

# Report

## Market needs for regional and cross-border public transport services

### Deliverable 3.3

A comparative report with compiled market needs for regional and cross-border public transport services in the partner areas and analysed commonalities/differences in community demand

**Marco Mazouzi / Marian Cihon / Pawel Warszycki**



**INTER  
CONNECT**



European  
Regional  
Development  
Fund



# Report on Market needs for regional and cross-border public transport services

Marco Mazouzi

Marian Cihon

Pawel Warszycki



Hanseatic Institute for Entrepreneurship and Regional Development (HIE-RO) at the University of Rostock / Germany, June 2019

## **Deliverable 3.3:** Market needs for regional and cross-border public transport services

Description: A comparative report with compiled market needs for regional and cross-border public transport services in the partner areas and analysed commonalities/differences in community demand

## **Activity 3.3:** Investigation of market needs for regional and cross-border public transport services

Description: Identify market segments in 5 SB partner areas of interest for the no-car travel option; Research their 'reasons to go'; Analyse framework conditions for regional and cross-border PT services among target groups in the partner areas; Compile information and compare needs among 5 partner areas

## **Activity 3.4:** Analysis of suburban & rural connectivity patterns for public transport

Description: Investigate how PT lines serve suburban/rural community needs in Blekinge, Klaipeda area, Rostock area, Viimsi; Arrange meetings with relevant actors to identify the demand; Prepare 4 thematic studies with conclusions; Compare them among the involved PPs

## Table of Contents

List of Figures.....	6
List of Tables.....	8
List of Abbreviations and Acronyms.....	9
Summary.....	10
1 Introduction.....	13
1.1 INTERCONNECT Project: Background.....	13
1.2 Purpose of the report.....	15
1.3 Methodology used for the preparation of the report.....	16
2 Market Segmentation and examples regarding public transport.....	18
2.1 Tourism and public transport.....	21
2.2 Commuting and public transport.....	24
2.3 Elderly and public transport.....	26
3 Thematic studies.....	31
3.1 Rostock / Mecklenburg-Western Pomerania (Germany).....	32
3.1.1 Population.....	33
3.1.2 Tourism.....	39
3.1.3 Employment and commuting.....	42
3.1.4 Public transport.....	50
3.1.5 Conclusion and recommendations.....	56
3.2 Guldborgsund Kommune (Denmark).....	58
3.2.1 Population.....	59
3.2.2 Tourism.....	65
3.2.3 Employment and commuting.....	66
3.2.4 Public transport.....	70
3.2.5 Conclusion and recommendations.....	73
3.3 Blekinge (Sweden).....	76

3.3.1	Population .....	77
3.3.2	Tourism .....	80
3.3.3	Employment and commuting .....	83
3.3.4	Public transport .....	87
3.3.5	Conclusion and recommendations .....	90
3.4	Pomeranian Voivodeship / Tricity (Poland) .....	92
3.4.1	Population .....	93
3.4.2	Tourism .....	95
3.4.3	Employment and commuting .....	98
3.4.4	Public transport .....	102
3.4.5	Conclusion and recommendations .....	106
3.5	Klaipeda (Lithuania) .....	108
3.5.1	Population .....	111
3.5.2	Tourism .....	113
3.5.3	Employment and commuting .....	115
3.5.4	Public transport .....	118
3.5.5	Conclusion and recommendations .....	121
3.6	Vimsii (Estonia) .....	122
3.6.1	Public Transport in Viimsi Parish .....	123
3.6.2	Conclusion and recommendations .....	128
4	Conclusions and recommendations .....	130
5	References .....	136

## List of Figures

Figure 1: Geographic Area of Interest - INTERCONNECT project, NUTS3 region codes .....	17
Figure 2: Percentage of population aged 65 years or older in 2019 (United Nations 2019) .....	26
Figure 3: Percentage of population aged 65 years or older in 2050 (United Nations 2019) .....	27
Figure 4: Google Maps (2019): Mecklenburg-Western Pomerania [ <a href="http://maps.google.com/maps">http://maps.google.com/maps</a> ; 2019-04-12].....	32
Figure 5: Rostock, district and city area (NDR).....	33
Figure 6: Population Mecklenburg-Western Pomerania 2013-2017 (Eurostat, 2018).....	34
Figure 7: Population change Rostock 2013-2017 (Eurostat, 2018) .....	34
Figure 8: Rostock City, average age development 1985-2017 (Hanse- und Universitätsstadt Rostock 2018 a: 49) ....	35
Figure 9: Population and age distribution MWP (Statistisches Mecklenburg-Vorpommern 2018) .....	36
Figure 10: Population development Rostock and Suburban area 2001-2015 .....	37
Figure 11: In the city centre of Rostock - a major tourist destination in MV (by Andrea Anastasakis on Unsplash) .....	39
Figure 12: The white sand beach of Rostock-Warnemünde (by travelnow.or.crylater on Unsplash).....	40
Figure 13: Arrivals at accommodation facilities (> 9 beds) (Hanse- und Universitätsstadt Rostock 2018 a: 219) .....	41
Figure 14: Unemployment rate MWP 2005-2017 (Statistisches Amt Mecklenburg-Vorpommern 2018: 368) .....	43
Figure 15: Rostock, in and outbound commuters 2010 – 2017 (Hanse- und Universitätsstadt Rostock 2018 a: 118) .	44
Figure 16: Main means of transport of respondents (Hansestadt Rostock 2012) .....	45
Figure 17: Rostock, in and outbound commuting (Hanse- und Universitätsstadt Rostock 2018 a: 118) .....	46
Figure 18: Outbound commuters from the City to the District (Hanse- und Universitätsstadt Rostock 2018 a: 118) ....	47
Figure 19: Inbound commuters from the District to the City (Hanse- und Universitätsstadt Rostock 2018 a: 121).....	48
Figure 20: District Rostock: regional train line coverage (base map: Hanse- und Universitätsstadt Rostock 2018).....	49
Figure 21: VVW area [ <a href="https://www.verkehrsverbund-warnow.de/karten-plaene/verbundgebiet.html">https://www.verkehrsverbund-warnow.de/karten-plaene/verbundgebiet.html</a> ; 2019-04-30] .....	51
Figure 22: Public transport plan of District Rostock (VVW 2019).....	52
Figure 23: Transported persons by Rostock PT [millions] (Hanse- und Universitätsstadt Rostock 2018 a: 207) .....	53
Figure 24: Distribution of ticket income between the PT providers (VVW 2016 b).....	54
Figure 25: Google Maps (2019): Guldborgsund Kommune [ <a href="http://maps.google.com/maps">http://maps.google.com/maps</a> ; 2019-04-12].....	58
Figure 26: Guldborgsund Population Development 2011-2017 (Blickle et. al. 2019).....	59
Figure 27: People of Guldborgsund Municipality living in urban and rural areas (Brinkhoff 2019 b).....	60
Figure 28: Age distribution (Brinkhoff 2019 b) .....	60
Figure 29: Age distribution (Brinkhoff 2019 b) .....	60
Figure 30: Population Forecast Guldborgsund 2015-2028 (COWI 2015) .....	61
Figure 31: Nationalities of Guldborgsund Municipality inhabitants (Brinkhoff 2019 b) .....	61
Figure 32: Country of birth of Guldborgsund Municipality inhabitants (Brinkhoff 2019 b) .....	62
Figure 33: Population development forecast by age group (COWI 2015) .....	63
Figure 34: Relative age distribution 2015 (Guldborgsund) and 2028 (Guldborgsund and national level forecast) .....	64
Figure 35: Indexed population development within different settlement types (COWI 2015).....	64
Figure 36: The 10 largest enterprises within Guldborgsund Municipality (Centre for Vækstanalyse 2018: 6) .....	67
Figure 37: Private companies by sector 2014 (Centre for Vækstanalyse 2018: 7) .....	68
Figure 38: Employees of private companies by sector 2015 (Centre for Vækstanalyse 2018: 7).....	68
Figure 39: Employees per sector and commute (Centre for Vækstanalyse 2018: 15).....	69

Figure 40: Employees by commuting and education/training (Center for Vækstanalyse 2018: 15)..... 69

Figure 41: Commuting distances to workplaces (Centre for Vækstanalyse 2018: 17)..... 70

Figure 42: Movia bus lines in Guldborgsund Municipality (Movia 2017) ..... 72

Figure 43: Google Maps (2019): Blekinge province..... 76

Figure 44: Blekinge province inhabitancy trend 2014-2018 (UrbiStat 2018a)..... 77

Figure 45: Blekinge population development 2011 – 2017 (Blickle et. al. 2019)..... 78

Figure 46: Blekinge province age distribution by gender, Blekinge province (UrbiStat, 2018b)..... 79

Figure 47: Average age in municipalities of Blekinge province (UrbiStat, 2018c) ..... 80

Figure 48: Stena Line: Karlskrona - Gdynia, Development of Freight / Cars volumes ..... 83

Figure 49: Stena Line: Karlskrona - Gdynia, Development of Guest's Volumes (1995 - 2017) (Stena Line, 2018b) .... 83

Figure 50: Number of companies by municipality (Blekinge Business, 2018)..... 85

Figure 51: Number of commuters in Blekinge, 2017 (Statistics Sweden, 2018) ..... 86

Figure 52: Map of Public Transport in Blekinge 2018 (Blekingetrafiken, 2018a) ..... 88

Figure 53: Karlskrona Public Transport Map [Blekingetrafiken, 2018b)..... 89

Figure 54: Pomeranian Voivodeship (Google Maps, 2019) ..... 92

Figure 55: Population Change Pomorskie (PL63) (Eurostat, 2018)..... 94

Figure 56: Population Change Pomorskie (PL63) (Eurostat 2018)..... 94

Figure 57: Population change Trojmiejski (PL633) (Eurostat 2018) ..... 95

Figure 58: Tourists Visiting Pomorskie, in millions (Urząd Statystyczny w Gdańsku, 2018)..... 96

Figure 59: Foreign tourism in Pomerania in 2018 (Urząd Statystyczny w Gdańsku 2018) ..... 96

Figure 60: Tourist attractions and number of visitors (Pomorska Regionalna Organizacja Turystyczna, 2017) ..... 97

Figure 61: Sopot Molo, Karolina Grabowska/Pixabay ..... 97

Figure 62: Job accessibility within 60 minutes by PT (left) and car (right) (TRACC 2013)..... 99

Figure 63: Transportation in Poland by train, motor coaches and passenger cars (Eurostat 2017) ..... 100

Figure 64: Modal split in the Tricity metropolitan area 2014 (Reported by PP7/Innobaltica) ..... 100

Figure 65: Spatial Scope of the Metropolitan Area in Pomeranian Voivodeship (STIM 2015) ..... 101

Figure 66: Public Transport Network in Tricity Metropolitan Area (STIM 2015) ..... 103

Figure 67: TRISTAR traffic management centre, Gdańsk (Photo: Marian Cihon) ..... 104

Figure 68: Rapid Urban Rail/SKM lines in Tricity, 2018..... 105

Figure 69: Accessibility potential to population in 2011. (TRACC, 2013)..... 107

Figure 70: Klaipeda (Lithuania) (Google Maps, 2019) ..... 108

Figure 71: Map of Klaipeda County (Lithuanian Ministry of International Affairs, 2019) ..... 110

Figure 72: Population change in Lithuania (2013-2017) (Eurostat, 2019) ..... 111

Figure 73: Population change in Klaipeda county (2013-2017) (Eurostat, 2019)..... 112

Figure 74: Population structure by main age groups 2008 (Lithuanian Department of Statistics 2008)..... 112

Figure 75: International tourists' arrivals (2018) (Lithuania Travel, Statistics Lithuania) ..... 113

Figure 76: Cruise shipping in Klaipeda (Port of Klaipeda, 2018) ..... 114

Figure 77: Modal split of the transport in Klaipeda (Klaipeda Public Transport Authority) ..... 116

Figure 78: Public Transport Network: City vs. region lines (Klaipeda Public Transport Authority) ..... 117

Figure 79: Public Transport Network: Trips in total (Klaipeda Public Transport Authority) ..... 117

Figure 80: Transportation in Lithuania - modal split (Eurostat, 2019) ..... 118

Figure 81: Train lines in Lithuania (Lithuanian Railways 2019)..... 119

Figure 82: Line 23 bus in Klaipeda City (Photo: Marian Cihon) ..... 120

Figure 83: Klaipeda tariff zones (Klaipeda Public Transport Authority, Google Maps 2019) ..... 121

Figure 84: Google Maps (2019): Viimsi Vald [http://maps.google.com/maps; 2019-04-12] ..... 122

Figure 85: Harju County: Municipalities (Saar 2018) ..... 123

Figure 86: Viimsi Parish Public Transport Network (Saar 2018)..... 125

Figure 87: Congested Pirita Street (Saar 2018)..... 126

Figure 88: Public transport vs personal car use (average workday between 6 a.m. and 2 p.m.) (Saar 2018) ..... 127

Figure 89: Future public transport of Viimsi (Saar 2018) ..... 128

## List of Tables

Table 1: Municipalities within Rostock District (Hanse- und Universitätsstadt Rostock 2018 a: 118) ..... 47

Table 2: The 10 largest business employers ..... 66

## List of Abbreviations and Acronyms

<b>BSR</b>	Baltic Sea Region
<b>BTH</b>	Blekinge Tekniska Högskola [Blekinge Institute of Technology]
<b>CBD</b>	Central business district
<b>DB</b>	Deutsche Bahn [German Railways]
<b>DKK</b>	Danish krone
<b>DSB</b>	Danske Statsbaner [Danish State Railways]
<b>EU</b>	European Union
<b>EUSBSR</b>	European Union Strategy for the Baltic Sea Region
<b>HIE-RO</b>	Hanseatic Institute for Entrepreneurship and Regional Development at the University of Rostock
<b>IT</b>	Information technology
<b>JBA</b>	Journey-based affect
<b>MWP</b>	Mecklenburg-Western Pomerania
<b>MZKZG</b>	Metropolitan Association of Communication Gulf of Gdańsk
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>PETs</b>	Personalised electronic tourist guides
<b>PP</b>	Project partner
<b>PT</b>	Public transport
<b>RSAG</b>	Rostocker Straßenbahn AG
<b>SB</b>	South Baltic
<b>TEN-T</b>	Trans-European Transport Networks
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>VVW</b>	Verkehrsverbund Warnow [Traffic Association Warnow]
<b>WP</b>	Work package

## Summary

The European Union Strategy for the Baltic Sea Region (EUSBSR) flagship project INTERCONNECT addresses the challenge of curbing the car-reliant mobility trend in the South Baltic (SB) area through user-adjusted and more sustainable public transport services for regional and cross-border travels. The current public transport offer hardly meets customer expectations for easiness and appeal of regional and cross-border journeys, with scarce range of integrated ticket options for multimodal rides, difficult access to one-spot passenger information and no clear benefits for users when choosing the public transport over car.

To enhance car-independent mobility in the SB area, the partnership, consisting of 9 formal and 10 associated project partners from 6 countries, carries out joint capacity-building, pilot demonstration and advocacy actions. These tackle the three dimensions of public transport in serving the regional and cross-border travels – the demand, the supply and the governance.

This report represents the third deliverable (3.3, “Market needs for regional and cross-border public transport services”) of Work Package 3 - The Collection of Evidence, Knowledge and Experience. To ensure the regional relevance in gathering the data, the HIE-RO as the leading organisation of WP 3, has involved the other project partners in the development of the report’s structure and in the compilation of market needs for regional and cross-border public transport services in the partner areas and the analysis of travel patterns as well as commonalities and differences in demand for public transport services.

The first thematic chapter is about the corresponding activity 3.3 (*Investigation of market needs for regional and cross-border public transport services*) starting with a theoretical view on market segmentation with regards to public transport services and its user groups. Following this, literature on three of the most important market segments of public transport user groups has been analysed: commuters, tourists and elderly.

Subsequently, a thematic study has been tailored to each of the following regions: Pomorskie, Blekinge, Guldborgsund, Rostock, Klaipeda and Viimsi. The sections on the first five regions are composed of general information on the specific region, and of data regarding population, tourism, employment and commuting underlined with data from statistical sources and surveys that have been answered by the respective project partners. In addition, the studies contain concluding remarks with recommendations if applicable. This chapter also includes information gathered from the second corresponding activity to this document, activity 3.4 (*Analysis of*

*suburban & rural connectivity patterns for public transport*). The latter also represents the sole focus of the thematic study on Viimsi, since this area was not foreseen to be part of activity 3.3.

The final chapter (see “4 Conclusions and recommendations”) represents a brief comparison between the regions highlighting their major commonalities and differences.

Results obtained by statistic data, literature review and experiences of key stakeholders indicate that the following market segments are perceived as being vital target groups to be considered for public transport service provision and planning in the project partner’s areas:

- Elderly population
- Tourists
- Commuters

All regions’ demographics are market by an increasingly aging population. According to United Nations (2019) "All 201 countries or areas with at least 90 000 inhabitants in 2019 are projected to see an increase in the proportion of persons aged 65 or over between 2019 and 2050". This recommends an even stronger focus of public transport planning on the elderly in the future ensuring the fulfilment of mobility needs of less mobile people. This includes basic transportation needs e.g. travelling for medical treatments, shopping and social events.

The development of population numbers is rather divers. Whereas the areas of the city of Rostock and its district, the Tricity in Pomorskie, Blekinge and Viimsi have been experiencing or are expecting growing or at least rather stable numbers, other regions such as Guldborgsund and Klaipeda have had shrinking population numbers. Reasons for the shrinkage have been named as being a result of high birth deficits and net migration losses. One of the strongest decreases have been observed in Klaipeda city with a shrinkage of 26 % (from approx. 204 200 in 1990 to 151 300 in 2017). This negative trend has been accompanied by economic and demographic problems with strongly diminishing proportions of younger population groups and, in particular, the highly educated. Challenges for public transport therefore arise from ensuring the provision of basic transportation needs even when shrinking population numbers reduce demand and profitability. Growing population scenarios may, on the other hand, require additional public transportation capacity to satisfy growing demands.

Tourism represents a main “reason to go” to visit a certain area. Typical for the coastal Baltic areas are, for instance, long sand beaches, islands and certain areas close to the beauty of nature with large amounts of holiday accommodation. Various attractions, such as historic city

centres, museums, theatres, zoos, hotels with spa arrangements, events, golf courses and other amenities can be very beneficial for prolonging the holiday season by attracting visitors throughout the year. All considered areas can be seen in having the touristic attractiveness in common. Depending on the frequency of tourists at certain touristic “magnets”, public transport should thus also be targeted actively at fulfilling the needs of tourists.

Particularly daily commuting is shaped by a major car-reliance in the respective regions, in particular for those who commute from/to rather rural suburban areas to/from the city centres. Whereas living conditions in suburban areas can be seen as favourable by a large stake of the population, employment rates are usually lower there and higher in urban areas / cities. This often requires commuting over larger distances with travel patterns peaking in the mornings with commutes to the working places and in the late afternoons with commutes back to the residential areas.

The high reliance on cars also arises from the fact that public transport networks especially in suburban areas tend to lack spatial density and timely frequency compared to the urban areas of cities. In fact, rural public transport is often rather concentrated on basic needs. In the examples of Guldborgsund Municipality and Rostock District the suburban public transport by buses thus mainly serves the target groups of commuting pupils or students followed by the group of people that cannot drive or do not have a car as well as by tourists.

Recommendations to curb the predominant commute by car, e.g. include tackling the behaviour of commuters and addressing improvements of public transport networks especially in suburban/rural areas.

