the past three decades. At present, a ferry sails thrice-daily to Tórshavn (2 hours). The minister of transport is from Suðuroy; in a speech I attended, he made the promise that the latest ferry, Smyril V, “will [also] be the last Smyril we got” – implying that the tunnel should be ready before she is due for replacement (see note). Perhaps he said this as an act of political profiling – the audience was also largely from Suðuroy – but the general discourse indicates that this tunnel is a mere matter of time.



FIGURE 18. FERRY QUAY ON SANDOY. AN AMBULANCE AND A CIVIL SERVANT OF THE ENVIRONMENTAL PROTECTION AGENCY WAIT TO EMBARKATION, 5 P.M. THE ARRIVING FERRY WAS MUCH BUSIER AS IT CARRIED THE COMMUTERS HOME AFTER A DAY AT WORK IN TÓRSHAVN. MANY OF THEM WALKED OFF THE FERRY TO THEIR PARKED CARS; SOME EVEN OWN A CAR ON BOTH ISLANDS IN ORDER TO AVOID EXPENSIVE FERRY TICKETS AND CAPACITY PROBLEMS. FERRY QUAYS ARE EMOTIONAL SPACES, AS THE ONE CENTRAL PLACE OF GOODBYE AND WELCOME HOME. LIKE IN VÁGAR AND KLAKSVÍK, THESE SPACES WILL BE REPLACED BY AND DECENTRALISED TO EACH INDIVIDUAL FRONT DOOR (AND THE CAR NEXT TO IT). COURTESY OF THE AUTHOR.

For now, it is interesting to speculate how this will affect Sandoy's position: from a dead-end to a stepping stone. It would restore contact to a neighbour it has been unconnected with since at least 1966 (Roberts, n.d.). Interactivity between them is almost zero, but for much of the area north of them, they represent a single region that stands for economic stagnation, traditional lifestyles and a funny accent.

In addition, several other land-based tunnels are in the works. Landsverk prepares a new tunnel on Suðuroy (to replace a prehistoric tunnel from 1965) as well as smaller tunnels to five villages that especially in winter are difficult to reach (Landsverk, 2016). On the internet, I have come across several other proposals, including one between

Eastern Eysturoy and the Skálafjørður (which would popularise the Strendur route to Tórshavn), the replacement of two aged tunnels in the Northern Isles, and one to Vestmanna. Meanwhile Tórshavn is in discussion about the new entrance highway (*Innkomuvegurin*) that should accommodate the new traffic generated by the Eysturoyartunnilin. The town already has started to suffer from congestion during peak hours and is troubled with parking issues. I doubt if adding car infrastructure alone is the solution to limit cars.

The upcoming and proposed tunnels all lack SIAs or even the slightest piece of discussion of advantages; the benefits seem self-explanatory. This confirms that tunnels, and notably sub-sea tunnels, are both part of a discourse ('tunnels = progress') and a continuous physical development of the landscape and mobility system.

Eysturoyartunnilin's social impacts so far

The following list of impacts is the result from a collection of media material during the months before and in the thesis process.

- Traffic problems in Runavík. Runavík will become a new central town on the Tórshavn-Eastern Eysturoy-Klaksvík route. Lacking a modern bypass, all traffic will push through the built-up area, which has alarmed the mayor (Jacobsen, 2016; KVF, 2017). Originally a bypass was planned, but because the planned entrance of the Eysturoyartunnilin moved to a different site later during the planning process – in order to save a local bird sanctuary and recreation area – it lost its potential value (Old, 2015; Zachariassen, 2016).
- A housing boom in the Skálafjørður (Jacobsen, 2017). Strendur is known as a *blindtarmur*, a dead-end, but the future proximity to Tórshavn has created speculation on the housing market. The mayor welcomes newcomers, but wants to restrict an invasion and social frictions (Weihe, 2017; KVF, 2017; Johannesen, 2017a). Runavík Municipality prepares currently 85 plots of land destined for new housing (Joensen, 2017). In total 40 rental apartments are built in the region; a novelty in the region (Bústaðir, 2016).
- Tórshavn's mayor expects no exodus from Tórshavn to the new 'territories', since this is not happening to for example Kollafjørður, which is already well-connected to Tórshavn (KVF, 2017). Despite suburbanisation, the urbanisation trend be stronger. However, I expect more competition from the new areas, partly because of their bigger population sizes and better location in the country.
- The mayors of Runavík and Tórshavn expect no increased competition between their ports as long as they specialise in their own businesses (KVF, 2017). This is hardly realistic given the Port of Tórshavn's multiple recent and upcoming expansion projects. Both ports use tunnel debris to expand quays.
- The general discourse is that the Skálafjørður becomes a new central area (*miðøki*); consensus lacks as to whether it will compete with or be complementary to Tórshavn.
- As discussed in the main body, Klaksvík's hospital may change its function in response to improved accessibility.

- Entrepreneurs along the old Klaksvík-Tórshavn route (Sundalagið region) fear their future, as numbers of passers-by dwindle from 4,800 vehicles in 2012 to 2,070 in 2014 (Hansen & Mohr, 2016; Landsverk, 2012).
- New uses (apart from the quays) for the generous amounts of tunnel debris are difficult to find; an example of bad preparation on the planning's side. Several environmental impacts have been reported. Its use for quay extensions and roads are controversial.

Note

Once the Sandoyartunnilin opens, it would enable the current Suðuroy ferry to have a shorter route. Tórshavn-Suðuroy takes 2 hours, Sandur-Suðuroy would take only 1 hour. This does not affect overall travel times considerably, but would allow the ferry to sail more trips. Minister Henrik Old opposed to my idea, for three reasons: Firstly, building two new terminals is not cheap and certainly not worth the money when (not if) a Suðuroyartunnil will be built soon afterwards. Secondly, more trips are not necessary since most people use the morning and afternoon trips, like nowadays. Thirdly, he loves how the ferry squeezes herself into Tórshavn's tiny port, passing the prime minister's office at some 25 meters and docking a mere 98 meters (Kortal.fo, 2017) from his window – reminding each and everyone of Suðuroy's existence.

References

This list only includes those not mentioned in the thesis' main list of references.