# 1 Introduction

## 1.1 INTERCONNECT Project: Background

The European Union Strategy for the Baltic Sea Region (EUSBSR) flagship project INTERCONNECT addresses the challenge of curbing the car-reliant mobility trend in the South Baltic (SB) area through user-adjusted and more sustainable public transport services for regional and cross-border travels. The current public transport offer hardly meets customer expectations for easiness and appeal of regional and cross-border journeys, with scarce range of integrated ticket options for multimodal rides, difficult access to one-spot passenger information and no clear benefits for users when choosing the public transport over car.

The underperformance of public transport is particularly visible on ferry links where the steadily growing cross-border travels are done mostly by car – largely due to the customised services and price packages for motorised passengers. Consequently, the market segment of foot passengers on ferries is too marginal.

Public transport authorities in many SB areas have insufficient knowledge on regional and cross-border mobility needs in their communities – both now and in the future - and lack expertise of how to respond to them with sustainable solutions. The usual planning and management tools, market incentives and promotion campaigns in the regional communities to change travel behaviour tend to fail, as they are rarely based on identified no-car travel preferences.

Although many interesting public transport services/products in the SB were developed locally, the experience is very scattered, and the good practice has never been effectively exchanged at a region-to-region level. In addition, some SB areas lack regional public transport systems and the organisations to manage this process.

To enhance car-independent mobility in the SB area, the partnership, consisting of 9 formal and 10 associated project partners from 6 countries, will carry out joint capacity-building, pilot demonstration and advocacy actions. These will tackle the three dimensions of public transport in serving the regional and cross-border travels – the demand, the supply and the governance. The project will deliver innovative multi-stakeholder planning approaches for sustainable public transport of the future and invest in new and more efficient services for no-car travellers both in and between the partner areas through three thematic work packages (WPs) on:

- Evidence, knowledge and experience (WP 3),
- Steering tools and business models (WP 4) and

- Future governance and institutionalization (WP 5).

User-adjusted and more sustainable public transport services for regional and cross-border travels have a large potential to stimulate socio-economic growth in the SB area e.g. by contributing to more competitive labour markets and tourism. This potential is, however, untapped because of weak understanding of public transport impacts and lack of cross-sectoral dialogue.

Through involving a broad range of stakeholders in designing and testing the planning and management solutions that will be compatible in the cross-border context and replicable elsewhere, the project aims at increasing political and community attention for public transport role in serving mobility needs in the SB area.

Because of its flagship status, the Interconnect project's objectives, activities and outputs contribute to the EUSBSR in the specific policy area / horizontal action of achieving efficient and sustainable public transport systems in the BSR as replicable solutions are offered by providing better user access to multimodal travel information and trip planning/ticketing services as well as offering easy mobility services to regional and interregional communities. The project also provides indirect links to the policy area of Tourism and the horizontal actions of Climate (by tackling fossil fuel emissions) and Capacity (by e.g. strengthening the ability of public transport stakeholders to plan, manage and take policy decisions on sustainable services for regional and cross-border travels).

## 1.2 Purpose of the report

This report represents the third deliverable (3.3, “Market needs for regional and cross-border public transport services”) of Work Package 3 - The Collection of Evidence, Knowledge and Experience. To ensure the regional relevance in gathering the data, the HIE-RO as the leading organisation of WP 3, has involved the other project partners in, first, the development of the report’s structure and in the compilation of market needs for regional and cross-border public transport services in the partner areas and, second, the analysis of travel patterns as well as commonalities and differences in demand for public transport services.

This document is therefore designed as an input for further work and discussion within the main output of WP3 (activity 3.5) and WP4 where practical solutions are to be developed and tested in the partners’ regions. This deliverable presents the market needs for regional and cross-border public transport services the partner areas identified by means of statistical data and the project partner’s assessment. By comparing the different areas, it is also intended to outline the commonalities and differences in community demand.

The corresponding actions were performed within the activities 3.3 and 3.4, including:

- Identification of market segments (3.3)
- Analysis of public transport demand (3.3)
- Analysis of framework conditions for regional and cross-border public transport services among employers, public transport operators and public authorities in the partner regions (3.3)
- Investigation of how PT lines serve suburban/rural community needs in Blekinge, Klaipeda area, Rostock area, Viimsi (3.4)
- Preparation of 4 thematic studies with conclusions (3.4)
- Comparison of the respective PP’s areas (3.4)

The aim of analysing these topics related to public transport demand is to set an important part of the groundwork towards formulating the proposals for sustainable solutions in regional and cross-border public transport services (activity 3.5) by adding information on the market segments, demands and travel patterns. The document also aims at pointing out possible “low-hanging fruits” – feasible solutions with promising potential but rather minimal required costs and efforts that may be implemented and tested within the upcoming activities of the INTERCONNECT project.

### 1.3 Methodology used for the preparation of the report

Since this report addresses the public transport market of the specific project partners' regions, the principle of the collection of the data was to identify the market characteristics defined by the INTERCONNECT partners for the project area in terms of market segments and travel behaviour. To ensure the regional relevance in gathering the data, the HIE-RO as the leading organisation of WP 3 has involved other project partners in development of the report's structure and in presenting their area's public transport characteristics to be taken into consideration in the next analytical steps.

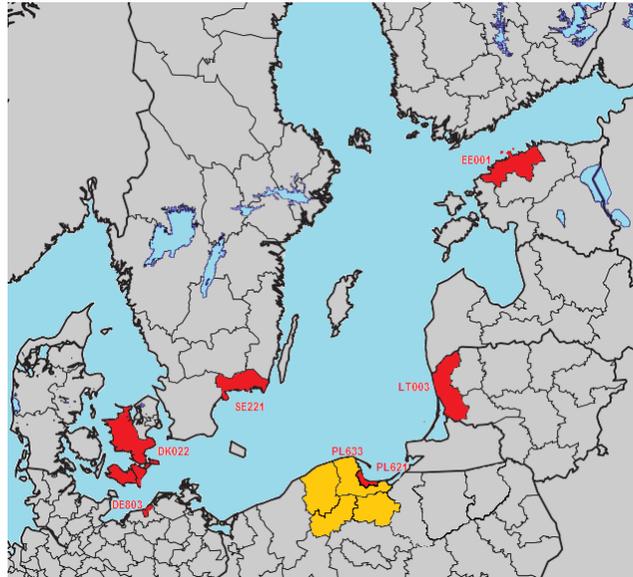
To maintain the coherent and comparable structure of the report, two surveys (addressing both: local/regional and cross-border public transport) have been developed and disseminated among project partners as a roadmap for collection of the relevant information for the report. The final survey templates versions are attached to this document.

The survey questions were formulated to:

- First, to retrieve general information on the responding organisation (questions A-C),
- Second, to clarify topics related to activity 3.3 (mainly questions D - H):
  - **Activity 3.3: Investigation of market needs for regional and cross-border public transport services**  
Description: Identify market segments in 5 SB partner areas of interest for the no-car travel option; Research their 'reasons to go'; Analyse framework conditions for regional and cross-border PT services among target groups in the partner areas; Compile information and compare needs among 5 partner areas,
- Third, to clarify topics related to activity 3.4 (mainly questions I - L):
  - **Activity 3.4: Analysis of suburban & rural connectivity patterns for public transport**  
Description: Investigate how PT lines serve suburban/rural community needs in Blekinge, Klaipeda area, Rostock area, Viimsi; Arrange meetings with relevant actors to identify the demand; Prepare 4 thematic studies with conclusions; Compare them among the involved PPs

The geographic area of interest is oriented on both the project partner structure on INTERCONNECT as well as the South Baltic Programme area. It therefore includes areas of 5 different countries: Germany, Denmark, Sweden, Poland and Lithuania (Figure 1). Additionally,

Estonia, respectively the municipality of Vimsii, has partly been subject of analysis within activity 3.4.



**Figure 1: Geographic Area of Interest - INTERCONNECT project, NUTS3 region codes**

This report is structured into 3 broader sections. The first represents a literature review to introduce the reader to the topics of the public transport market and its major segments including commuting, tourism and elderly people. The second section is about the empirical data gathered by the project partners involved in the survey. The third section aims at concluding the two preceding sections by outlining commonalities and differences as well as by formulating recommendations.

## 2 Market Segmentation and examples regarding public transport

Market segmentation is a concept in marketing research where the market is divided into different identifiable customer groups with specific characteristics that make them distinguishable from other groups. The division of population groups can be made by different characteristics, e.g. specific tastes, preferences or behaviours which may be relevant for the success of a product or service (Bamford et al. 1987) (Pas & Huber 1992) (Sullivan & O'Fallon 2008).

In fact, Sullivan & O'Fallon (2008: 2) emphasise that market segmentation is to be used as a means of certain practical goals, i.e. "by tailoring interventions or communications to fit target audiences better." Also, the "80-20"-rule is prevalent. Market segmentation may thus help to identify the "20%" customer group that account for "80%" of the sales. The way of segmenting a market depends, however, on the perspective of the market researcher, since there are many possibilities with different characteristics and data types (quantitative and qualitative) to take into consideration. For instance, the segmentation can be done market-defined ('post hoc') or pre-determined ('a priori') with taking various bases into account (Sullivan & O'Fallon 2008: 3 / Bramford 1987: 26-27):

- **Geographic** (e.g. region, city size, area of residence, population density),
- **Demographic** / socio-economic variables (e.g. age, gender, income, car ownership),
- **Behavioural** (e.g. regular, occasional, non-user of public transport),
- **Psychographic** such as attitudes, values, lifestyles (activities, interests, opinions), personality,
- **Benefits** (e.g. costs and benefits of changing to a different mode of transport).

Regarding the travel itself, specific factors can be used to further segment the market, such as:

- **Trip purpose** (e.g. work, education, business, leisure) (Bramford 1987),
- **Travel mode** (Cameron 2002),
- **Travel frequency** (Sullivan & O'Fallon 2008: 3),
- **Ticket type** (Bramford 1987).

Better understanding and segmenting the market from the customer's behavioural side can help to optimise expenditure targeted at making public transport more attractive. In fact, Cameron (2002: 2) has, for example, identified six different groups of customer types, which are:

- **Strider customers** (*prefer to walk or cycle*),
- **Stranded customers** (*no affordable transport available*),
- **Survival customers** (*captive to the cheapest mode of public transport*),

- **Sensitive customers** (captive to the best option of public transport),
- **Selective customers** (can afford a car but willing to use public transport),
- **Stubborn customers** (will only use car).

Sullivan & O'Fallon (2008), for instance, rather focussed market segmentation on the customer's interest in using public transport by dividing the customer group into 3 different groups:

- **Interested** (i.e. not currently using sustainable modes on a regular basis but expressed an interest in receiving information about them),
- **Regular** (i.e. already regular users of sustainable modes), some of whom still might want extra information,
- **Not Interested** (i.e. did not require any information about sustainable modes) (Sullivan 2009).

Segmentation of customer groups can also be done regarding different preferred travel modes or available travel options in a certain area. These can e.g. include going by:

- **Foot**
- **Bicycle**
- **Car**
- **Bus**
- **Train**
- **Plane**
- **Ferry**

In order to influence the use of public transport, it can be helpful to identify the “low-hanging fruits.” According to Laconte (2002: 10), “The easiest market segment to grow is the one that requires raised consumer awareness through marketing focused on individuals in areas served by the transport.” In fact, to use public transport, convincing occasional passengers is much less difficult than persuading non-users. Another “low-hanging fruit” can be the market of customers that feel discouraged using public transport due to the complexity of ticket fares, especially when different transport systems are involved. This group of potential customers is particularly represented by tourists (Laconte 2002).

Another market potential can be represented by users that prefer pre-trip information for multimodal or multi-operator trips. Improved information systems may thus help. There may also be potential users that are reluctant to change transport modes during their trip. This has, for instance, been tackled in the public transport system of the German city of Karlsruhe, where freight-train tracks have been utilized for public transport vehicles in order to reduce interchanges (Laconte 2002).

Combining single lines to a network may also enhance usability in the perception of the customer. Combining 2 underused lines to form a north-south connection within the example of Manchester in combination with an easy-to-use travel card has drastically increased the amount of public transport users (Laconte 2002).

Niche market segments where the use of public transport can be encouraged may be Airport links, access to leisure parks and mass events such as popular sport events (Laconte 2002).

The best measurement, however, to regain market share of public transport, is the implementation of land-use policies that favour public transport. Laconte (2002: 11) states, that “Operators usually have little say on land-use policies but should know that major successes have been achieved by cooperation with authorities. Working on their own, transport operators can gain small market segments but working with city authorities offers the potential for much larger gains.”

A further insight on the perception on transport to improve its use has been given by Lyons (2004: 485) who stated that “transport does not merely serve society: it shapes society, as in turn society shapes transport. The future of each is dependent on the other, and this fact must be recognized.” According to Shergold, Lyons and Hubers (2015: 92), the logic behind that is generally to research and forecast travel demand in order to create policies and investments to serve societal requirements. This, however, “overlooks the fact that in practice transport shapes society — where people live, and work and forms of social practice and economic activity are influenced by transport availability.” Hence, future developments of public transport may not uniquely depend on societal trends but also influence the society’s future.

In the following chapters, theoretical input is given to the public transport market segments of tourists, commuters and elderly. As confirmed in the thematic study by statistical data and experience, these market segments are indeed perceived as being vital target groups for public transport services in the project partner’s areas.

## 2.1 Tourism and public transport

Transport is an essential part of tourism. Without transport it would not be possible to leave the home environment and to become a tourist (Hall & Le Klähn & Ram 2017). In fact, “transportation plays a very important role in the development of tourism and the economy as a whole” as Truonga & Shimizub (2016: 3106) state. Particularly the role of urban tourism has been growing in cities, which is a result of e.g. increasing prosperity and improvements of the mobility of people (Lapko 2014: 207).

Albalate & Bel (2010: 425) also emphasise the contribution of tourism to social and economic development. Tourism is seen as a factor to increase demand for urban transportation. In reference to urban areas, the authors, however, note that cities often do not respond sufficiently to tourism by increasing their services; tourism is rather seen as a “positive externality on public transport, since it provides additional funding for these services, but it also imposes external costs on resident users because of the congestion caused by supply constraints” (Albalate & Bel 2010: 425). Referring to supply decisions, Albalate & Bel (2010: 432) mention that tourism has not been considered sufficiently. Travelling tourists rather represented an incentive “as a revenue-increasing factor that helps to fund the transportation systems.”

Also, the fact that tourists are mostly not eligible for the discounts that local PT users can get, the additional demand can help subsidising the PT system, particularly in off-peak periods by increasing the occupancy rate and thus improving the cost-benefit ratio of operating the PT vehicles, especially when local demand is lower during weekends and holiday periods “when local residents make less use of public transportation; the main reason for residents’ trips is work related travel, and this need is much higher on weekdays during non-vacation seasons” (Albalate & Bel 2010: 432).

A major impact of tourism is its influence on the city’s functioning: “High volume of tourist traffic can also cause degradation of tourist values, thereby reducing - in the long term - the tourist attractiveness of the place” as Lapko (2014: 207) notes. Albalate & Bel (2010) refer to this as *negative external costs* caused by tourists travelling in peak time periods. Additional demand from tourists can influence commuting of local citizens with increased congestion and less comfort. Nonetheless, tourism represents an opportunity that authorities should take advantage of: “This foreign cross-subsidy allows city planners to reduce the average charges to local users (or alternatively reduce budget subsidies to the transportation system)” (Albalate & Bel 2010: 432). Another main impact of tourism can be found on the environmental side. According to

Cohen (et al 2014: 3-4), around 72 % tourism-related greenhouse gas (GHG) emissions are related to transport and it can be observed that overall GHG emission of tourism is still growing. This is also the case for the average distance per trip which has been growing faster than the increasing number of trips in recent years. Tourism growth scenarios are thus not compatible with efforts in reducing the environmental impact of travelling. The major GHG emittance is caused by flying (75 %). A behavioural shift towards less flying combined with a modal shift to e.g. buses and trains for (cross-border) travels may hence represent a major potential for GHG reduction.

At key destinations, however, public transport plays a vital role in moving tourists around during their stay (Hall & Le Klähn & Ram 2017). Regarding the motivation for using public transport, Le-Klähn & Gerike & Hall (2014) focus on the different characteristics between users and non-users of public transport, in terms of demographics, travel profiles and attitudes. The authors found out that tourists mostly use public transport because of drive-free benefits, traffic and parking related issues, the availability of local public transport and the unavailability of a car. However, many people often feel discouraged to use public transport because of e.g. perceived inconveniences and restrictions, a lack of information, disadvantages accompanied using PT and personal preferences. The most important variables that, on average, differentiate users of public transport from non-users have been stated by Le-Klähn & Gerike & Hall (2014: 158) in their case study on Munich as follows:

- *length of stay,*
- *main purpose of the trip,*
- *age group,*
- *frequency of public transport use at place of residence, and*
- *valid driving license ownership.*

To encourage an increased use of public transport services, Le-Klähn & Gerike & Hall (2014) highlight the importance of proper information provision to the tourists. Visitors should in particular be able to recognise the advantages of PT before arrival. The authors therefore suggest destination marketing that includes the promotion of the local public transport. Proper social marketing could then, for instance, influence behavioural change towards using more PT in the pre-trip decision stages. A “low-hanging fruit” in urban areas may for instance be the targeting of younger tourists on their holiday travel with one-day-stays coming to the city for the first time.

Besides measurements such as communication and social marketing (Gronau 2017), introducing a Guest-Ticket concept can help to further attract tourists as public transport users. The latter has indeed been a trend in Germany. These so called “Gäste Tickets” can offers tourists unlimited use of public transport on different modes within defined areas throughout their vacation. In their publication, Le-Klähn & Hall (2014) further discuss the different approaches to design, implement and administer such a tourist ticket.

Another approach particularly targeted at city residents has been introduced by the Countryside Agency in the UK with a multi-modal ticket called Wayfarer. The aim of this ticket was to encourage visiting the countryside by using public transportation. This has proven to be successful: 20 years later this ticket is still in use for more sustainably travelling for leisure (Lumsdon & Downward & Rhoden 2006).

The provision of information is an important factor attracting tourists to public transport. Garcia (et al. 2013) has for instance examined the use and potential of personalised electronic tourist guides (PETs) for travel information and he concluded that “transportation information has been identified as one of the most appreciated functionalities of a PET.” (Garcia et al. 2013: 758) The algorithms analysed by the authors where able to generate and propose routes with points of interests matching the preferences of the tourist including real time travel data from public transport. Implementing these algorithms in real mobile devices may thus represent a potential for enhanced public transport use by tourists (Garcia et al. 2013: 773).

Public transport should also be easily accessible and not difficult to use for tourists. Bus stops and train stations should be situated in proper locations that allow the PT-users convenient access (Le-Klähn & Gerike & Hall 2014). As Thompson & Schofield (2007) concluded, public transport’s ease of use also influences destination satisfaction much more than e.g. safety and efficiency.

## 2.2 Commuting and public transport

Journey decision between the use of cars and public transport are not only solely based on utility factors such as cost, reliability and travel time. As Mann & Abraham (2006: 155) point out in their study on commuting, journey decisions of car drivers are rather based on affects influencing their behaviour. The authors have identified four domains of affects: “journey-based affect (JBA), personal space, autonomy and identity”. **Journey-based affects** describe “the positive or negative feelings experienced during the journey, such as comfort, enjoyment and stress” (Mann & Abraham 2006: 162). **Personal space** can be an aspect of JBA discouraging the use of public transport meaning “time alone without intrusions” as well as “the feeling of ownership of space” (Mann & Abraham 2006: 164). **Autonomy** describes feelings of freedom and refers to the notion of being in control. This is particularly valued by car driving commuters since they feel in control of their journey with the ability to choose specifics of their journey (Mann & Abraham 2006: 166). The combination of **car ownership** with **identity** represents an important characteristic of car-driver’s perceptions since cars often mean an essential part of everyday functioning and the person’s own perceived value (Mann & Abraham 2006: 168).

The roles these affects play can however be of different importance: whether they affect the modal choice or not depends on the participants’ circumstances and own assessments. In fact, “certain considerations were of paramount importance to particular drivers: sometimes, affective considerations were primary to decision making and, sometimes, utility considerations, such as time, took priority” (Mann & Abraham 2006: 171).

Perceptions, such as a more pleasant commute, more personal space, more autonomy or identification with a certain type of car have therefore convinced commuters in Mann’s & Abraham’s research (2006: 171) to not use public transport.

The so called “low-hanging fruits” of actions that can be undertaken to enhance the use of public transport may be derived from the importance of affective decisions of many car drivers. For instance, as Mann & Abraham (2006: 171) point out: “Time efficiency is crucial to public transport use but providing a more pleasant travel environment may reduce the need for public transport to be more time efficient than driving.” Promotional activities for public transport tackling the behavioural side of affective decision-making may thus represent measurements to achieve considerably enhanced use of public transport at lower costs than pure infrastructural improvements.

Another view on commuting can be obtained by looking at the urban structure of a city. Because of urban growth, Gordon & Kumar & Richardson (1986: 138) state that polycentric metropolitan regions were on the rise due to, amongst other things, increasing congestion near the central business districts and “the exhaustion of CBD agglomeration economies”. According to the authors, polycentric urban regions usually imply shorter commutes since households can choose their place of residents in housing areas around their employers to minimize commuting journeys.

However, the reality consists of different economic sectors and residential areas that are not uniformly dispersed. Commuters may thus travel across larger areas with longer instead of shorter journeys (Gordon & Kumar & Richardson 1986: 138).

## **Stress**

An important psychological factor referring to commuting is stress. In their study on stressed commuters, Cantwell & Caulfield & O’Mahony (2009: 18) found out that the characteristics of the respondent’s commute correlated significantly with commuting stress. The more crowded the commuting experience by public transport is, the more likely commuting stress will occur. Reasons for that may be less personal space and unpleasant and cramped conditions. An additional negative influence on stress levels is the reliability of public transport services, “most likely induced by a lack of control over the situation.” In fact, longer waiting times combined with the commuter’s sense of lack of control of the situation can notably increase stress levels – and even more the longer the services were behind schedule. Improving PT services to reduce crowding as well as waiting times may thus represent a “low-hanging fruit” to increase the commuter’s satisfaction regarding the use of public transport (Cantwell & Caulfield & O’Mahony 2009).

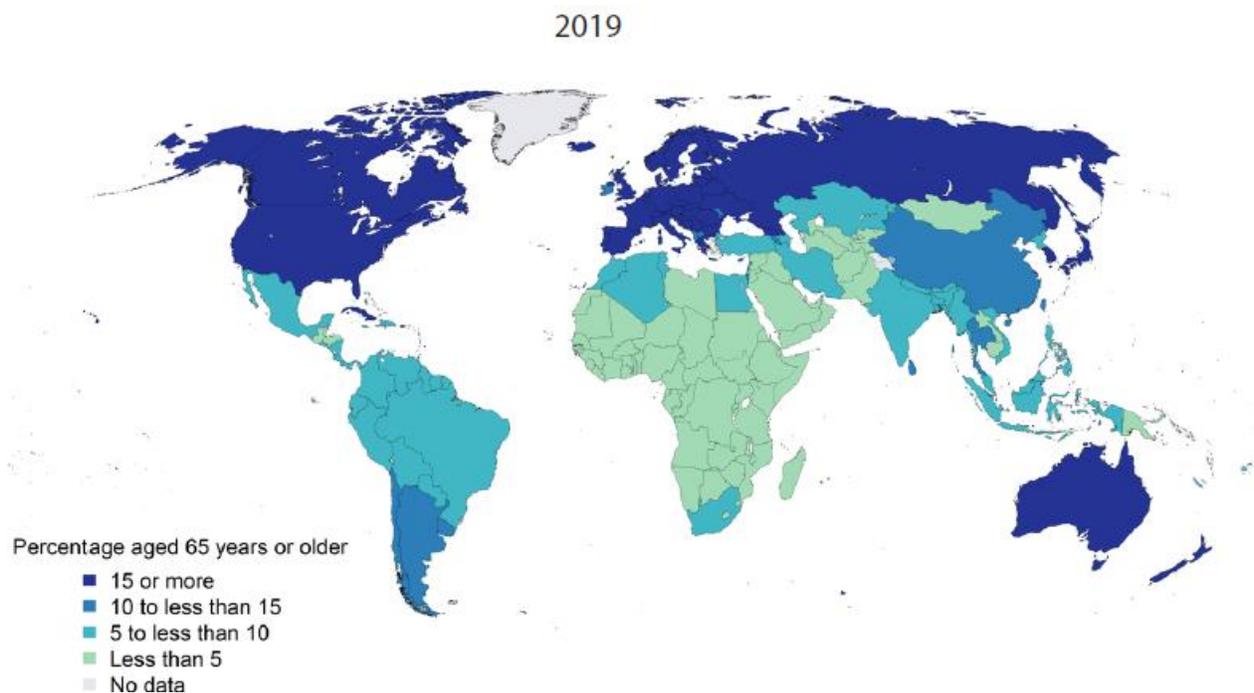
## **Physical activity**

Another relation of public transport to health has been found by Lachapelle et al. (2011). The authors note that most public transit commuters perform more moderate physical activity than non-users, since distances to and from public transportation involve physical activities such as walking. It was concluded that “Investments in infrastructure and service to promote commuting by transit could contribute to increased physical activity and improved health” (Lachapelle et al. 2011: 72).

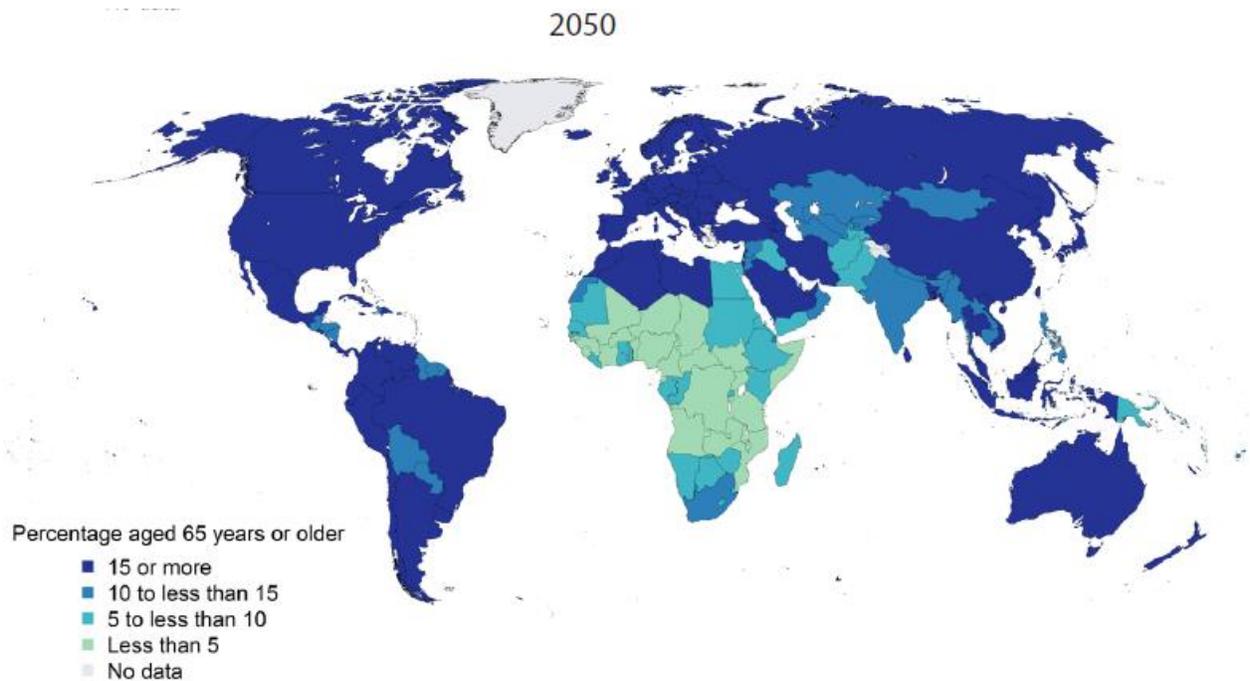
### 2.3 Elderly and public transport

We are living in a time where the demographic pyramid is changing its shape. Because of lower birth rates, improvements of medicine and technology as well as the ageing of the baby-boom generation, the elderly population is growing significantly. This is representing a major challenge in many countries. To integrate every citizen in society and to maintain a high quality of life, equal access to vital infrastructure must be ensured by appropriate adaptations of transport related policies and the elimination of mobility and accessibility barriers (Aguiar & Macário 2017: 4367).

Europe’s population ranks, as a matter of fact, among the oldest globally (Figure 2 and Figure 3). As described by the United Nations (2019), “historically low levels of fertility combined with increased longevity ensure that populations in virtually all countries and areas are growing older”.



**Figure 2: Percentage of population aged 65 years or older in 2019 (United Nations 2019)**



**Figure 3: Percentage of population aged 65 years or older in 2050 (United Nations 2019)**

One of the most essential parts of being mobile is public transport, especially for people whose access to cars is limited or not existent. Besides underage persons this is particularly the case for elderly people (Simpson 1994; Rahman et al. 2016). In fact, Hensher (2006) describes that besides losing a partner, the loss of a driver's license can potentially be the main factors leading to social isolation. Adequate and flexible public transport services thus need to be available for older people.

Wong et al. (2017 a: 209) note that the rapidly growing elderly population may cause serious issues with public transportation access when the individual's mobility is limited due to age and health related constraints. Public transport services must thus be adjusted to the needs of elderly to ensure their quality of live. As the authors found out in their case study on Hong Kong, particularly two service aspects of public transport have a lot of influence on the satisfaction of elderly people regarding public transport. The aspect that the elderly recognised as the worst performed service in Hong Kong adding to dissatisfaction was seat availability. And the most influential aspect on overall public transport service satisfaction was the condition of stops and stations. Knowing which aspects to prioritise may help to increase satisfaction and thus increase the use of public transport by meeting adjusting to and focusing on the needs of elderly. Therefore, as the authors conclude, public transport drivers should be appropriately trained and

guided to make them aware of the influence of their driving behaviour and their attitude; and to pay attention to the provision of seats particularly at bus stops that are frequented more often by elderly. In addition, the offering of seats to elderly people could become a culture that is to be promoted through continuous education. Hence, improved PT services may increase the elderly's mobility and their ability to participate in different social activities (Wong et al. 2017 a: 209).

The latter issues also refers to Svensson's (2003) research where the following factors have been analysed with a focus on older people: "walking distance, travel time, headway, transfer, waiting time at transfers, booking, booking time, get seated, vehicle type, travel alone." The author concluded that the "overall pattern was that those with low physical capacity had higher valuations for most of the factors." Among these factors, walking distances have proven to be particularly important for groups with limited physical capacity whereas avoiding the booking of tickets was rather the concern of people with higher physical capacity. The aspects of getting seated before driving starts as well as the vehicle types have also been evaluated as being important for elderly (Svensson 2003).

There also seems to be a major focus on money in public transport policy by, for instance, providing certain fare schemes for the elderly. Wong et al. (2017 b: 73) criticise this emphasis on money to determine the willingness to travel by pointing out that other factors, "such as walking distance to and from stops and stations, wait times for public transport services, and seat availability, have not been considered by transport operators and policy makers" in their case study of Hong Kong. Research in other regions may thus reveal possible "low hanging fruits" with improvement potential that are different unlike the financial aspect.

Referring to walking distances to access public transport, Fatima et al. (2018) note that "the most common complaint from those aged 65 and over was that public transport is not convenient and does not go where they want." In fact, the authors name accessibility as "a measure to identify transport service quality." Proximity to public transport is therefore particularly important for the elderly (MURRAY 1998: 327). Careful public transport planning may thus be necessary with a focus on minimising walking distances from residential neighbourhoods to suit the elderly's needs.

In fact, accessibility has also been a major topic in the research of Bajada & Mifsud & Di Ciommo (2016: 72) on public transport use of elderly people. According to the authors, inequities in public transport can cause the formation of transport-disadvantaged groups, such as disabled,

low-income and elderly people. The latter is specifically dependent on public transport since age and health related circumstances may not be suitable anymore for e.g. driving a car. Accessible public transport is thus necessary to ensure the mobility of the elderly. To improve the conditions for elderly and to provide transport equity (meaning equal access to public transport services), the authors have looked at three different aspects of accessibility in their case study of Malta: “road infrastructure, public transport infrastructure, and the bus fleet.” Road infrastructure, referred to as “accessibility at the macro scale” may include the conditions of pavements and their suitability for bus services whereas by the mesoscale the authors refer to “accessibility of infrastructure in physical and cyber form, such as access to and on bus stops and access to online travel information.” The accessibility at the micro scale refers to the public transport vehicles including the condition for boarding, disembarking riding in the vehicle (Bajada & Mifsud & Di Ciommo 2016: 72).

Besides being compromised in taking part in social activities, a lack of mobility can also negatively influence the access to health care – which is of crucial importance for the aging population particularly for rather vulnerable groups such as the elderly. According to Higgs (2017) few studies have yet explored healthcare accessibility by different modes. To avoid potential inequalities in the accessibility of health care it would be necessary to also focus on measures of accessibility to understand the public transport service supply compared to the demands of the elderly (Higgs 2017: 143).

Access to markets and shopping opportunities necessary for proper nutrition of elderly represents another topic where public transport can play an important role. Besides a lower income, a lack of markets in the neighbourhood and the unavailability of a car, also a lack of access to public transportation can have significant negative effects on elderly and their well-being especially in remote rural regions (Donini et al. 2012: 9). Hence, a well-developed system of public transport adjusted to the needs of elderly may also be a small contribution to reducing the functional, economic or social risk factors for malnutrition.

The authors Aguiar & Macário (2017: 4367) furthermore point out the behavioural dimension: “The system can be one hundred percent ready for all senescence limitations of the elder, but this does not mean that they will use it.” Besides focussing on designing the perfect system, the confrontation of the elderly with the system including adapting to a new lifestyle should not be neglected. In fact, being faced to change habits may cause resistance as it is the case with any forced changes in life. The authors therefore do not propose to focus a system’s configuration on a certain life stage exclusively. Instead, to avoid forced changes between different age groups,

the authors advocate the development of a universal, accessible system of transport. They thus note: “We cannot be waiting for the individual get old to use what was designed for him. Avoiding this it will be possible to promote a fluid life pattern regarding the transport system, making it a multigenerational universal transport” (Aguar & Macário 2017: 4367).

The aging society will significantly impact travel patterns and mobility behaviour of the elderly. As Shergold and Lyons and Hubers mentioned in 2015, individual (car) traffic will remain important, especially ageing people living alone in their own home. In fact, the stake of elderly possessing a driver's license with access to private cars is growing. Also, the number of elderly living in rural and suburban areas is forecasted to represent a substantial number since many younger families contributed to the suburbanisation trend in the sixties. Because the availability of public transport is rather low in rural regions, elderly keep on being car-dependent especially when in need to visit urban areas such as for communal institutions or other purposes. Since navigating through traffic in urban areas is more demanding and particularly for elderly challenging, Schlag and Schwenkhagen and Trankle (1996: 75) suggest a new system design that e.g. represents “a combination of private car - to approach an urban area - and public transport - to reach the city centre”.

Travel patterns may vary for elderly living in communal facilities; joint travels may then become more important. Living forms, such as co-housing may lead to higher degrees of “companionship and ‘inclusion’, as well as financial benefits for older people” including elements such as shared ownership and use of vehicles (Shergold and Lyons and Hubers 2015: 91). The opportunities for public transport services may arise from adjusting to new, re-localised travel patterns to where the elderly live as well as by incorporating information and communication technology to planning and meeting travel demands. Also, the kind of travel is different with the elderly. Whereas, public transport was, for example, mainly used for commuting, it might be rather necessary to serve leisure as well as health care related travel purposes. New technology, such as IT, may furthermore reduce the need for travel when the physical presence is required less due to e.g. remote health monitoring and online social networks. For that matter, Shergold and Lyons and Hubers (2015: 92) pick up on other authors describing that a fundamental change from an automobile centred to a digital society is happening with less importance for car-ownership.

### 3 Thematic studies

This paragraph is about describing the region of analysis, namely Rostock and Mecklenburg-Western Pomerania (Germany), Guldborgsund Municipality (Denmark), Blekinge Province (Sweden), Pomorskie Voivodeship (Poland), Klaipeda (Lithuania) and Viimsi (Estonia). The first five areas have been described by providing general (geographic) information, information on public transport, population, tourism and employment including commuting in order to gain insights on the main market segments relevant for public transport, the “no-car-travel-option”, the “reasons to go” as well as the demand and needs for public transport (based on activity 3.3). The thematic studies as well as the main focus of the Viimsi study include information on how PT lines serve suburban/rural community needs. For that matter, experts of main public transport stakeholders were consulted to identify the demand for public transport services (based on activity 3.4).

### 3.1 Rostock / Mecklenburg-Western Pomerania (Germany)

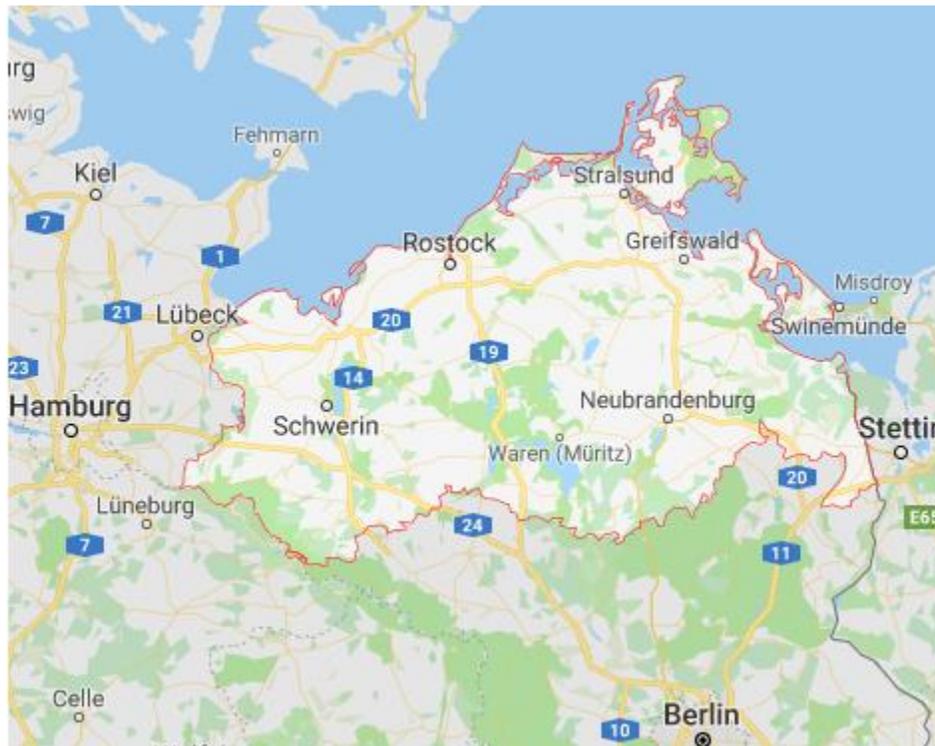


Figure 4: Google Maps (2019): Mecklenburg-Western Pomerania [<http://maps.google.com/maps>; 2019-04-12]

Mecklenburg-Western Pomerania (MWP) is one of the 16 federal states of Germany; it is situated in the north east of Germany sharing borders with Poland, the German federal states of Brandenburg, Sachsen-Anhalt and Schleswig Holstein. MWP's outer coastline with the Baltic Sea is approximately 377 km long. Including bays and lagoons, the total length of the coastline amounts to 1945 km, the longest of Germany's federal states (Ministerium für Landwirtschaft, Umwelt und Verbraucherschutz Mecklenburg-Western Pomerania 2010). MWP is inhabited by around 1.6 Mio people, in an area of 23293.31 km<sup>2</sup> (Statistisches Amt Mecklenburg-Vorpommern 2018).