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Appendix III. Maps and visualisations

Next pages feature various large-scale maps and visualisations that support the main text.

NB. Much image detail is lost in pdfs. Better quality is to be obtained in Word files (upon request) or via www.flickr.com/photos/31322479@N04/. This link also provides access to additional photographs.

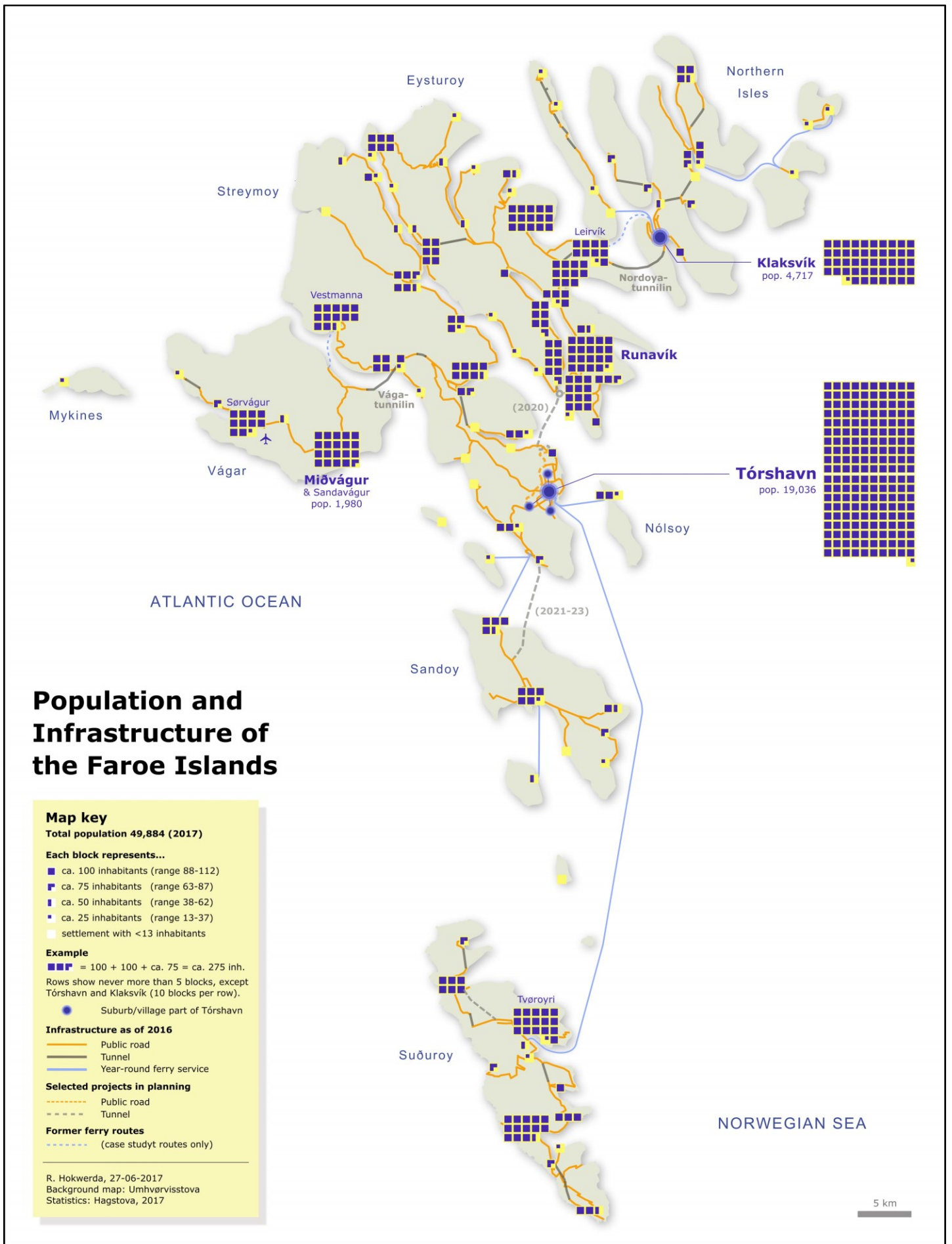
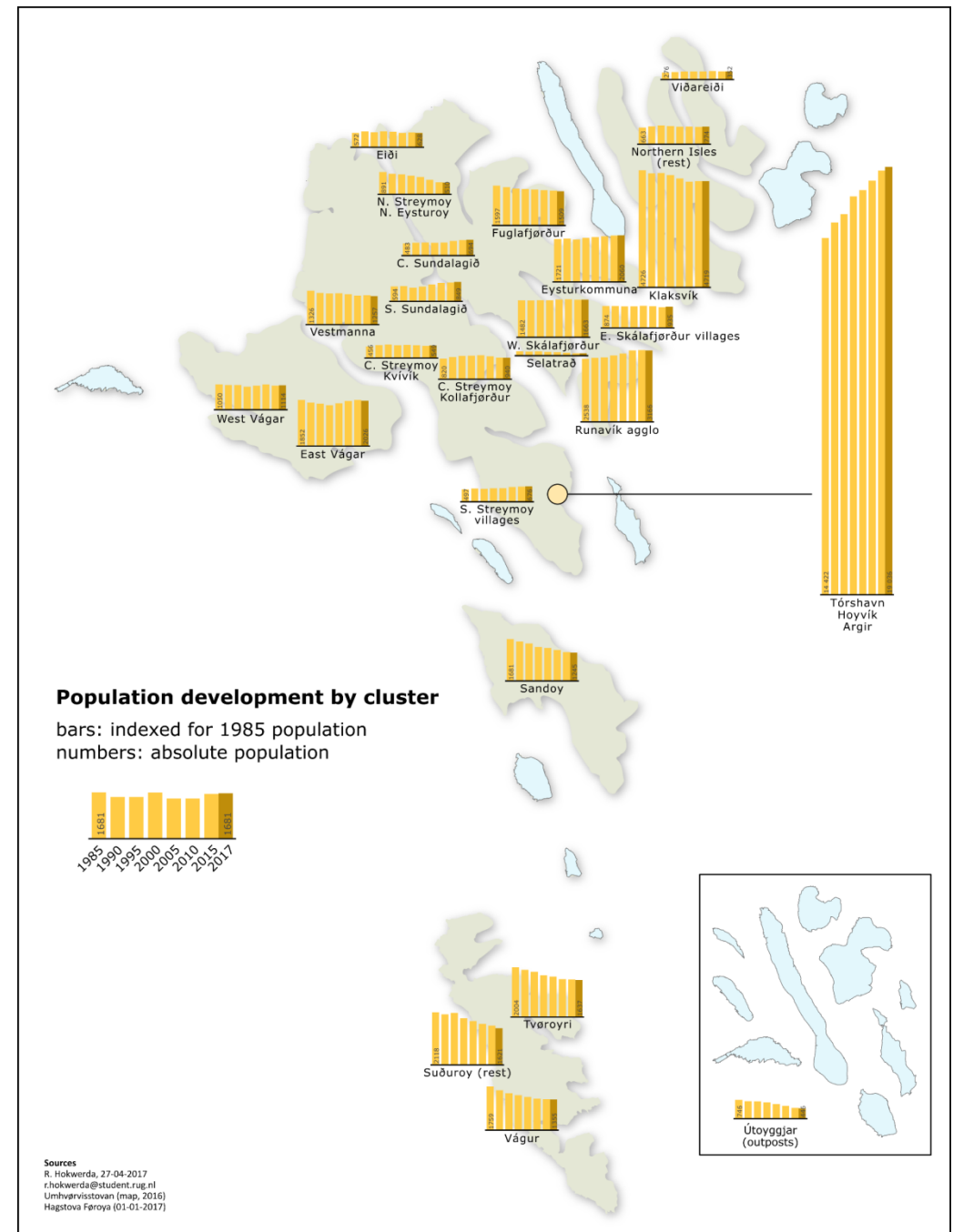
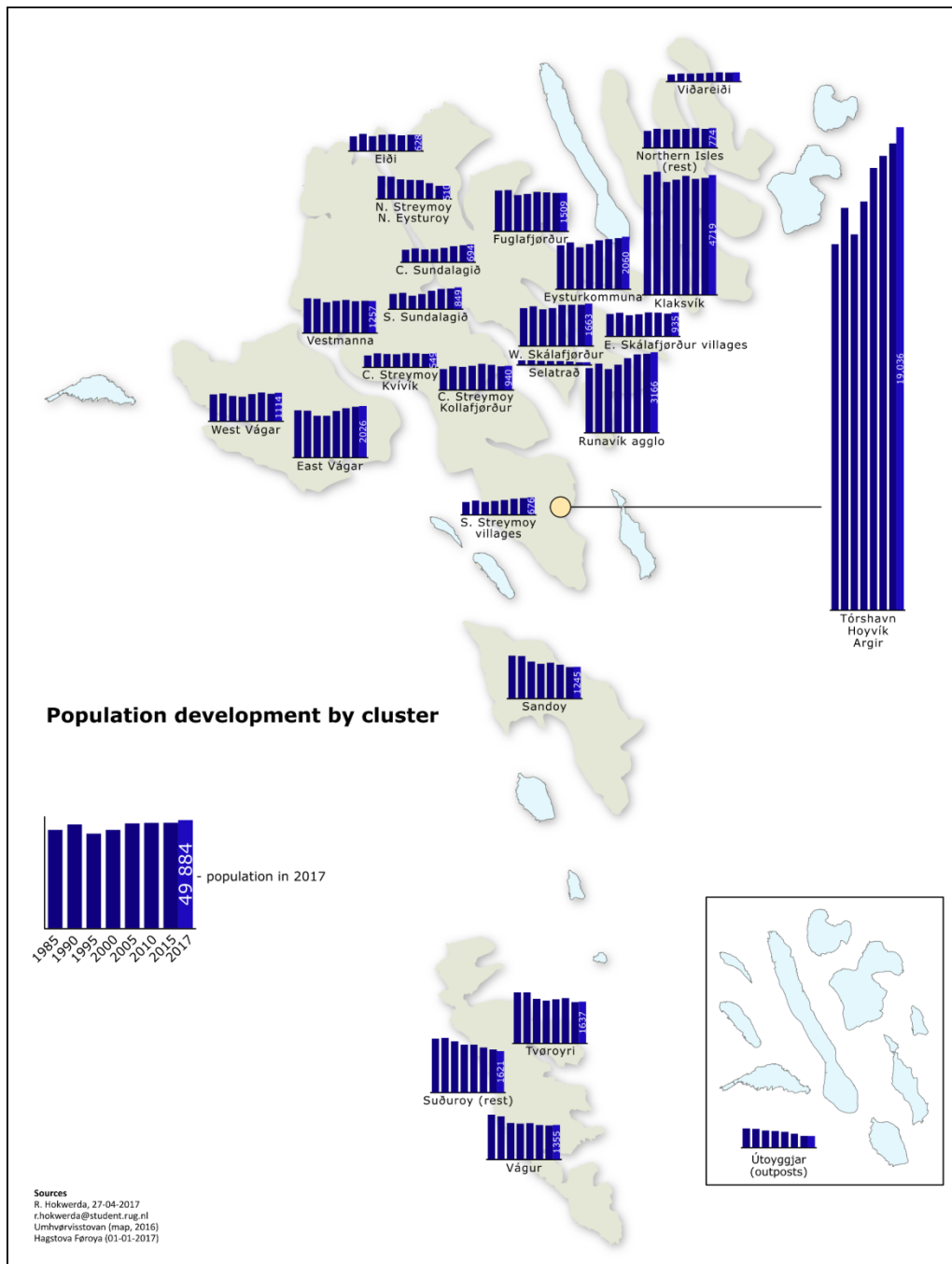