The Hanseatic city of Rostock represents MWP's largest city of 208.000 inhabitants on 181 km<sup>2</sup>. The population of its surrounding district (District Rostock) amounts to almost 215.000 on a surface area of 3431 km<sup>2</sup> (Statistisches Amt Mecklenburg-Vorpommern 2018). It is expected that Rostock's population will increase to about 230.000 by 2030 (Bleis 2015).



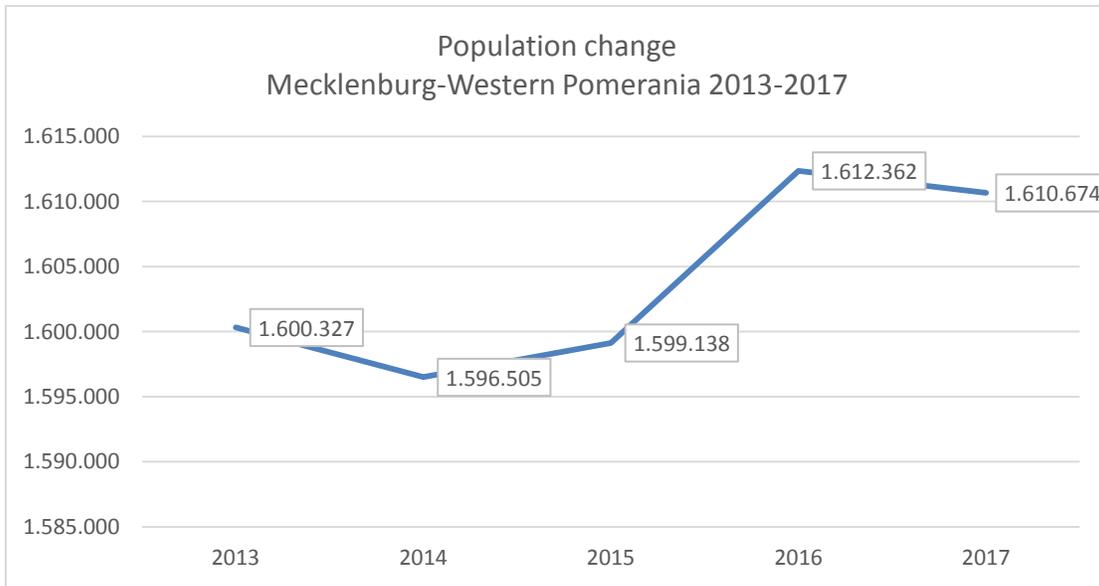
**Figure 5: Rostock, district and city area (NDR)**

Not only in terms of the number of citizens but also economically, Rostock is the strongest city in the federal state. Besides ship building and shipping, the city has a dominating tourism and service sector available (Ministerium für Wirtschaft, Arbeit und Tourismus 2008).

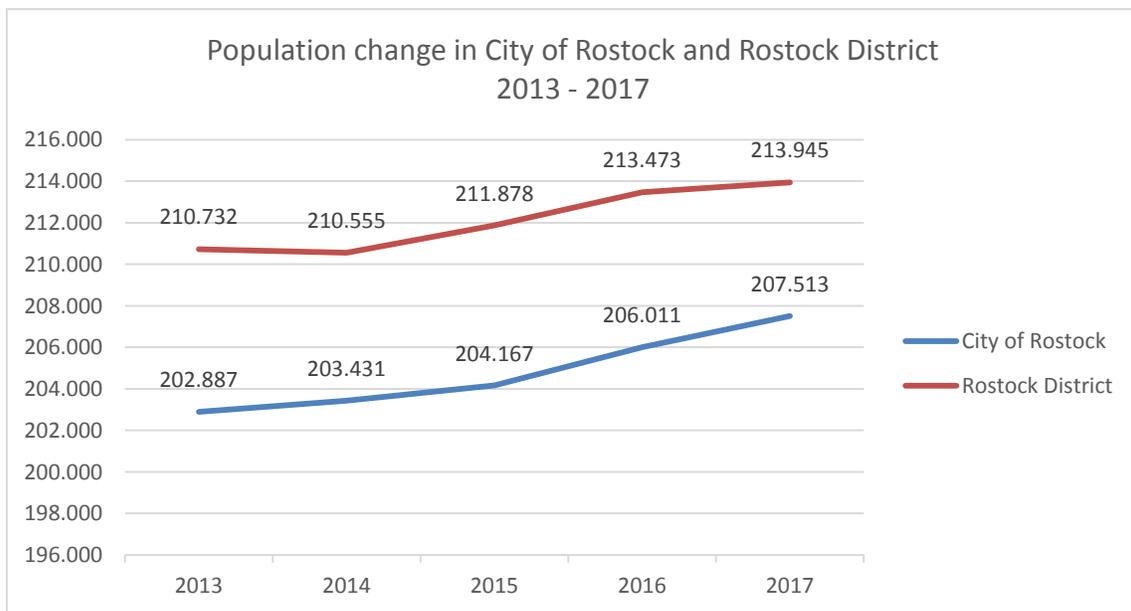
Transport-wise the city allocates Germany's largest Baltic Sea port with a cargo handling of 28.8 million tons in 2017. Major cross-border passenger transport by ferry amounts to a maximum number of 17 departures per day to either Gedser (Southern Denmark) or Trelleborg (Southern Sweden) conducted by the ferry companies Scandlines, TT-Line and Stena Line. In 2017, 5281 arrivals and departures of ferries carried 2.2 Mio passengers between Scandinavia and Rostock. The sea port of Rostock also represents an important node in Trans-European Transport Networks (TEN-T). Another element of cross-border passenger transport is the city's regional airport Rostock–Laage with about 290,000 passengers handled in 2017 to and from destinations such as Munich and Southern Europe (Jagiello & Wojtach & Łuczak 2018: 31).

### 3.1.1 Population

According to recent data covering the years 2013 – 2017, MWP's population oscillates around a number of 1.6 Mio with a slight increase on average (Figure 6). This is consistent with the state's largest city, Rostock, where the population slightly increased by almost 2% over the same period (Figure 7). The slight increase in population in MWP is mostly resulting from a net migration gain.



**Figure 6: Population Mecklenburg-Western Pomerania 2013-2017 (Eurostat, 2018)**



**Figure 7: Population change Rostock 2013-2017 (Eurostat, 2018)**

Since the population density is about 65 inhabitants per km<sup>2</sup>, MWP represents the least densely populated federal state of Germany (Statistisches Amt Mecklenburg-Vorpommern 2018).

A major challenge for the future arises from the aging population. Current figures indicate that the stake of elderly citizens is forecasted to rise significantly in the future (Figure 8 and Figure 9).

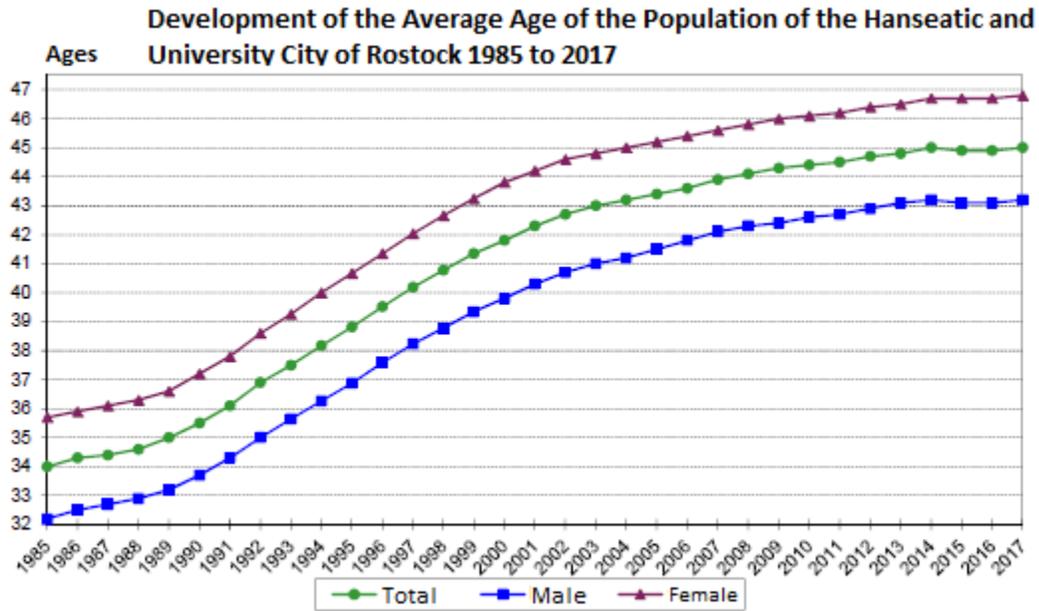
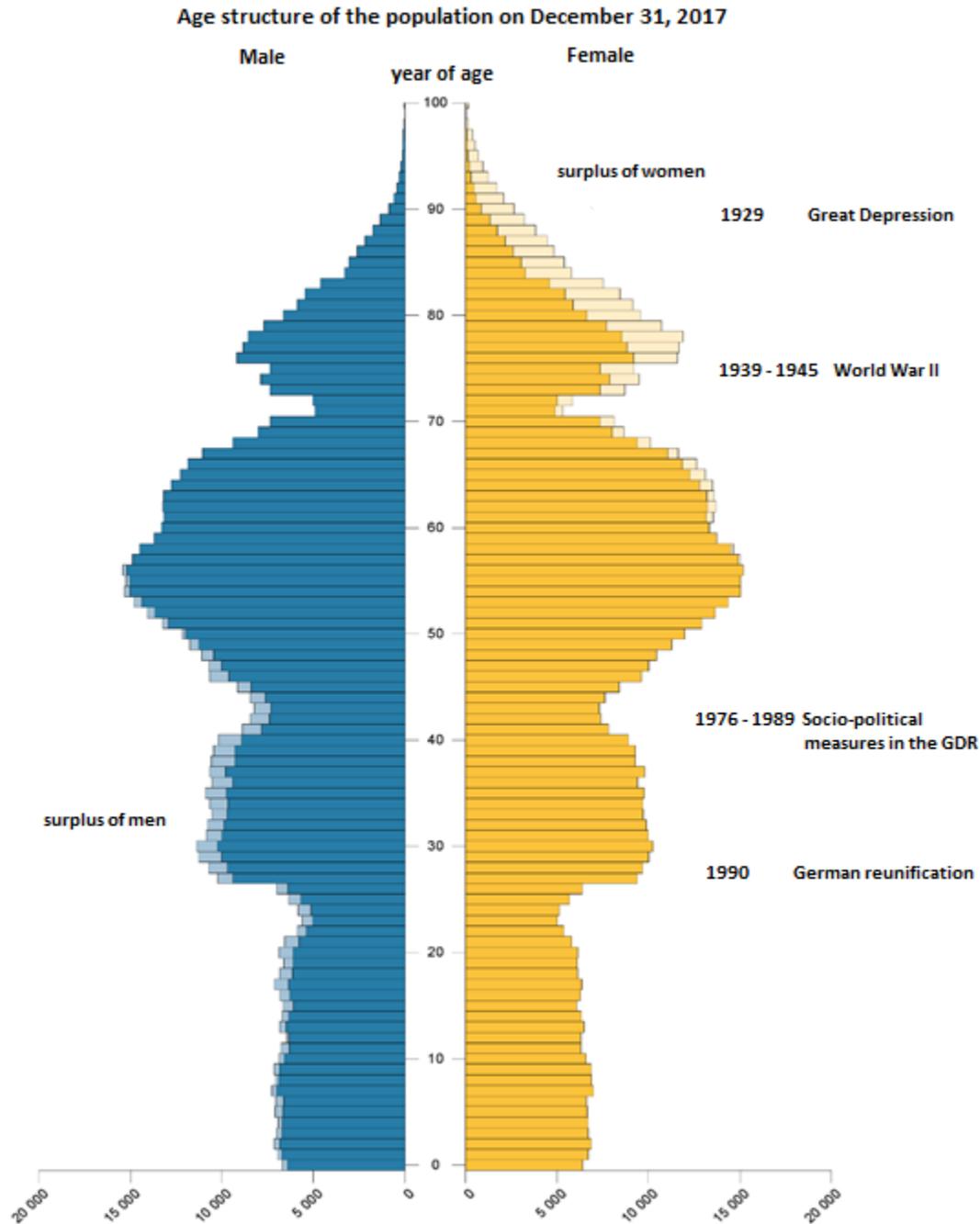


Figure 8: Rostock City, average age development 1985-2017 (Hanse- und Universitätsstadt Rostock 2018 a: 49)



**Figure 9: Population and age distribution MWP (Statistisches Mecklenburg-Vorpommern 2018)**

A continuation of the aging population trend may represent various challenges regarding the provision of public transport in Rostock and its surrounding District. Dependency on public transport may rise i.e. due to the loss of driving licence / car ownership while living longer with rising life expectancy in the future.

Another challenge is created by the forecast of population growth. Over the coming years, Rostock will have a rising number of inhabitants leading to an increase in demand for living space (Rostock Business 2013). Therefore, measures have been undertaken to ensure that new housing capacity will have appropriate connections to transport infrastructure, to public transport.

The pattern of population development since the early 2000s in and around Rostock shows significant population gains in certain suburbs such as Kritzmow, Roggentin and Rövershagen (Figure 10). This might have caused additional commuting, particularly if these people work or use infrastructure in the city. Population gains are partially caused by the natural population development (ratio of births to deaths) and migratory movements (ratio of migration to emigration).

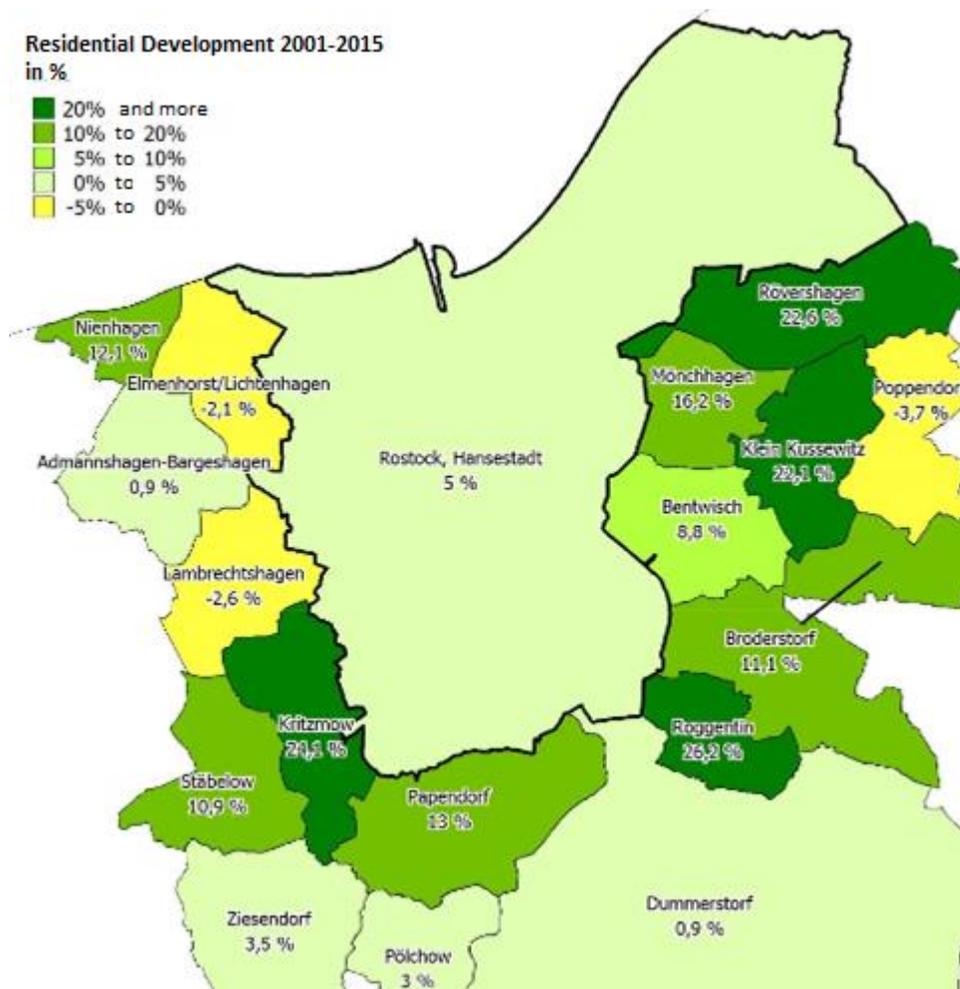


Figure 10: Population development Rostock and Suburban area 2001-2015

Different forecasts, however, show various scenarios regarding possible population development figures. For instance, the German Economic Institute forecasts a shrinking population by 4.8 % by 2035 for the federal state Mecklenburg-Western Pomerania (Deschermeier 2017). For the District Rostock, numbers are expected to decrease by around 6 % by 2030 – as the combined average of the natural and realistic-scenario-estimations indicate (Planungsverband Rostock 2017: 238-240). The city of Rostock, on the contrary, sees a future population decrease first and foremost in remote/rural areas since, according to calculations in 2016, it expects the city to grow from around 206 000 in 2015 up to 230 000 by 2035. This would mean a relative growth by more than 11 % in the 20 years after 2015 (Hansestadt Rostock 2016).

Focussing on the suburban areas closest to Rostock, current forecasts also predict a further population growth but with lower intensity. A calculation taking a “natural” as well as “realistic” scenario into account reveals an expected growth of inhabitant by almost 3 % by 2030 (Planungsverband 2016: 22-27).

### 3.1.2 Tourism

The transport infrastructure of the Rostock area offers several possibilities of accessing and exploring the city and its surrounding communes such as by car via the highways 19 (north-south) and 20 (east-west) as well as by the direct railway connections to Hamburg and Berlin. The national and international accessibility of the region is complemented by one of Germany's most important Baltic Sea ports including its cruise ship port from which passengers can start their day trips and shore excursions such as to Berlin. Tourists coming by plane may find a few connections to the regional airport of Rostock-Laage. A car-free exploration of Rostock (i.e. Figure 11) and District Rostock is also possible by its public transport network, consisting of trams, regional and suburban trains, as well as buses and ferries. The rather dense network of cycling and hiking trails also attracts tourists (Planungsverband 2019).



**Figure 11: In the city centre of Rostock - a major tourist destination in MV (by Andrea Anastasakis on Unsplash)**

Per year an estimated number of around 1.7 million tourists travel the Rostock region with destinations such as the coast with its numerous sandy beaches (Figure 12) and coastal settlements as well as the nature and sights of the countryside. Tourism infrastructure has

therefore been extensively developed and modernised - contributing to the region's attractiveness. For example, the new marinas of Kühlungsborn and Rostock / Hohe Düne as well as reconstructed coastal villages and manor houses in the countryside are important elements to enchant tourists. Another main pillar of attracting tourists is the organisation of regular events such as the Hanse Sail and the Warnemünder Woche. Other regular (cultural) events include concerts in the Doberan Minster, theatre performances in Güstrow or the Christmas market in Rostock. Particularly the larger of these events are not only a highlight for the local population but a magnet for visitors from all over Germany and Scandinavia. The Rostock area is also working on further promoting the region as a conference region by applying the slogan „seaside conferencing.“ Business travellers may be able to combine the organisation of successful conferences with enjoying the charms of the local nature (Planungsverband 2019).



**Figure 12: The white sand beach of Rostock-Warnemünde** (by [travelnow.or.crylater](https://www.travelnow.or.crylater.com) on [Unsplash](https://www.unsplash.com))

In total, almost 30 000 000 (29 752 000) overnight stays have been counted in 2017 in Mecklenburg-Western Pomerania. Around one third of these (10,1 million) occurred in the summer months July and August. Guests from foreign countries came mostly from Sweden

(19 %), Denmark (14.8 %), Switzerland (13 %), The Netherlands (11.6 %) and Austria (6.5 %) – meaning that two thirds of the foreign visitors were from these 5 countries. The area of the city of Rostock accounted for almost 2 million overnight stays in 2017 with a stake of overnight stays by foreign people of 7 %) (Hanse- und Universitätsstadt Rostock 2018 b).

Also, the busiest travel months in Rostock are July and August. Furthermore, the trend over recent years shows rising numbers of tourists, with i.e. a grown December 2017 figure being as high as July 2005 (Figure 13: Arrivals at accommodation facilities (> 9 beds) (Hanse- und Universitätsstadt Rostock 2018 a: 219).

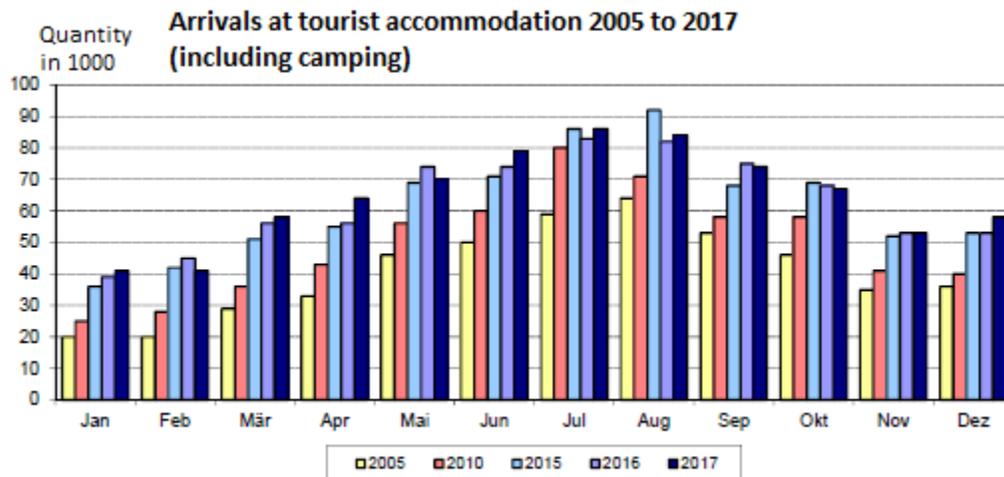


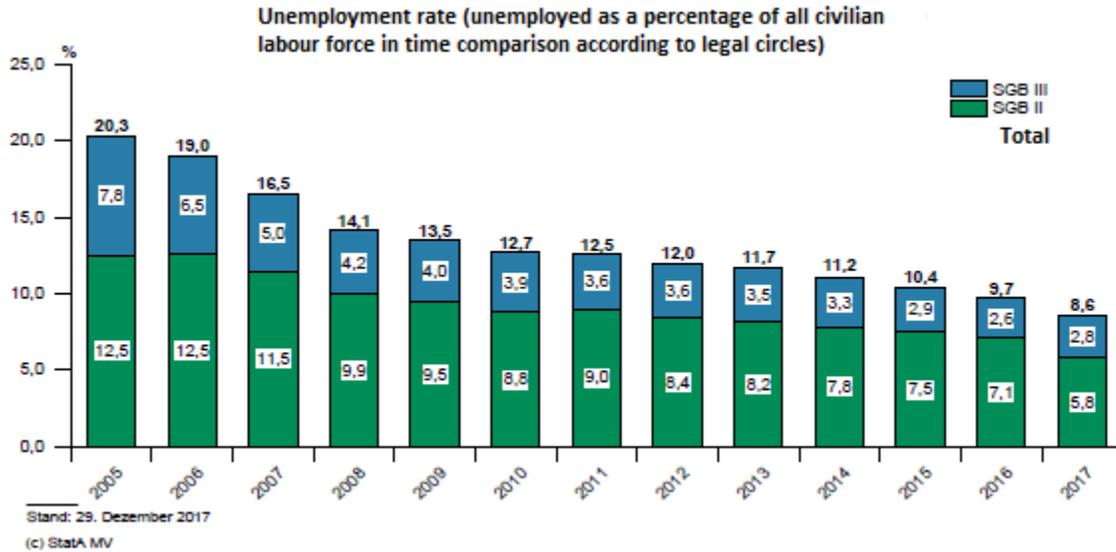
Figure 13: Arrivals at accommodation facilities (> 9 beds) (Hanse- und Universitätsstadt Rostock 2018 a: 219)

### 3.1.3 Employment and commuting

Rostock is not only the largest but also economically strongest city in Mecklenburg-Western Pomerania. Around one third of the largest companies in MV are in the Rostock region. The strongest of them such as AIDA Cruises, Nordex, Liebherr and the University Hospital Rostock are among the companies with both having the highest turnover and being the largest employers in Mecklenburg-Western Pomerania. The strongest branches include the marine economy, engineering, agriculture, medicine and tourism. Since 2012 Rostock also harbours the naval command of the German army forces. Companies also profit from a network of knowledge formed by the oldest university in the Baltic region - the University of Rostock, the Academy of Music and Theatre in Rostock, the University of Applied Sciences Güstrow as well as research institutions such as two Fraunhofer Institutes, Leibnitz Society institutions, federal research institutes and the Max Planck Institute (Planungsverband-Rostock 2019).

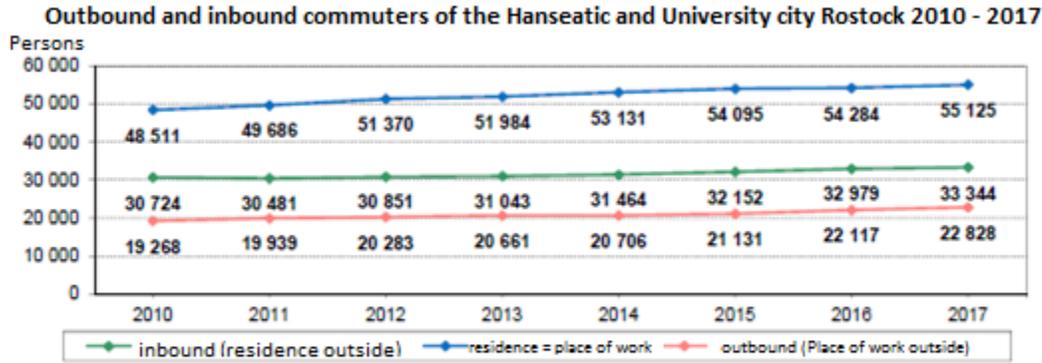
In 2016, the proportion of employed 15-64-year-olds in Western Pomerania rose from 60.7 percent in 2005 to 72.1 percent. Among the 60- to 64-year-olds, almost half (49.6 percent) were gainfully employed, whereas 4.1 percent of those aged 65 or above were gainfully employed in 2016 (Statistisches Amt Mecklenburg-Vorpommern 2018: 354). Most employees subject to social insurance contribution worked in the service sector (75 %) followed by the manufacturing industry (22 %) and agriculture and forestry, fisheries (3 %) (Statistisches Mecklenburg-Vorpommern 2018: 363).

Unemployment affected a total of 50 700 people in 2016 marking a continuous decline over the recent years. Since 2005, the number of unemployed has fallen by nearly 110 000 - a drop of more than a half (Statistisches Amt Mecklenburg-Vorpommern 2018: 354). From as high as 20.3 % in 2005, the unemployment rate hence fell to 8.6 % in 2016 in Mecklenburg-Western Pomerania (Figure 14).



**Figure 14: Unemployment rate MWP 2005-2017 (Statistisches Amt Mecklenburg-Vorpommern 2018: 368)**

The unemployment rate for Rostock almost equals the average of MV with a total of 8.2 % (8 809 people), whereas 88 489 people officially counted as employees subject to social security contributions. Besides these people in employment, Rostock also accommodates the education of around 19 000 pupils as well as more than 15 000 university students, which causes significant traffic flows by daily commuting to and from work as well as educational institutions. The travel patterns are shaped by around 33 344 people commuting to the city from the suburbs and 22 828 people travelling from the city to the suburbs in the morning, whereas in the evenings people return to their homes causing an inversion of the travel pattern. The numbers of commuters are showing an upward trend – since 2010 their number has increased by 12 percent in 2017 (see Figure 15) (Hanse- und Universitätsstadt Rostock 2018 b).



**Figure 15: Rostock, in and outbound commuters 2010 – 2017 (Hanse- und Universitätsstadt Rostock 2018 a: 118)**

Commuting is particularly reflected by the number of bus and tram users in Rostock. Out of 40.43 million passengers annually, an average number of 134 000 travels are operated by RSAG on a daily basis during the working days from Monday to Friday. On the weekend, this number is significantly lower with 75 000 on Saturdays and 42 000 on Sundays and bank holidays (Bleis 2017).

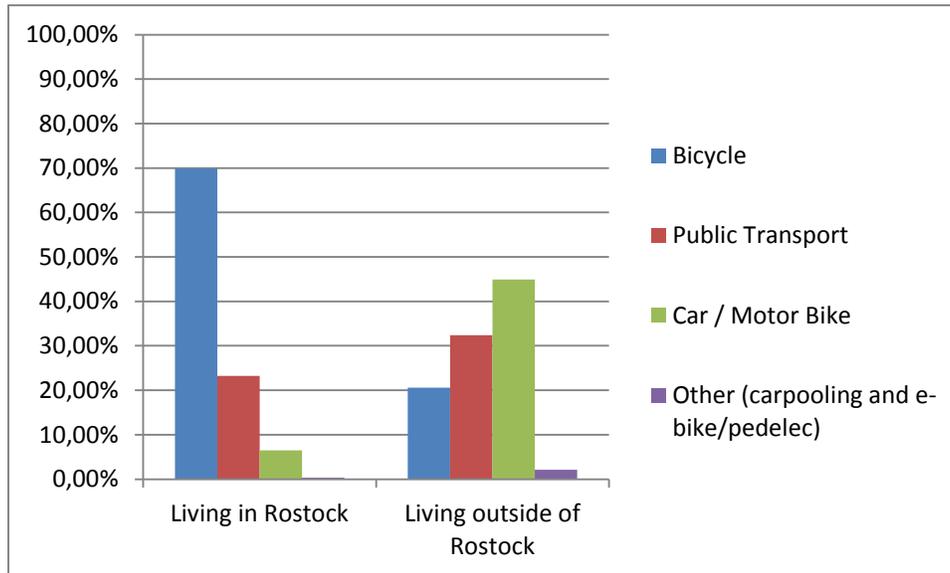
In 2012, commuting was further analysed by asking more than 5 000 people about their commuting behaviour in Rostock within the EU-project ABC Multimodal. In order to gain more knowledge on cycling infrastructure demand in Rostock, the focus of this study has been set on asking people interested in commuting by bicycle. This has therefore led to a high proportion of young (53 % are 25 years or less) university students living in Rostock responding to the surveys and interviews. The study is thus not a representative survey regarding the larger group of regular inbound and outbound commuters of a total of over 50 000 employees being subject to social insurance contributions (Hansestadt Rostock 2012).

However, some valuable conclusions may be drawn from certain parts of the study. Out of 3 549 valid responses, 95.5 % stated that they regularly commute to either their place of work (37 %), study (57 %) or school (6 %) (Hansestadt Rostock 2012).

Most of the respondents who regularly commute live in the Hanseatic city of Rostock (87.5 %); only 12.5 % of them live outside the city. Comparing these two groups reveals that most respondents living in the city of Rostock were students (61 %) and only 30 % were employees, whereas of those living outside the city the proportion of students was much less 27 % while representing a significantly higher number of workers (48 %). Also, of those people who have

stated to live in the city, 96.5 % stated that their commuting destination was also Rostock. And 92 % of those living outside the city borders named Rostock as their commuting destination (Hansestadt Rostock 2012).

A major difference between city dwellers and suburban population can be found in their modal choices for their regular travel (Figure 16).



**Figure 16: Main means of transport of respondents (Hansestadt Rostock 2012)**

The results showed that commuting by the respondents within Rostock is mostly done by bicycle (69.9 %) and less by public transport (23.2 %) or car (6.5 %). By contrast, for respondents commuting from their place of residence outside the city, the meaning of using the car has been far higher with 44.9 % choosing the car/motorbike over public transport (32.4 %) and the bicycle (20.6 %). Asked why those living outside the city rather prefer cars over bicycles, respondents named i.e. too large distances, the weather conditions and lacking comfort, transport possibilities and speed (Hansestadt Rostock 2012).

Of the 423 respondents living outside Rostock, 203 people commuted every day for work reasons and for this they mainly used the car/motorbike (58.6 %) and less public transport (15.8 %). If the purpose of commuting was schooling or training, public transport was the main choice (62.8 %). Those who commuted from outside for study reasons also used public transport (43.8 %), but about a third also choose the car/motorbike and a quarter even the bicycle (Hansestadt Rostock 2012).

Timely travel patterns during working days related to commuting are concentrated on two peak periods: From 07:00 to 08:00 in the morning and from 15:30-16:30 in the afternoon (Hansestadt Rostock 2015).

Regarding the commute over the city borders of Rostock, Figure 18 (outbound commuters) and Figure 19 (inbound commuters) show distinct spatial patterns of where commuting is targeted to and originating from. Most people commuting outbound (from the city to the district) travel to suburban areas such as Bentwisch, Dummerstorf and Bad Doberan. Most people commuting inbound (from the district to the city) travel from suburban areas such as Dummerstorf, Bad Doberan and Broderstorf to the city area of Rostock (Figure 17).

**Number of outbound and inbound commuters of Rostock to and from selected municipalities of the District of Rostock with more than 200 commuters in 2017**

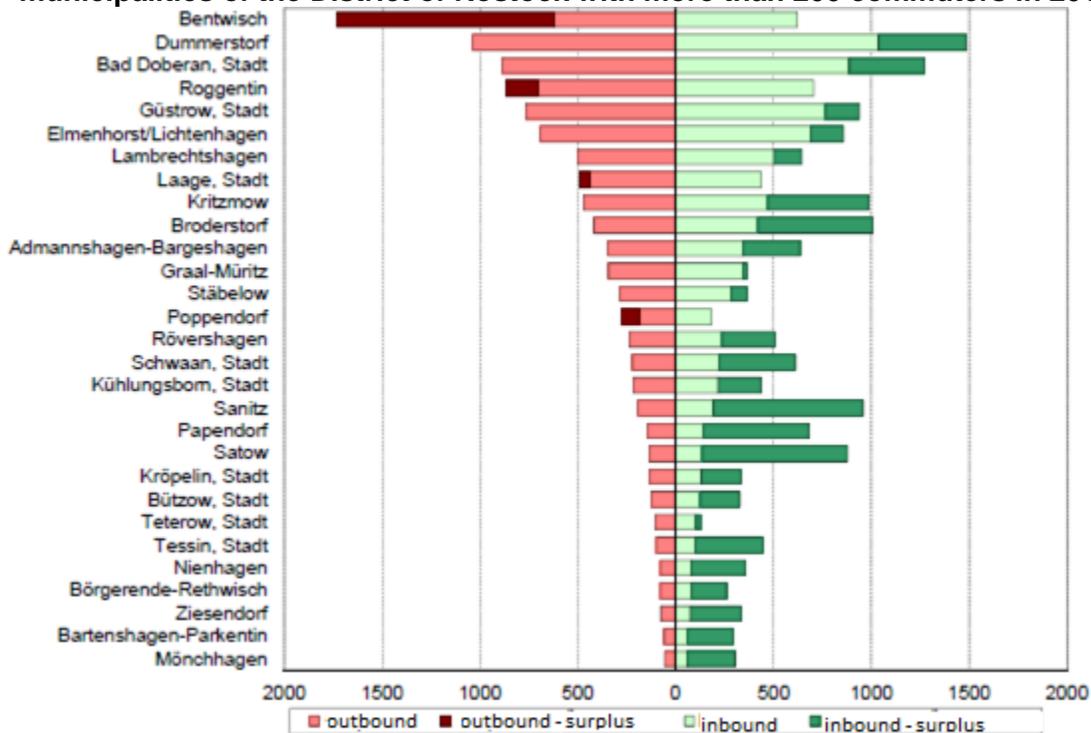
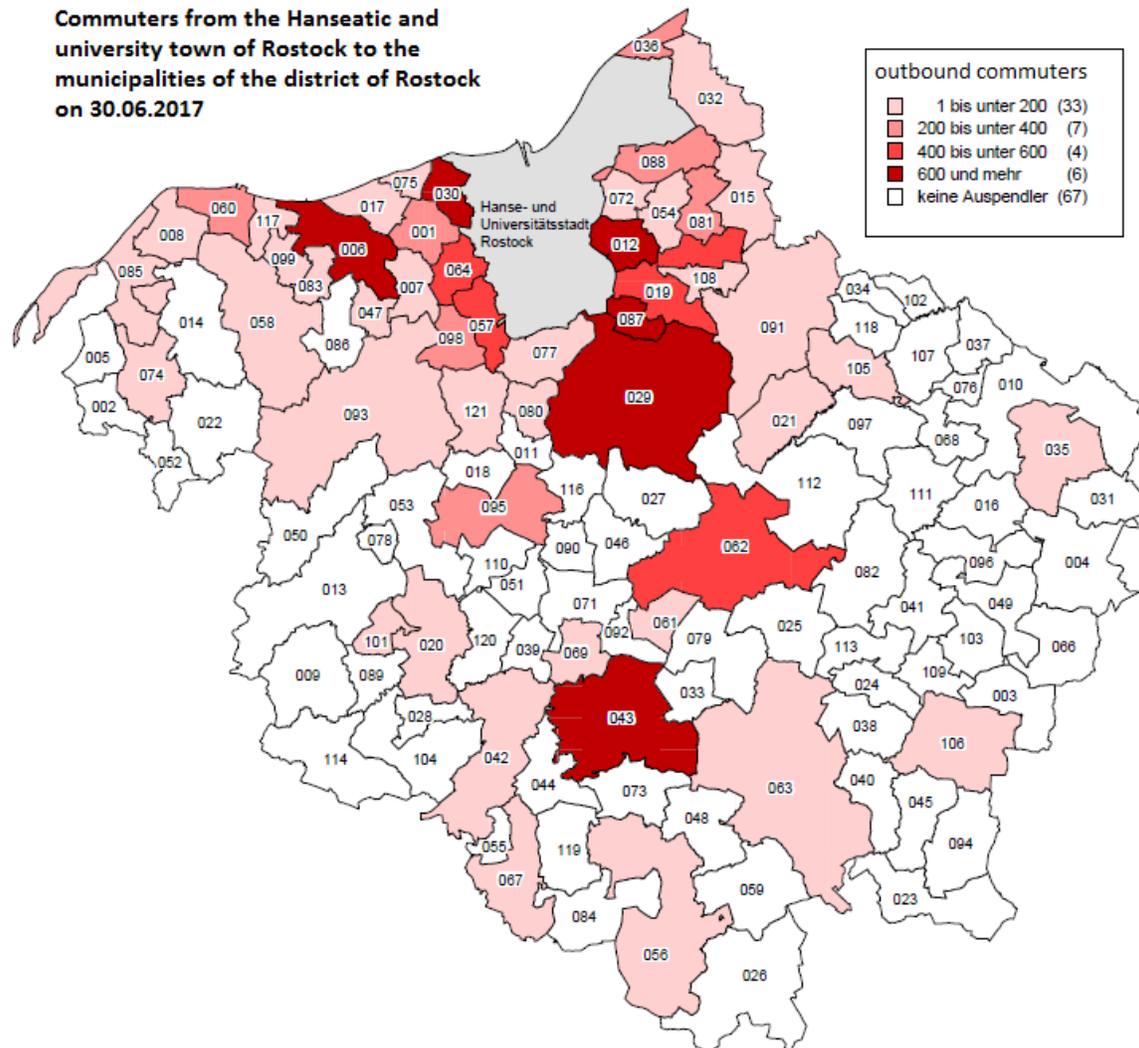


Figure 17: Rostock, in and outbound commuting (Hanse- und Universitätsstadt Rostock 2018 a: 118)

Spatial patterns of commuting to-and-from- destinations are highlighted in Figure 18 and Figure 19, where the different municipalities and the absolute numbers of commuters are shown. These maps reveal that most commuters with residence or destination outside Rostock are concentrated in the vicinity of the city of Rostock. Larger communes, i.e. small cities, such as Schwaan, Laage and Güstrow, may be viewed as exceptions. Due to e.g. their larger population, better connections and (job or schooling) opportunities they may cause higher absolute numbers

of commuters to/from Rostock. The informative value of the maps may be limited though. Since the displayed municipalities vary in size, the different absolute numbers of commuters are not calculated based on the same sized spatial entity – leading to larger absolute commuter numbers particularly in larger municipalities.