FIGURE 19. POPULATION AND INFRASTRUCTURE OF THE FAROE ISLANDS. COURTESY OF THE AUTHOR.



FIGURES 20 AND 21. POPULATION DEVELOPMENT BY CLUSTER, 1985-2017, IN ABSOLUTE (LEFT) AND RELATIVE (RIGHT) NUMBERS. DATA SOURCE: HAGSTOVA, 2017A.

Migration to/from Vágur and Klaksvík 2011-2015

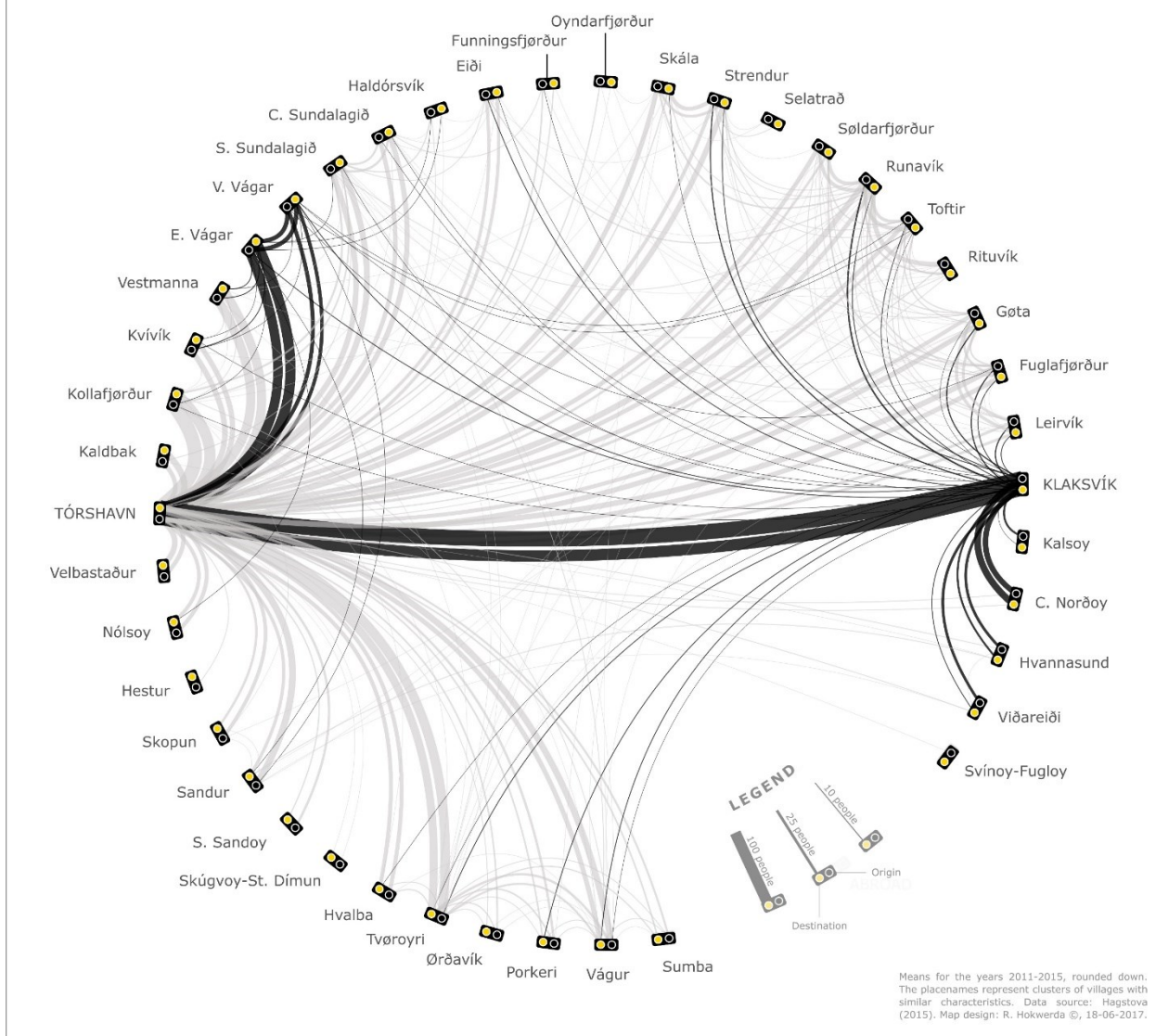
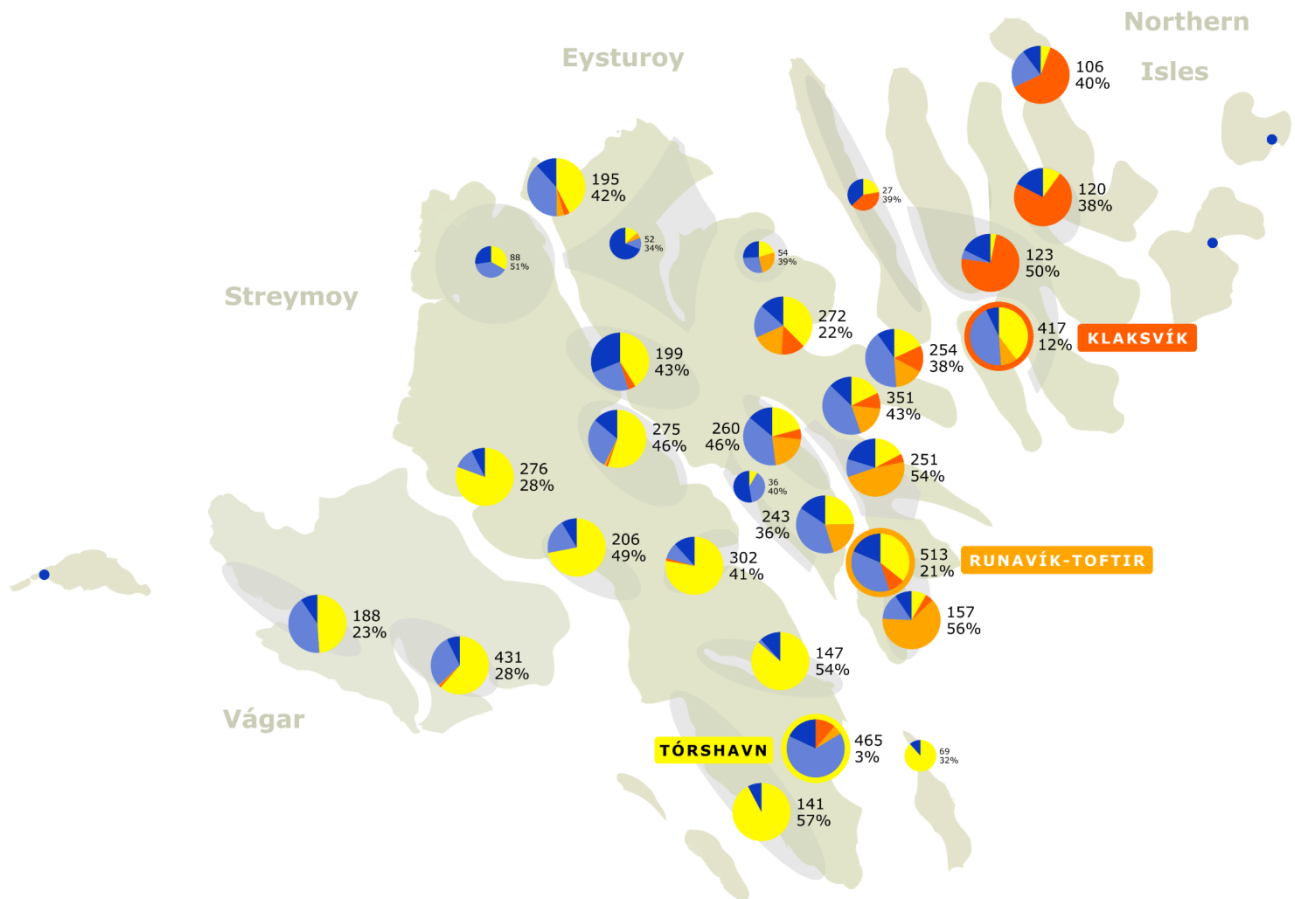
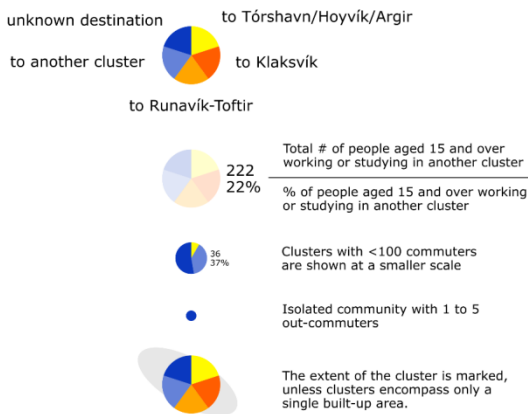


FIGURE 22. MIGRATION PATTERNS BETWEEN 2011-2016, HIGHLIGHTING EAST/WEST VÁGAR AND KLAKSVÍK. MIGRATION TO AND FROM TÓRSHAVN DOMINATES IN EVERY CLUSTER. EXPLANATION: FLOWS TO THE YELLOW DOTS ARE INCOMING FLOWS; FLOWS TO THE BLACK DOTS ARE OUTBOUND FLOWS. DATA SOURCE: HAGSTOVA, 2016.



COMMUTING IN THE FAROE ISLANDS

This map shows where people aged 15 and over are commuting to, either for work or education. Areas with mainly villages have been aggregated into clusters which were designed on the basis of population size and accessibility. Commuting within the home town or cluster has been removed, although the category Unknown Destination may include local trips (note 1). Data are from the 2011 census.



NOTE: For reasons of data confidentiality, the dataset does not list commuting flows smaller than 3. This particularly affects flows between smaller villages, since these do not have the capacity to send more than two individuals to each and every other village. Saksun, for example, sends 3 individuals to Tórshavn but might also be sending 2 to Streymnes and 2 to Hvalvík. However, the latter two duos do not show up in the dataset. Since the total sum of commuters per village is known (in the case of Saksun: 3+77+77=7 out-commuters), we know that on cluster level 14% of all commuters have an unrecorded destination. This forms the category Destination Unknown and may include trips within the single village or cluster, which were otherwise removed from the analysis.

Sources
R. Hokwerda, 27-06-2017
r.hokwerda@student.rug.nl
Background map: Umhørvísstova
Statistics: Hagstova Føroya (2011)

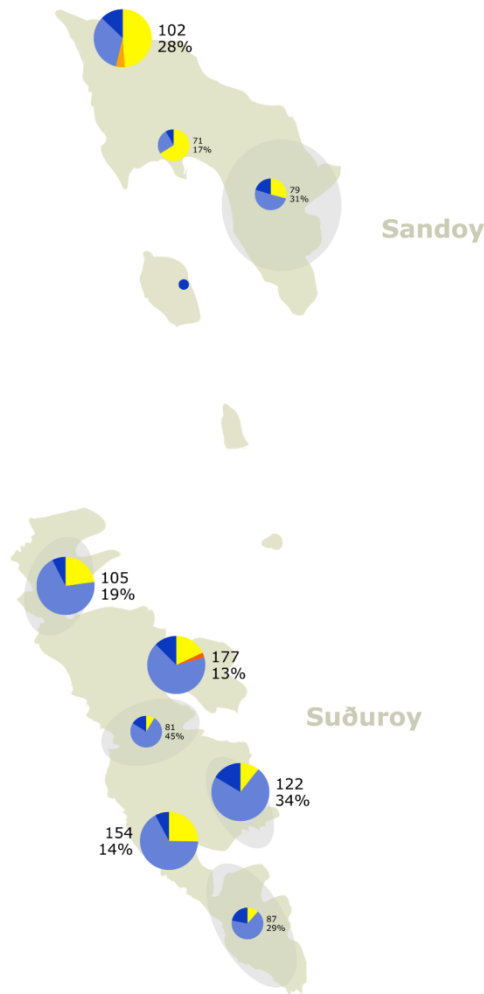


FIGURE 23. COMMUTING BY CLUSTER, 2011. DATA SOURCE: HAGSTOVA, 2011. MAP DESIGN BY AUTHOR.