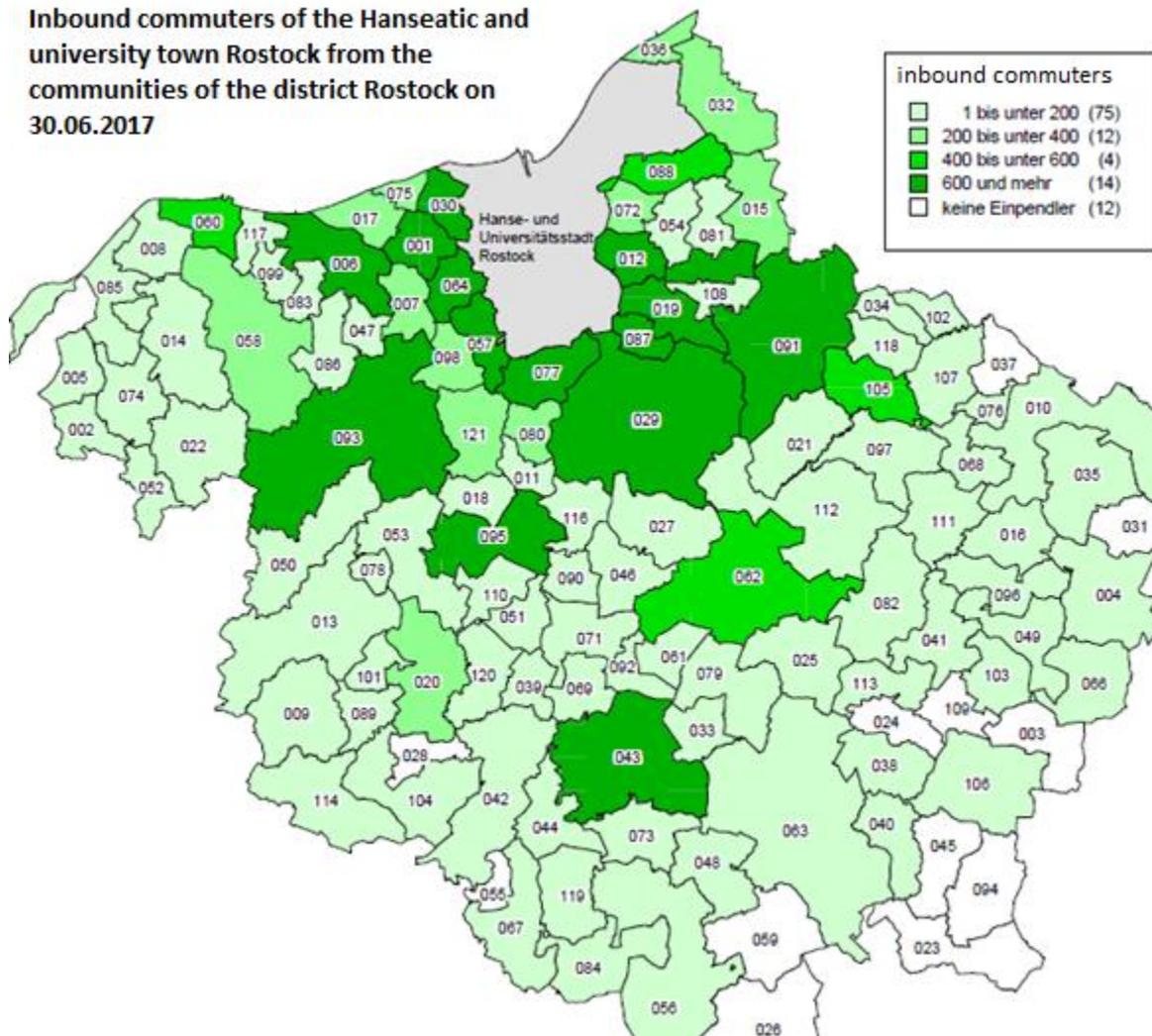
**Figure 18: Outbound commuters from the City to the District (Hanse- und Universitätsstadt Rostock 2018 a: 118)**

**Table 1: Municipalities within Rostock District (Hanse- und Universitätsstadt Rostock 2018 a: 118)**

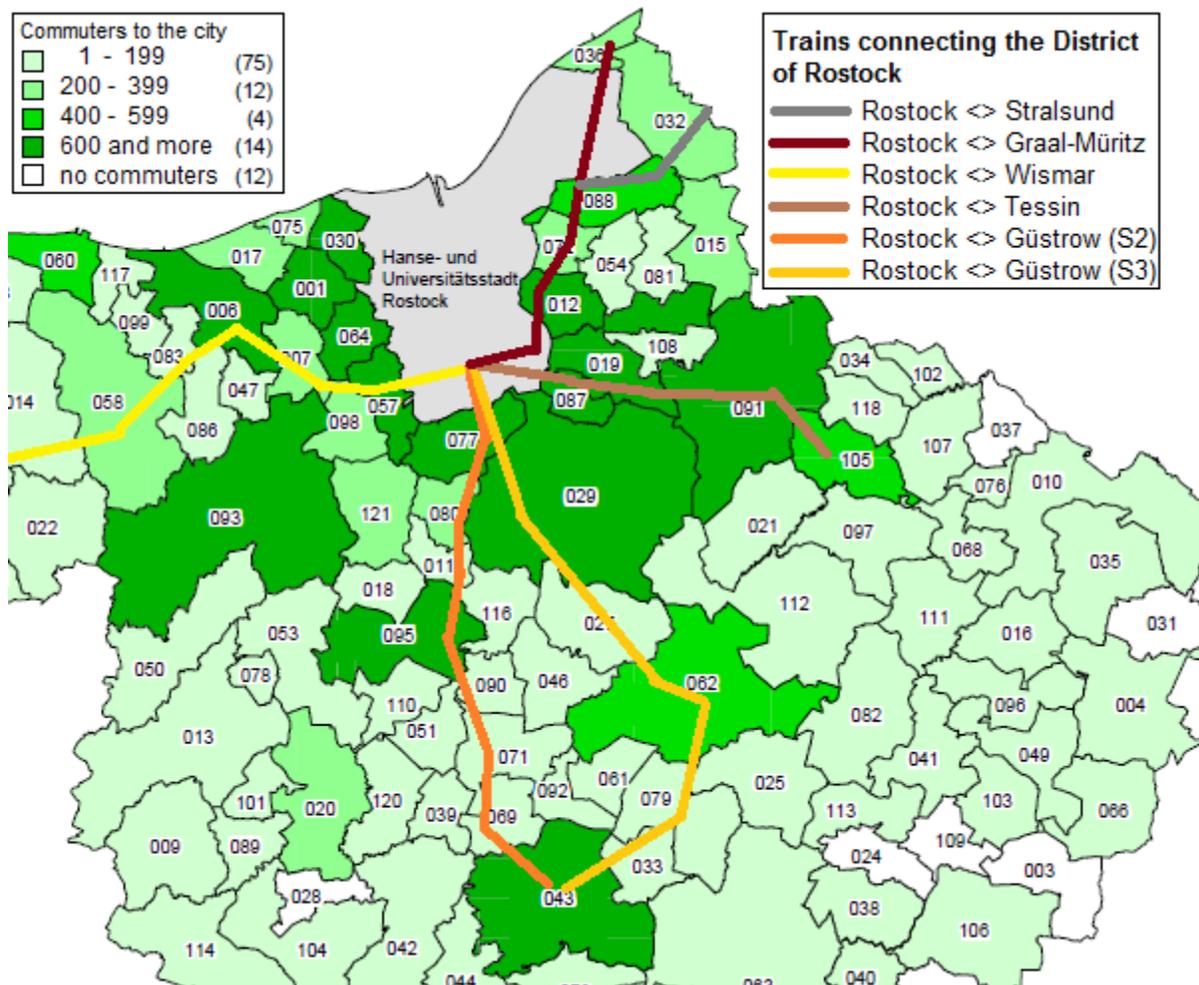
001 Admannshagen-Bargeshagen	031 Finkenthal	061 Kuhs	091 Sanitz
002 Alt Bukow	032 Gelbensande	062 Laage, Stadt	092 Sarmstorf
003 Alt Sührkow	033 Glasewitz	063 Lalendorf	093 Satow
004 Altkalen	034 Gnewitz	064 Lambrechtshagen	094 Schorssow
005 Am Salzhaff	035 Gnoien, Stadt	066 Leikendorf	095 Schwaan, Stadt
006 Bad Doberan, Stadt	036 Graal-Müritz	067 Lohmen	096 Schwasdorf
007 Bartenshagen-Parkentin	037 Grammow	068 Lühburg	097 Selpin
008 Bastorf	038 Groß Roge	069 Lüssow	098 Stäbelow

009 Baumgarten	039 Groß Schwiesow	071 Mistorf	099 Steffenshagen
010 Behren-Lübchin	040 Groß Wokern	072 Mönchhagen	101 Steinhagen
011 Benitz	041 Groß Wüstenfelde	073 Mühl Rosin	102 Stubbendorf
012 Bentwisch	042 Gülzow-Prüzen	074 Neubukow, Stadt	103 Sukow-Levitzow
013 Bernitt	043 Güstrow, Stadt	075 Nienhagen	104 Tarnow
014 Biendorf	044 Gutow	076 Nustrow	105 Tessin, Stadt
015 Blankenhagen	045 Hohen Demzin	077 Papendorf	106 Teterow, Stadt
016 Boddin	046 Hohen Sprenz	078 Penzin	107 Thelkow
017 Börgerende-Rethwisch	047 Hohenfelde	079 Plaaz	108 Thulendorf
018 Bröbberow	048 Hoppenrade	080 Pölchow	109 Thürkow
019 Broderstorf	049 Jördenstorf	081 Poppendorf	110 Vorbeck
020 Bützow, Stadt	050 Jürgenshagen	082 Prebberede	111 Walkendorf
021 Cammin	051 Kassow	083 Reddelich	112 Wardow
022 Carinerland	052 Kirch Mulsow	084 Reimershagen	113 Warnkenhagen
023 Dahmen	053 Klein Belitz	085 Rerik, Stadt	114 Warnow
024 Dalkendorf	054 Klein Kussewitz	086 Retschow	116 Wiendorf
025 Diekhof	055 Klein Upahl	087 Roggentin	117 Wittenbeck
026 Dobbin-Linstow	056 Krakow am See, Stadt	088 Rövershagen	118 Zarnewanz
027 Dolgen am See	057 Kritzmow	089 Rühn	119 Zehna
028 Dreetz	058 Kröpelin, Stadt	090 Rukieten	120 Zepelin
029 Dummerstorf	059 Kuchelmiß		121 Ziesendorf
030 Elmenhorst/Lichtenhagen	060 Kühlungsborn, Stadt		

**Inbound commuters of the Hanseatic and university town Rostock from the communities of the district Rostock on 30.06.2017**



**Figure 19: Inbound commuters from the District to the City (Hanse- und Universitätsstadt Rostock 2018 a: 121)**



**Figure 20: District Rostock: regional train line coverage (base map: Hanse- und Universitätsstadt Rostock 2018)**

Compared to the city of Rostock, the District Rostock is rather sparsely covered by regional train lines (Figure 20) and regional bus lines with often less than one departure per hour making commuting less convenient than other more time-flexible modes of transport. As Figure 20 shows, there are six different regional train lines in the District of Rostock: the regional trains to Wismar (west), to Tessin (east), to Graal-Müritz/Stralsund (north-east), and the two city train lines to Güstrow (south). These train lines may indeed stimulate commuting by train since almost one fourth of the municipalities could be considered as being in close enough proximity to a train stop. However, more than 75 % of the municipalities in the district are lacking access by train. Given that the regional bus lines operated by Rebus transport only a fraction of the passenger numbers in the district compared to the RSAG numbers of passengers transported within the

city, and that a main focus of Rebus is rather pupils (Griesbach 2015), further investigation is needed to determine to what extent the public transport is sufficient to influence people to commute by public transport rather than by car. Cars may in fact represent the only viable option especially for people living or working in suburban areas that are poorly or not connected with public transport.

### 3.1.4 Public transport

The public transport providers in Rostock and its surrounding district are organised by the Traffic Association Warnow (in German: Verkehrsverbund Warnow, VVW). The VVW is an association of the 5 main local and regional public transport providers in Rostock and its surrounding district (see Figure 21), comprising the following companies (Mazouzi, Cihon & Warszycki 2018: 65):

- *Rostocker Straßenbahn AG [RSAG] – (urban trams and bus connections)*
- *Rebus - Regionalbus Rostock GmbH – (regional and urban-regional bus connections)*
- *DB Regio AG (inner-city and urban-rural trains)*
- *Weißer Flotte GmbH (urban ferry connections)*
- *Mecklenburgische Bäderbahn Molli GmbH (historical train connection)*

*The VVW was founded on 27th February 1997 and it is in operation since more than 20 years. It has most impact in the fields of urban and urban-rural linkages, ticketing and PT information. It aims at optimising and coordinating the entire PT network in its area of operation and creating uniform conditions of transport with coordinated timetables, network connections and tariffs.*

- *Operating a single-ticket system valid for all different modes of public transport*
- *Creating uniform conditions of carriage*
- *Providing up-to-date and clear passenger information*
- *Coordinating traffic with adjacent regions*



Figure 21: VVW area [<https://www.verkehrsverbund-warnow.de/karten-plaene/verbundgebiet.html>; 2019-04-30]

According to statistics, the public transport of the VVW served 2030 stops with a total network length of 4 550 km (Figure 22). This led to the transportation of 62 000 000 passengers on about 20 000 000 driven km (VVW 2016 a).

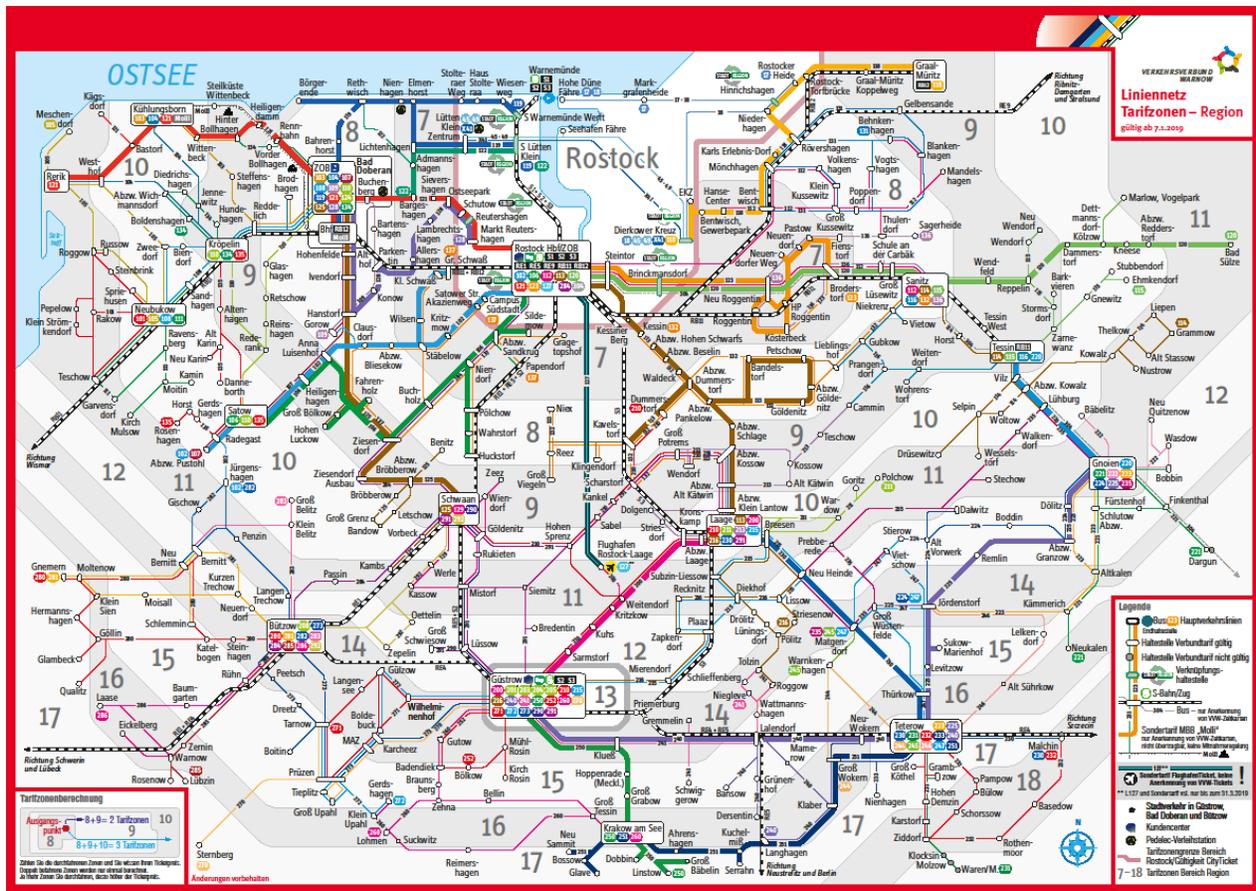
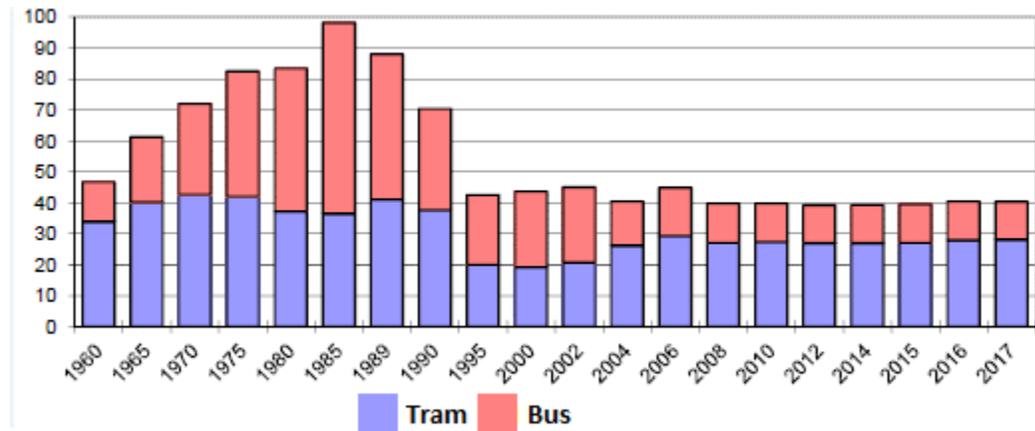


Figure 22: Public transport plan of District Rostock (VWV 2019)

Considering the city of Rostock and its main operator RSAG alone, numbers show 40 000 000 transported passengers with their 70 buses and 53 trams in a network of over 500 stops and more than 200 km line network length (RSAG 2019).