Commuting to/from Vágar and Klaksvík

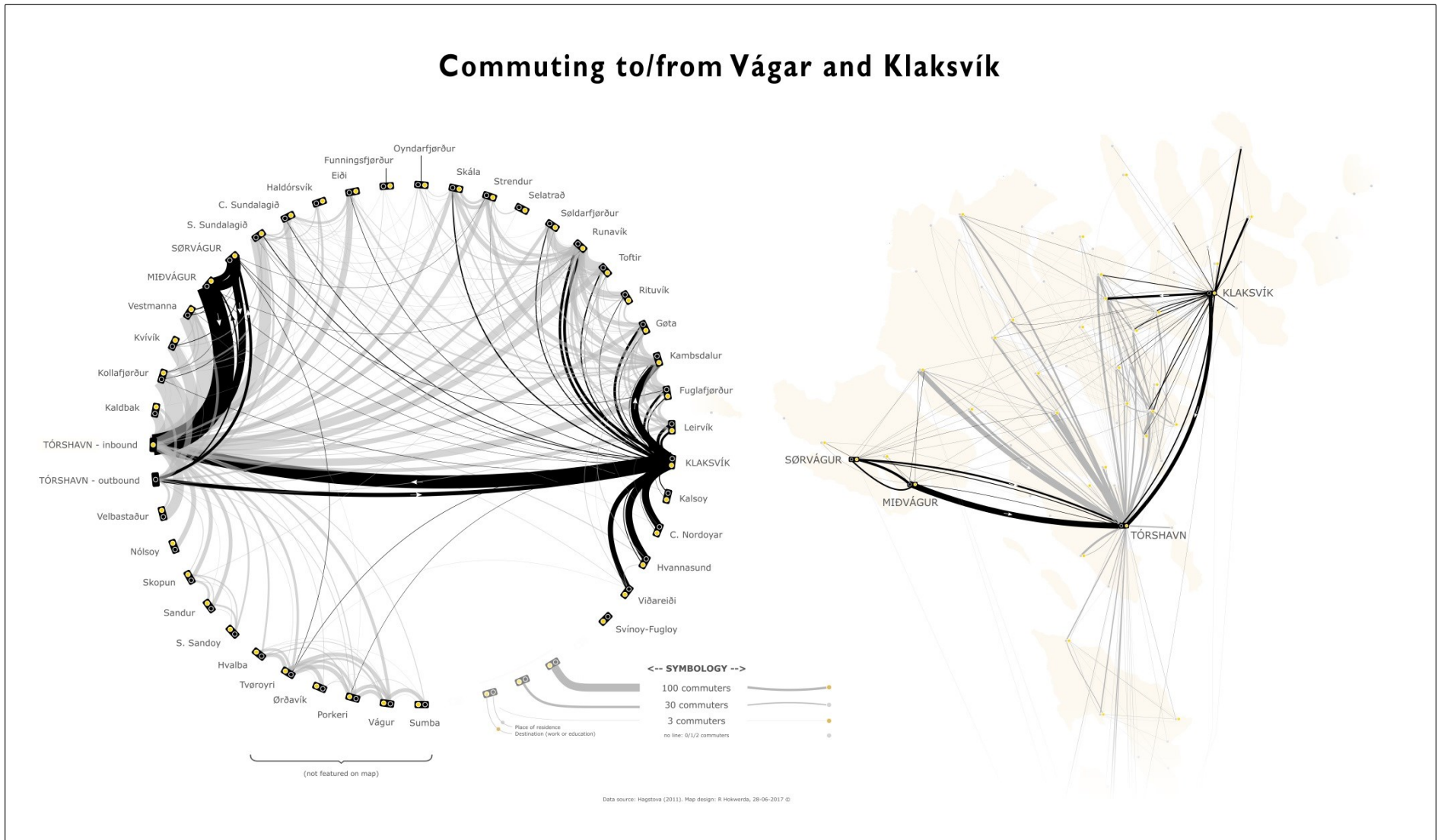


FIGURE 24. COMMUTING PATTERNS IN THE FAROE ISLANDS, HIGHLIGHTING FLOWS TO/FROM VÁGAR AND KLAKSVÍK. DATA SOURCE: HAGSTOVA, 2011. DESIGN BY THE AUTHOR.

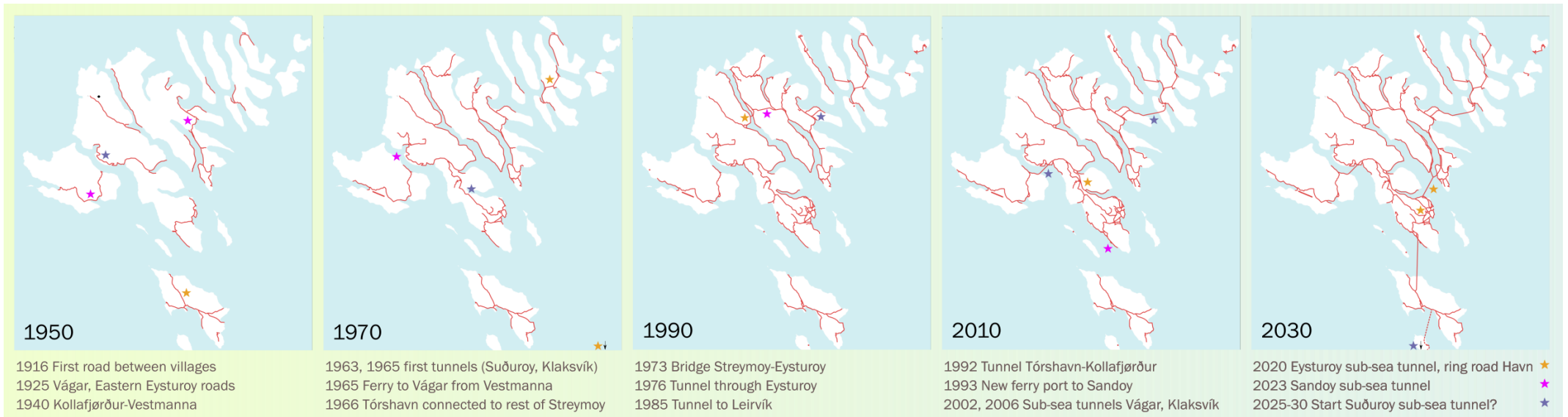
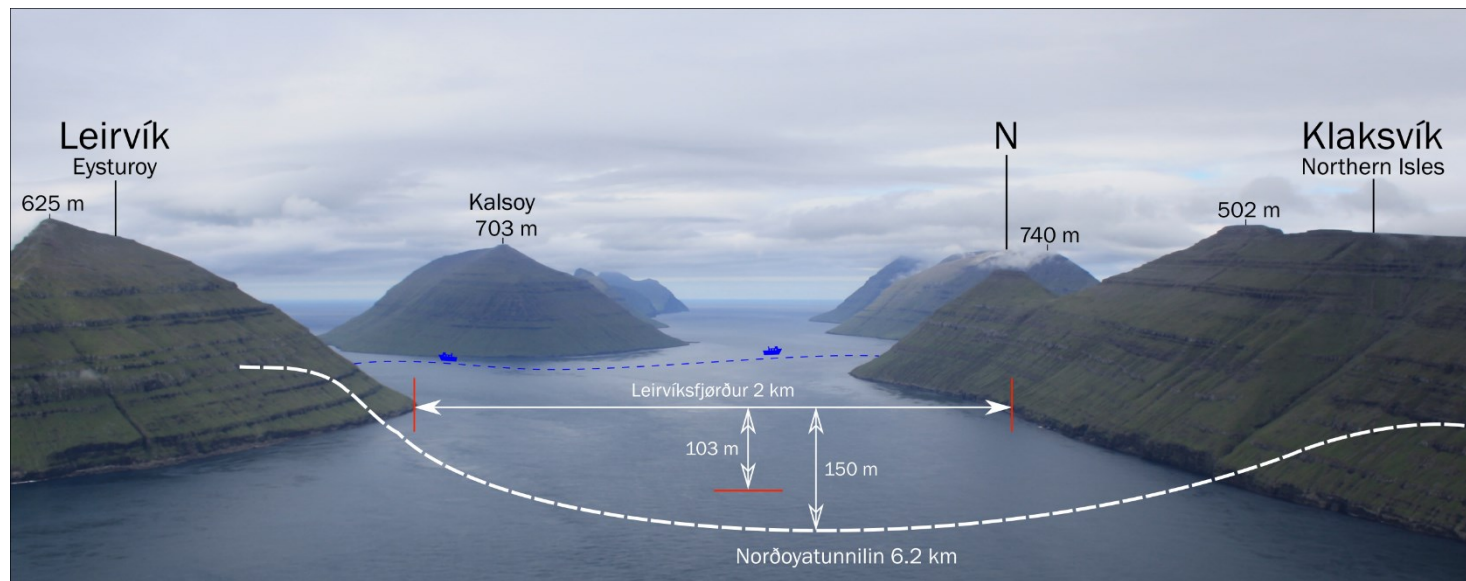