The use of public transport has been stable over recent years (Figure 23). Public transport use has reached a maximum in 1985 and it has been strongly decreasing in the early 1990s with relatively consistent numbers from 1995 - 2017.



**Figure 23: Transported persons by Rostock PT [millions] (Hanse- und Universitätsstadt Rostock 2018 a: 207)**

The District of Rostock is connected to the city and its PT network by several regional bus lines that start/end at certain intermodal hub stations such as Rostock main train station and central bus station, the stations Lütten Klein or Warnemünde Werft. In the District of Rostock, the bus company Rebus is by far the most important provider of public transport services (Rebus 2019 a). In fact, based on the Regional Transport Plan Middle Mecklenburg / Rostock (*Regionaler Nahverkehrsplan Mittleres Mecklenburg / Rostock*), Rebus provides the entire bus related public transport including the interconnections to the city of Rostock (Rebus 2019 b).

While the geographic area of the district of Rostock is much larger, the public transport offer is significantly less dense and frequent compared to the city of Rostock. This is particularly reflected in the user numbers: while the whole VVW counts 62 Mio passengers annually, Rebus transported around 5 Mio of them (VVW 2016 b). By contrast, RSAG transports around 40 Mio passengers per year around the city area. Although the number of vehicles is almost equal (Rebus: 150 buses, RSAG 123 buses and trams), Rebus is, however, also a smaller company (250 employees) compared to RSAG (739 employees) (Rebus 2019 c; RSAG 2019).

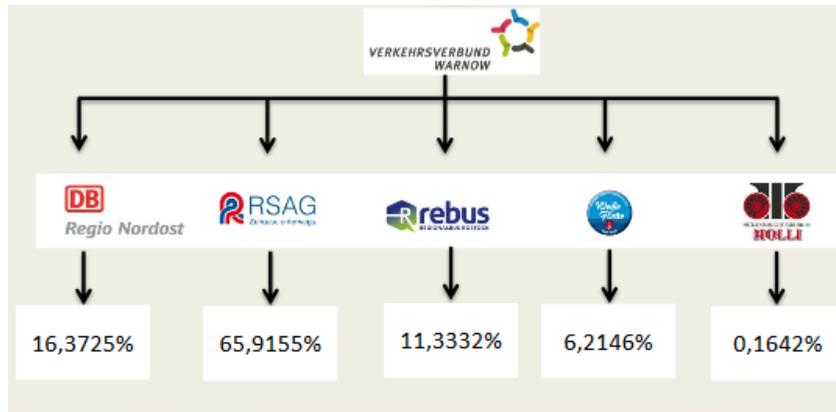


Figure 24: Distribution of ticket income between the PT providers (VWV 2016 b)

The difference in public transport use between the city and the district is also highlighted in the ticket income distribution (Figure 24): Around 72 % of the income is distributed back to the public transport providers of Rostock City (65.92 % RSAG and 6.21 % Weiße Flotte), only 11 % are directly related the transport offer in the district (11.33 % Rebus and 0.16 % Molli). Though it must be noted that Deutsche Bahn provides both the city and the district with regional and city trains, hence its 16 % income from VWV account for the City as well as the District of Rostock.

### Cross-border public transport

The international axis between Rostock and Gedser, which is served by the ferry operator Scandlines, represents cross-border public transport connecting Germany and Denmark via the Baltic Sea. Including the ferry line to Trelleborg (Sweden), the number of annual ferry passengers travelling via the port of Rostock has been increasing over the past 5 years: from 1.9 Million in 2013 to an all-time high score of 2.55 Million in 2018 (Rostock Port 2019). These numbers represent all passengers, hence also these travelling by e.g. car, truck or bus. In 2018, Scandlines reported 2 500 actual foot passengers per year on their Rostock-Gedser ferries. In fact, due to economic reasons foot passengers represent not the target group the ferry operator is focused on. The capacity for foot passengers may even be considered as being too limited to be focused on. Because the sizes of the two ferry ships have been reduced before putting them into service, only 1 300 instead of originally planned 1 600 passengers may board the ship. A fully booked ferry with more economically rewarding cars, trucks and buses can thus already reach the passenger limit without additional foot passengers (Möllern, M. / Dietz, M., personal interview, 16<sup>th</sup> November 2018).

However, potential measures have been implemented to better serve the needs of foot passengers. First, the public transport on both sides (in Germany and Denmark) has been synchronised, meaning that bus timetables have been adjusted to match both the ferry departures and arrivals. Second, the Intercombi Ticket has been introduced as a single cross border ticket between Rostock (Germany) and Nykøbing Falster (Denmark) that is valid across different modes in Rostock (tram, bus and city train), the ferry over the Baltic Sea and the bus between Gedser and Nykøbing Falster. According to Scandlines, the Intercombi ticket is mostly used by people that have meetings and partly by regular foot passengers that either commute or are on day trips. The demand by foot passengers is, however, limited since both ports are not directly situated in urban areas; and also duty-free shopping has been abolished within the EU, which is therefore not anymore representing a “reason to go” (Möllern, M. / Dietz, M., personal interview, 16<sup>th</sup> November 2018).

Regarding timely travel patterns, most (foot-) passengers use the Scandlines ferries during the high season, particularly when vacation periods start and end between June and the end of August. Also, events such as the Hanse-Sail and music festivals trigger additional passengers. Another peak, especially of Scandinavian tourists, can be observed during the Christmas season, when the Christmas market of Rostock attracts many visitors also from the Baltic Sea region. However, tourists renting the wide-spread holiday houses in Denmark or other Scandinavian countries usually opt for taking the car due to e.g. the amount of luggage needed. A similar reason may account for the southbound travellers during the winter season e.g. around weeks 6 and 7. These mostly travel by car, less by bus and usually not as a foot passenger. Repeating weekly travel patterns can be observed by commuters: Northbound travels peak on Monday whereas southbound travels are highest on Thursdays and Fridays mostly done by construction, IT and social workers (Möllern, M. / Dietz, M., personal interview, 16<sup>th</sup> November 2018).

### 3.1.5 Conclusion and recommendations

The population of Rostock has been slightly growing over the past 15 years from around 195 000 to 208 000 in 2018. It is expected to further grow up to around 230 000 by 2035. Also, the city's surrounding District Rostock has been growing significantly in the past and further growth is expected.

Adequate development of public transport is thus representing a major challenge. Particularly daily commuting represents a major car-reliance, especially for those who commute to and from outside the city area for work related reasons. In addition, there may be other kinds of commuters in high numbers that have not yet been sufficiently analysed such as those who commute to use the infrastructure of the Hanseatic city of Rostock, i.e. shopping, sports, culture, leisure, etc. To mitigate the car reliance and to target measurements more efficiently, representative surveys of randomly selected commuters may be necessary by the Hanseatic City of Rostock in cooperation with the district of Rostock and the Office of Spatial Planning.

Compared to the well-developed public transport network of the RSAG with its bus and tram lines within the city borders and the city trains of Deutsche Bahn, the District of Rostock can only offer a rather sparse network of regional bus and a few train lines with mostly infrequent connections. Hence, to curb the car-reliant commuting and besides providing more appropriate cycling infrastructure, a reliable and frequent PT system should not end at the city borders, but instead, spread beyond at least into those urban settlements where most of the commuting originates. This may include the extension of bus, tram lines or city trains to the suburbs such as Kritzmow, Roggentin or Rövershagen. Since administrative borders are often too high regarding the responsibility for investments, a supporting measurement can be the incorporation of close local authorities by the city of Rostock into their administrative area.

Accompanying measurements may tackle the attractiveness of commuting by car. A cheaper public transport or higher costs of car-commuting including parking fees may mean less economic incentive for using a car. And further infrastructural measures such as the creation / improvement of Park & Ride stations at places where the public transport network ends at the city borders may also be an option for the future.

### Cross-border public transport

Curbing the car-reliant mobility is not particularly easy on the cross-border level, since the economic needs of the ferry operators as well as external circumstances must be considered. For example, unfavourable weather conditions can significantly delay ferry arrivals to a time point that subsequent public transport in the port city is not adjusted to. A common ticket between different public transport operators, such as the Intercombi ticket, may lead to additional legal responsibilities (e.g. being counted as the “travel-organising” party for the whole journey although only one part has been served) as well as higher probabilities to reach the passenger capacity limits.

Nevertheless, environmental pollution has been reduced in recent years by replacing the ferries with hybrid ships using electric engines powered by gasoline generators and supported by batteries within coastal and port areas.

### 3.2 Guldborgsund Kommune (Denmark)

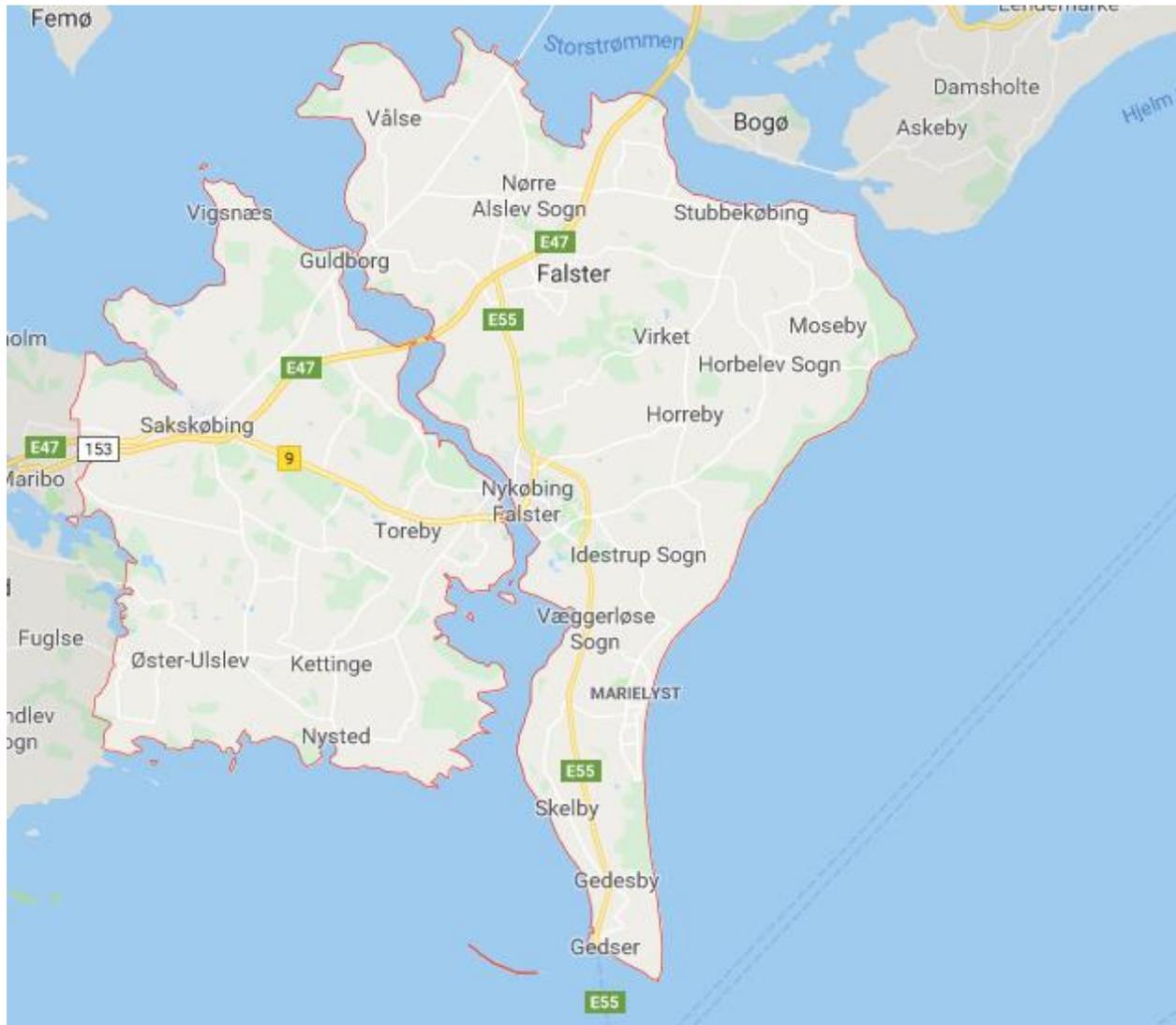


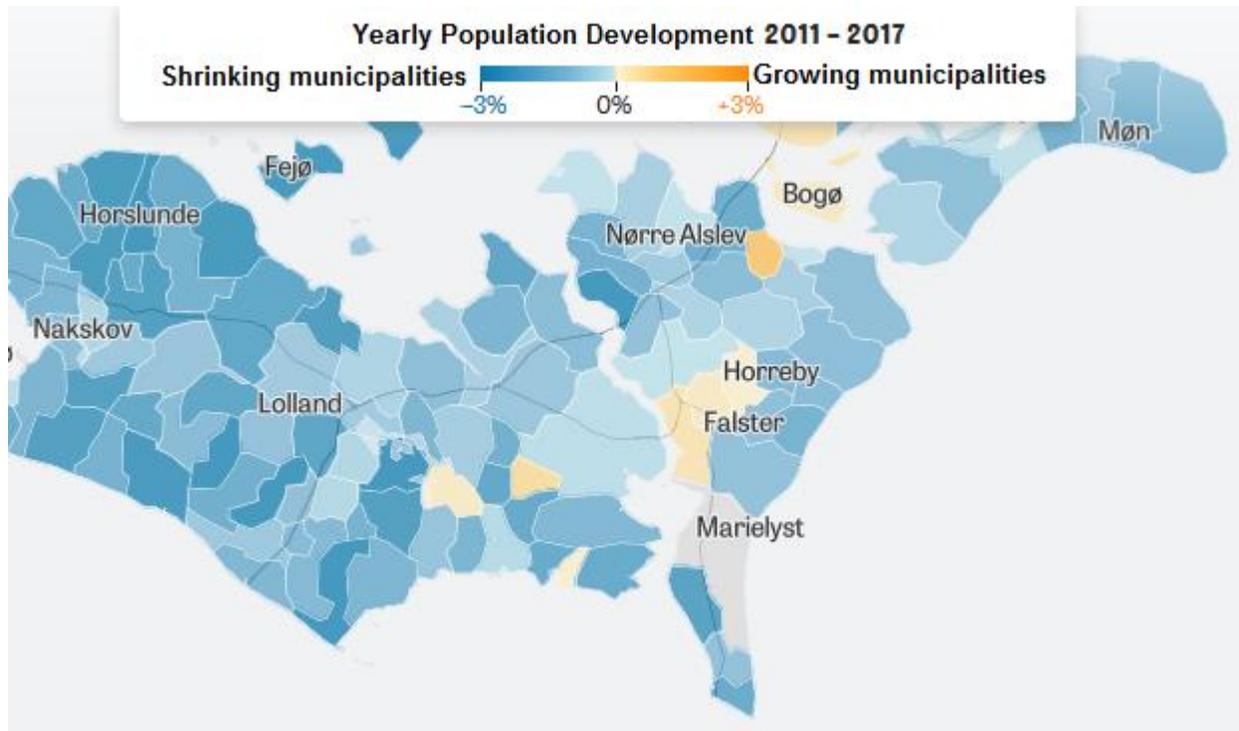
Figure 25: Google Maps (2019): Guldborgsund Kommune [<http://maps.google.com/maps>; 2019-04-12].

Guldborgsund commune is an area of 906,97 km<sup>2</sup> inhabiting a population of 60 938 (January 1, 2019) (Guldborgsund Kommune 2019 a) in the South East of Denmark. The municipality consists of two major Baltic Sea islands: Falster and the eastern part of Lolland. Its capital is Nykøbing Falster with approx. 16,700 inhabitants representing the largest city in the municipality (Guldborgsund Kommune 2018 a).

### 3.2.1 Population

Besides Nykøbing Falster, the four largest settlements are: Sakskøbing (4 670 inhabitants), Sundby (2 953), Nørre Alslev (2 417) and Stubbekøbing (2 271) (Brinkhoff 2019 a).

Guldborgsund's population has been decreasing over the last decade. Numbers from 2006 – 2019 indicate a population shrinkage from 63 451 in 2006 to 60 930 in 2019 representing a decrease of almost 4 % over this period (Brinkhoff 2019 a).



**Figure 26: Guldborgsund Population Development 2011-2017 (Blickle et. al. 2019)**

Apart from its capital, Guldborgsund Kommune is marked by rather small settlements below 5 000 inhabitants and rather rural areas surrounding them.

Besides the three counties Godsted, Dollefjelde and Lillebrande, only the suburban area of and around Nykøbing Falster has been growing over the recent years. All other, predominantly rural, areas have seen a decline in population numbers as it is spatially illustrated in Figure 26 (Blickle et. al. 2019).

It is estimated that almost 30 % of the population is living in rural areas, while more than 70 % live in areas considered urban (Figure 27).

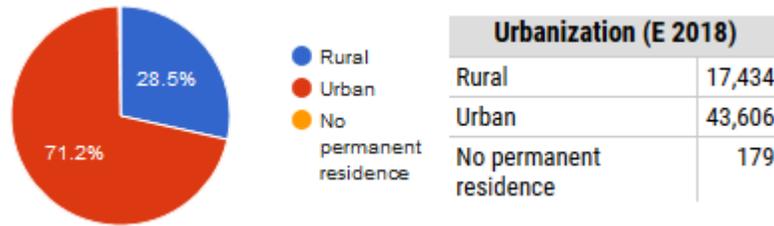


Figure 27: People of Guldborgsund Municipality living in urban and rural areas (Brinkhoff 2019 b)

Current numbers of age distribution in Guldborgsund Municipality show that more than 50 % of the population is between 18-64 years old, whereas the number of 0-17 year olds is almost one third smaller than the 65+ age group as it can be seen in Figure 28 and Figure 29.