FIGURE 25 (UP). DEVELOPMENT OF ROAD INFRASTRUCTURE, 1950-2030. EACH MAP HIGHLIGHTS THREE OR FOUR PROJECTS OF INTERREGIONAL IMPORTANCE. MIND THAT THE ISLE OF SUÐUROY IS NOT DISPLAYED. THE COMPOSITE WAS MADE IN 2014-2015 BASED ON INFORMATION FROM LANDSVERK.

FIGURE 26 (DOWN). AN AERIAL VIEW OVER THE LEIRVÍKSFJØRÐUR STRAIT. COURTESY OF THE AUTHOR.



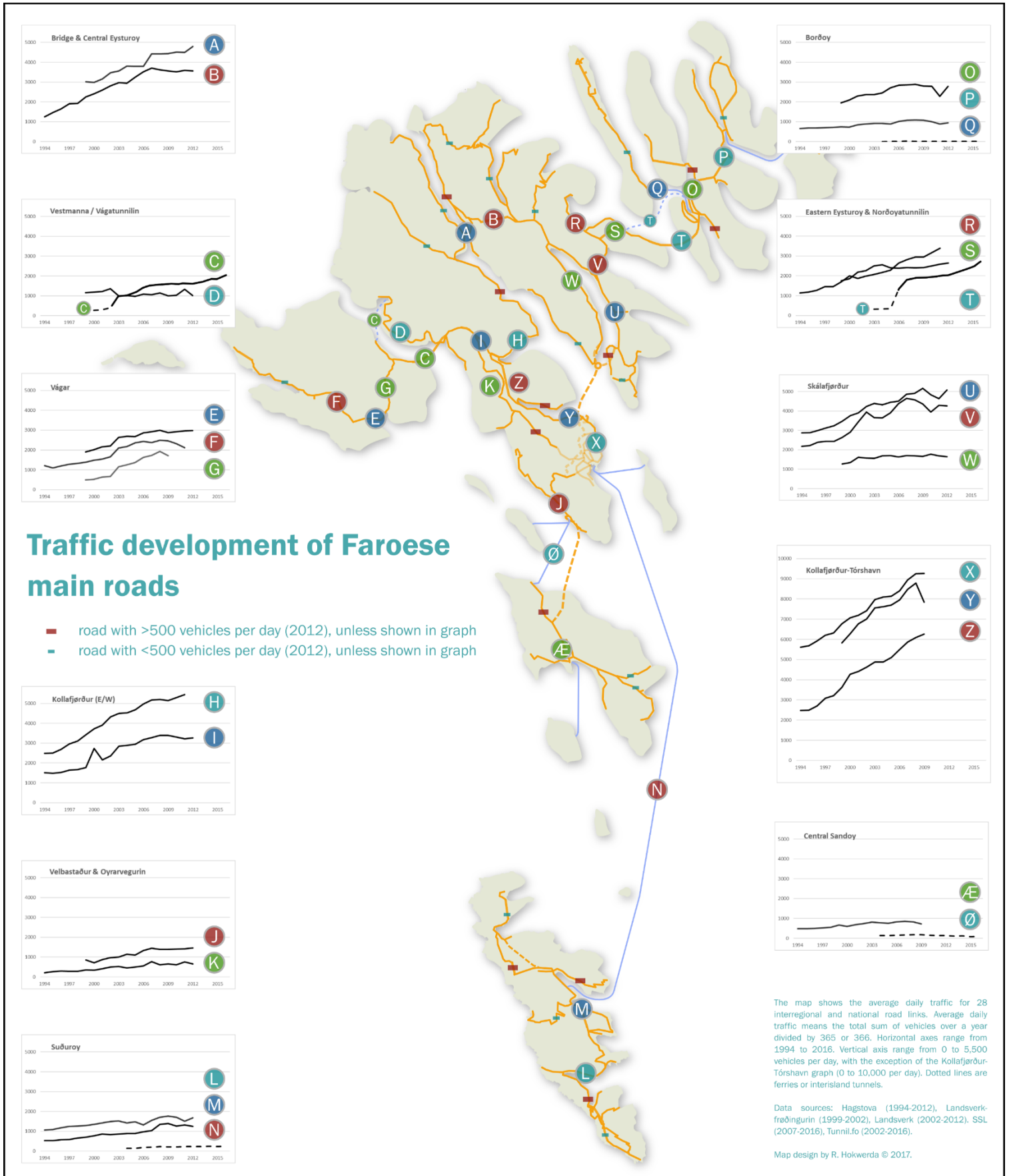
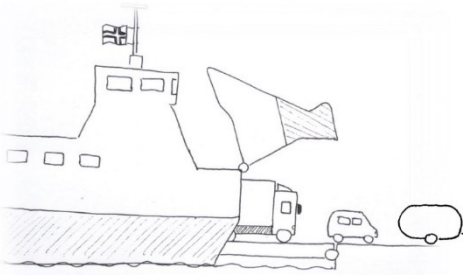


FIGURE 27. AVERAGE DAILY TRAFFIC AT SELECTED THOROUGHFARES, 1994-2016. FOR CLARIFICATION: THE Y AXIS TOP OF EACH GRAPH IS AT 5,500 VEHICLES PER DAY, EXCEPT FOR GRAPH XYZ, WHICH RANGES TO 10,000 PER DAY. DOTTED LINES INDICATE CAR FERRY ROUTES. DATA SOURCE IN IMAGE. MAP DESIGN BY THE AUTHOR.

FIGURE 28 (NEXT PAGE). POSTER AS PRESENTED ON 29-06-2017. ORIGINAL SIZE A1. NOTE THAT IT WAS DRAWN DURING ANALYSIS AND CONTAINS SOME ERRORS.



TUNNEL VISION?



2001
TOLL IS THE MAIN BARRIER IF IT WEREN'T FOR THE TOLL IT'S EVERY DAY GLAVSØKA!
(NATIONAL HOLIDAY)
...CREATED SO MANY IDEAS FOR THE TUNNEL IS ONLY ONE CHANCE WE ARE NOW ONE REGION I MOVED TO KLAKSVÍK BECAUSE OF IT
NOW THERE'S A DIFFERENT MENTALITY
NO MORE - WILL I MAKE THE NEXT IT CHANGED EVERYTHING!

HOW HAVE TWO COMMUNITIES IN THE FAROE ISLANDS BEEN IMPACTED BY SUB-SEA TUNNELS?

VÁGAR TUNNEL (2002)
€38,000,000, TOLL €4 ('17)

VÁGAR-TÓRSHAVN
IN 2001: ≥ 1 H 20 M
IN 2002: 0 H 35 M

2040 CARS/DAY IN 2017
475 COMMUTERS USED IT MORE-LESS DAILY IN 2011



NORTHERN TUNNEL (2006)
€53,000,000, TOLL €4 (NOW)

KLAKSVÍK-TÓRSHAVN
IN 2005: ≥ 1 H 35 M
IN 2006: 1 H 00 M

2740 CARS/DAY IN 2017
697 COMMUTERS USE IT ('2011)

METHODOLOGY

1. Eight interviews in Miðvágur and Klaksvík, plus many informal conversations.
2. Statistical analysis of commuting and migration patterns (see handout!).
3. Literature review of other travel-time saving projects for comparison.
4. Academic and Faroese publications.
5. Online news media (subordinate role)



SHOPPING

No direct correlation tunnels + retail sector. Klaksvík expanded as a service centre for Eastern Eysturoy. Vágur grew more dependent on Tórshavn. Logistics and supply is much easier for both customers and retailers nowadays.



LEISURE

Visiting friends and cultural events occur more frequently and spontaneously. Domestic tourism (by camper or boat) and multi-day events are more popular, but single-day activities no longer require overnight stays, changing the nature of leisure.



PSYCHOLOGICAL

No schedules, no waiting, no delays, no uncertainty. It changed the mentality of travel and perception of distance. It also triggered, inspiration for new ideas – and in the case of Klaksvík: increased competition with the capital.



WORK

Commuting increased considerably. Some people changed from a weekly to a daily commute. Employers have access to better workforce. Role tunnel + trends industry is not clear.



LIVING

New 'territories' to settle. Miðvágur grew 11%-point more than the national average. The car and lower housing prices drive this suburbanisation. Newcomers are welcomed by all interviewees.



UNEXPECTED...

Traffic nuisance and safety is no issue. Car-less households cannot survive in villages without help – but no one mentioned this. The tunnels have not become landmarks or symbols (fx. as a border) for regions.



CONTEXTUAL DEVELOPMENTS

(NATION-WIDE TRENDS WHICH THE TUNNELS MAY OR MAY NOT INTERFERE A LITTLE WITH)



WEBSHOPPING
FEWER & BIGGER SHOPS

MORE AIR PASSENGERS (+24% 2006-11) = MORE TRAFFIC TO VÁGAR

ECONOMIC TRANSITION FROM FISHERIES TO KNOWLEDGE

URBANISATION > STRESSED HOUSING MARKET IN TÓRSHAVN > SUBURBANISATION

ONGOING CENTRALISATION OF SERVICES, SOME DECENTRALISATION OF DWELLING & LEISURE

GREATER WEALTH & HIGHER LIFE STANDARDS

INCREASING POPULATION (+3% 2007-17)

TOURISM, OIL

CULTURAL CHANGE

MOBILE LIFESTYLES (+24% MILEAGE 2001-11).

GLOBALISATION

CAR-DEPENDENCY

LESSONS

- > The tunnel's negative impacts are offset by the advantages, feedback mechanisms and many contextual developments.
- > The daily/weekly/annual rhythms, the atmosphere, the mentality and urban landscape changed – thus the place changed, but the perception of change is limited!
- > The tunnels shape and are shaped by a (discursive) urge for progress. This is a 'tunnel vision': the tunnel works because they want it to work.
- > Impossible to isolate the tunnels from context – but also unnecessary.
- > Though limited in number of interviews, the combination of methods did produce new nuances to enrich planning and geography literature.