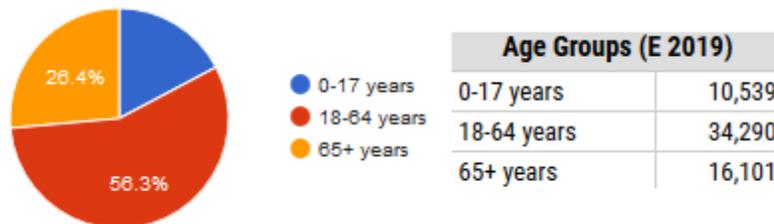


Figure 28: Age distribution (Brinkhoff 2019 b)

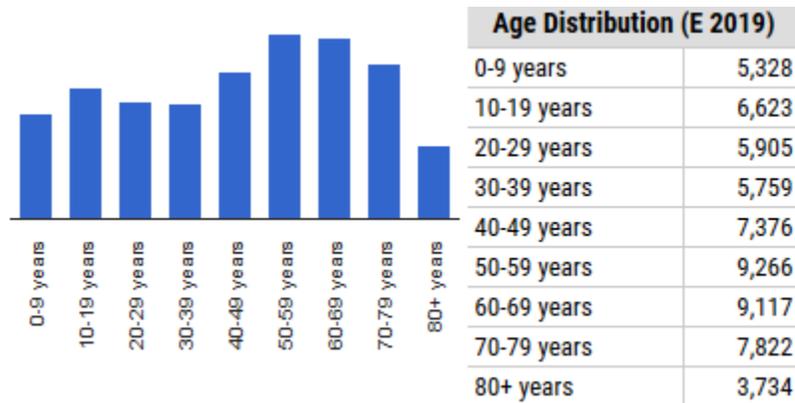


Figure 29: Age distribution (Brinkhoff 2019 b)

As one forecast shows, the population in Guldborgsund Municipality will only slightly increase by around 0.2 % from 2018-2022. It is especially the age group 0-9 and 70 plus where an increase in the population can be seen (Guldborgsund Kommune 2018 a).

An in-depth forecast for population development by age and sub-areas has been commissioned by the Guldborgsund commune in 2015 in order to create an additional important element for municipal planning and management.

The forecast showed that the population was expected to fall from 60 829 people in 2015 to 58 435 people in 2028 representing a population decrease by 2 394 or 3,9 % (see Figure 30), whereas on the national level an increase of population by 5.0 % is expected (COWI 2015).

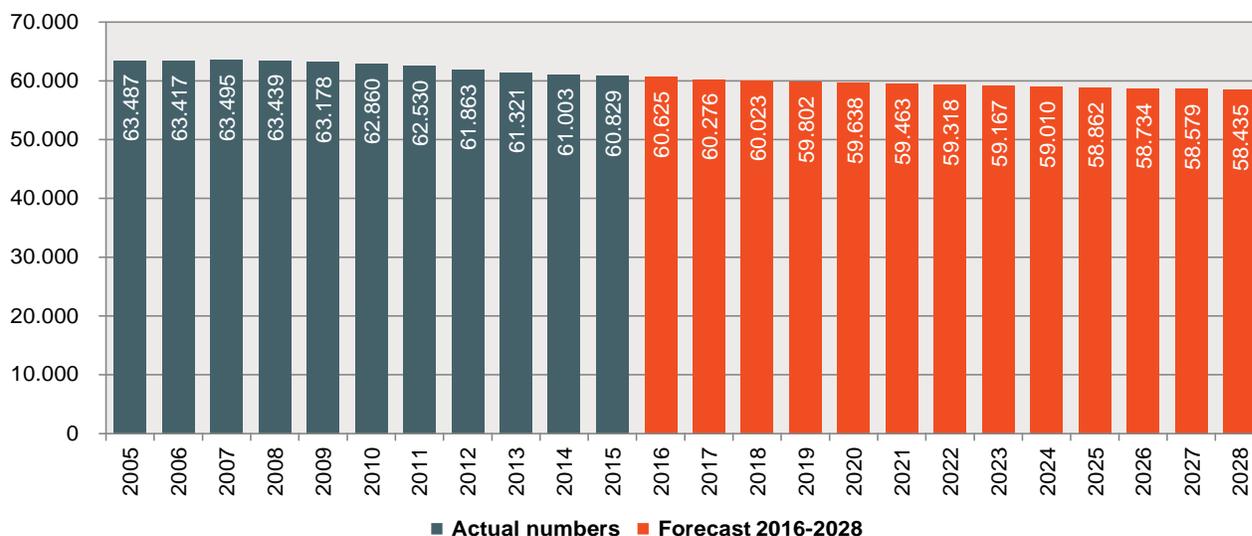


Figure 30: Population Forecast Guldborgsund 2015-2028 (COWI 2015)

The decrease in population numbers resembles a trend that can be observed since at least 2007 with an average decrease of about 0.43 % per year. In actual numbers this would mean an average decline of 266 people per year calculated from values from -667 (in 2011) up to +78 (in 2006). The decline in population can mainly be attributed to a birth deficit (i.e. fewer births than deaths). As a matter of fact, the birth balance represents an average annual deficit of -362 with 516 births and 878 deaths per year. In the forecast scenario the birth deficit will further remain under -300 with expected -330 on averages per year (COWI 2015).

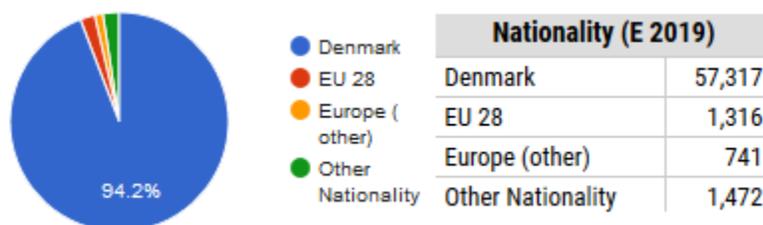


Figure 31: Nationalities of Guldborgsund Municipality inhabitants (Brinkhoff 2019 b)

Regarding migration, the average surplus has been 97 persons annually (i.e. 2 974 immigrants and 2 877 per year). The surplus number of people migration is furthermore expected to rise to 145 persons per year in the forecast period until 2028 (COWI 2015). In 2016, the number of inhabitants has even increased by 244, mainly because of strong migration from other parts of Denmark as well as immigration from abroad (Centre for Vækstanalyse 2018). People of Danish nationality therefore account for ca. 94.2 % of the inhabitants (Figure 31). It has furthermore been calculated that 91.7 % of the citizens of Guldborgsund Municipality were born in Denmark, meaning that 8.3 % were born in another country (Figure 32).

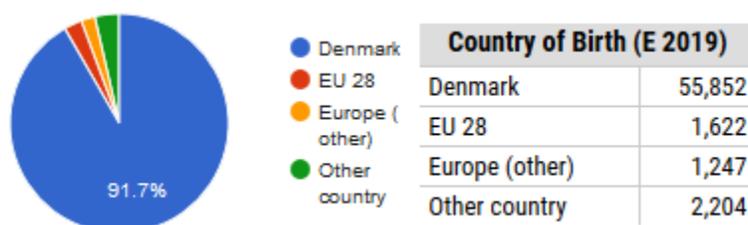


Figure 32: Country of birth of Guldborgsund Municipality inhabitants (Brinkhoff 2019 b)

In a growth comparison on the national level, Danish municipalities grew between +2.22 % and -1.83 % in 2013-2014. Among the 98 municipalities Guldborgsund ranked no. 84 with a negative growth of -0.29 % (COWI 2015).

In terms of age-distribution, the development of population numbers is expected to vary between the age groups. On average the population will become older; besides the rather small age group of 0-2 years, the only age group increasing in numbers of people will be the 67+ age group as it can be seen in Figure 33 (COWI 2015).

Alder	2015	2028	Forskel	Udvikling
0-2 år	1.366	1.507	141	10,3%
3-5 år	1.646	1.583	-63	-3,8%
6 år	574	541	-33	-5,7%
6-16 år	7.100	6.104	-996	-14,0%
17-24 år	5.213	4.483	-730	-14,0%
25-42 år	10.515	9.898	-617	-5,9%
43-59 år	15.185	12.700	-2.485	-16,4%
60-64 år	4.703	4.697	-6	-0,1%
65-66 år	1.819	1.798	-21	-1,2%
67-79 år	9.760	10.441	681	7,0%
80+ år	3.522	5.224	1.702	48,3%
<b>Total</b>	<b>60.829</b>	<b>58.435</b>	<b>-2.394</b>	<b>-3,9%</b>

Figure 33: Population development forecast by age group (COWI 2015)

The estimations therefore point to growing shares of 60+ year old age groups in the total population by 2028. Another fact is highlighted in Figure 34: Guldborgsund is also expected to have larger shares of all older age groups starting in the mid-40s and above in comparison to national level forecasts (COWI 2015). Due to the high proportion of elderly citizens, Guldborgsund Municipality also ranks high among the municipalities in the region with the lowest proportion of citizens of working age. This means that 59% of the citizens are aged between 16 and 64 years representing a lower proportion compared to the national level (Centre for Vækstanalyse 2018).

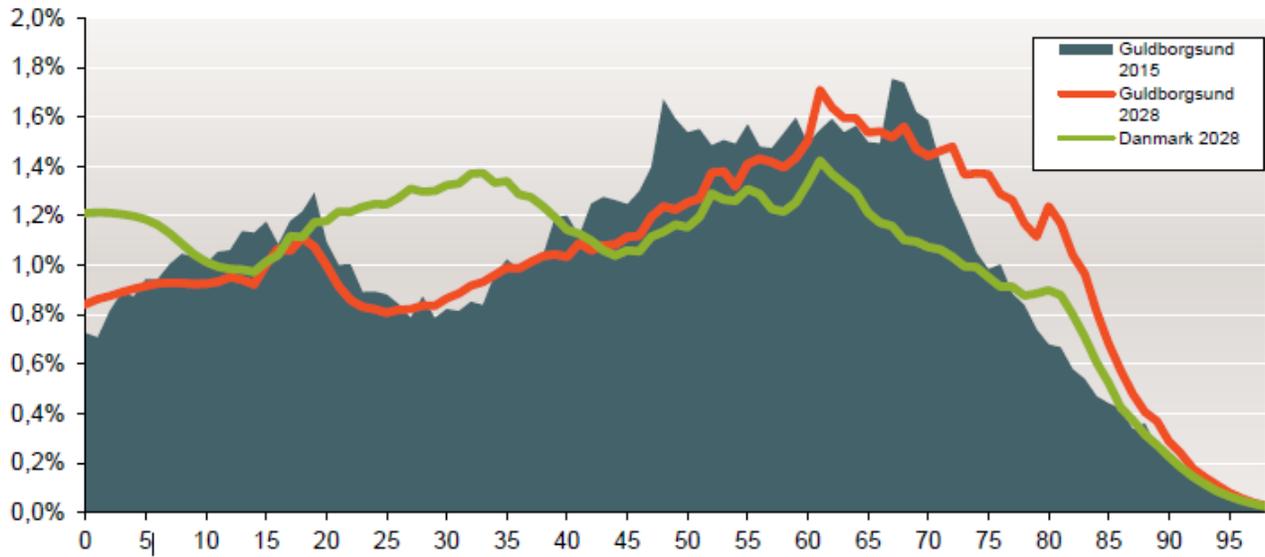


Figure 34: Relative age distribution 2015 (Guldborgsund) and 2028 (Guldborgsund and national level forecast)

Land og by område	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Main settlements	100	100	100	100	100	100	100	101	101	101	101	102	102	102
Capital city	100	100	99	99	99	99	99	99	99	99	99	99	99	99
Rural area	100	99	97	96	95	94	93	92	91	90	89	88	87	86
Rural centres	100	100	99	99	99	99	98	98	98	98	98	98	98	98
Larger villages	100	99	98	98	97	96	95	95	94	93	92	92	91	90
Touristic centre	100	102	104	105	107	108	110	111	113	114	116	117	118	120

Figure 35: Indexed population development within different settlement types (COWI 2015)

Considering the spatial dimension of population growth/shrinkage, it is expected that the number of inhabitants remain rather constant in the capital city Nykøbing Falster (102 % in 2028 compared to 2015 numbers), in the central cities (99 %) and in the rural centres (98 %). However, in the rural area and rural villages, the population is estimated to shrink significantly more by 10 to 14 percentage points. Population of the touristic area around Marielyst and its beaches is, however, expected to grow by up to 20 percentage points (Figure 35).

Regarding the topic of housing, it was expected that around 100 new housing units will be built on average per year by 2028 (COWI 2015). Further research may be necessary where these will be built and to what extent this can challenge public transport planning by influencing the demand side.

### 3.2.2 Tourism

Guldborgsund represents Denmark's southernmost municipality. The area is recognized to possess not only about space for living but also an attractive area for tourism. Guldborgsund sees itself situated in a convenient location connecting the European continent with Scandinavia. With one of Denmark's longest coastal stretches the water of the Baltic Sea is never too far away and the area also inhabits lots of beautiful and undisturbed nature.

This South Danish area is also famous for its food related economy which is also a basis for jobs and growth (Guldborgsund Kommune 2018 b).

Danish statistic figures indicate that Guldborgsund is the municipality in the Region Sjælland (Region Zealand) with the most tourists staying overnight with a total of 889 140 nights spent in 2018. The popularity of the municipality may be an effect of its arts, culture and culinary experience offers and its coastal nature (Brandenhoff Hansen 2019).

One of the biggest tourism magnets of the municipality is the area around Marielyst with its holiday houses and long sand beaches (Visit Lolland-Falster 2019 a). Also Guldborgsund's administrative centre, Nykøbing Falster, has several attractions to offer within the city and surrounding area including the historic city centre with its old buildings, different kinds of museums, such as museums about fire, hairdressers and art; as well as a Zoo and an open air centre for experiencing the Middle Ages (Nykøbing F. Turistinformation 2014). Further attractions are, for example, the Fuglsang Art Museum, a Golf and Fun Park, the Marielyst Gokart & Paintballcenter, a crocodile zoo or the Knuthenborg Safaripark which is situated on Lolland close to Guldborgsund (Visit Lolland-Falster 2019 b).

Apart from the main attractions, Guldborgsund possesses over a well-established cycling network throughout the municipality attracting lots of bicycle tourists. Simply getting from A to B or roundtrips such as on the "Paradisruten" around Nysted or the Sundruten starting at Slotsbryggen in Nykøbing Falster is comfortably possible by bicycle. To help the cycling tourists navigating, maps and even phone applications have been developed (Visit Lolland-Falster 2019 c).

### 3.2.3 Employment and commuting

#### Employment

The corporate structure of Guldborgsund Municipality is characterised by a large proportion of SMEs that account for three quarters of the jobs in the private economy. It is estimated that the smallest companies with 1-10 employees account for 40% of private jobs, while the medium-sized ones with 10-100 employees account for 34%. For the Sjælland region as a whole, the corresponding proportions are 37% and 32% respectively, i.e. SMEs are slightly more important for Guldborgsund Municipality than in the neighbouring municipalities of Sjælland.

Many SMEs is doing business in areas such as trade and business services including e.g. accounting, consulting, communications and real estate. Most of these smaller companies produce services that are primarily marketed to other companies - to a large extent in the local area. The largest companies in the municipality, on the other hand, mostly operate in industry, construction and transport.

From 2011 to 2016, employment in the private companies in Guldborgsund Municipality fell by 5.1 %, an equivalent of just over 500 full-time employee jobs. This is a significantly weaker development than in Sjælland Region and the country, mainly due to a major job loss from 2011-2013, where some jobs in trade, transport and industry disappeared in the aftermath of the economic crisis. Since 2013, the development has stabilized with a number of around 12,000 people in employment. The growth in employment seen in the region and the country, however, is unfortunately not yet reflected in the development in Guldborgsund Municipality.

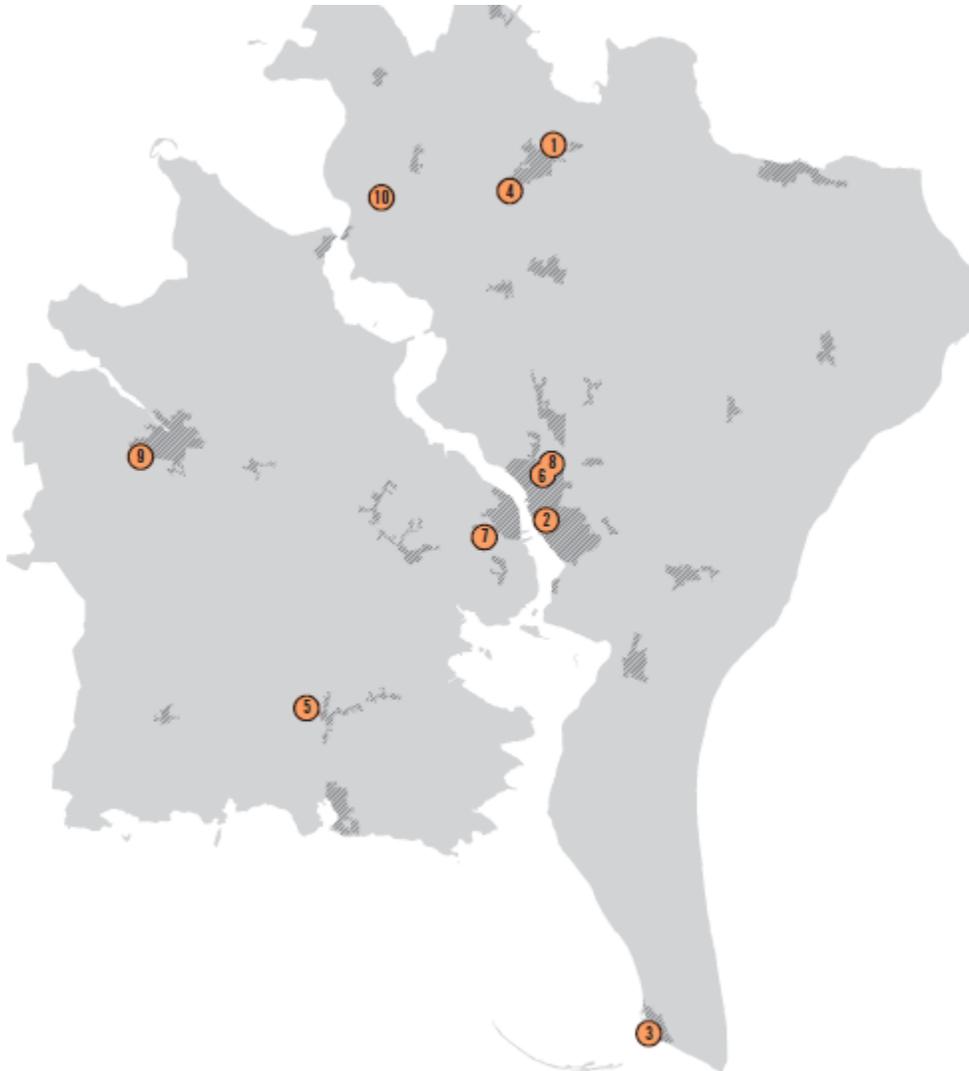
For the past two years, overall employment growth in the private sector in Guldborgsund Municipality has been close to zero. In recent years, employment has generally declined in the trade related economy, whereas and it has increased in Transportation and the category Other Industries (Centre for Vækstanalyse 2018: 9).

**Table 2: The 10 largest business employers**

Number on the map	Company	Number of employees	Sector
1	HARDI International	330	Industry
2	Nordic Sugar	180	Industry
3	Scandlines	160	Transport
4	Scan Con	120	Business services, etc.
5	Troels Jørgensen A/S	100	Construction
6	Scandinavian Tobacco Group*	100	Industry
7	Raaco	90	Industry
8	BO-HUS	70	Construction
9	Sax-Trans	60	Transport

10	MSE Enterprise	60	Construction
----	----------------	----	--------------

Despite the economic structure of predominantly SMEs, the municipality houses several larger companies with 60 or more employees. The largest of them are HARDI International (330 employees), Nordic Sugar (180) and Scandlines (160). The 10 largest companies (see Table 2) primarily operate within industry related fields, building, civil engineering and transport. A spatial distribution of these companies is depicted in Figure 36.



**Figure 36: The 10 largest enterprises within Guldborgsund Municipality (Centre for Vækstanalyse 2018: 6)**

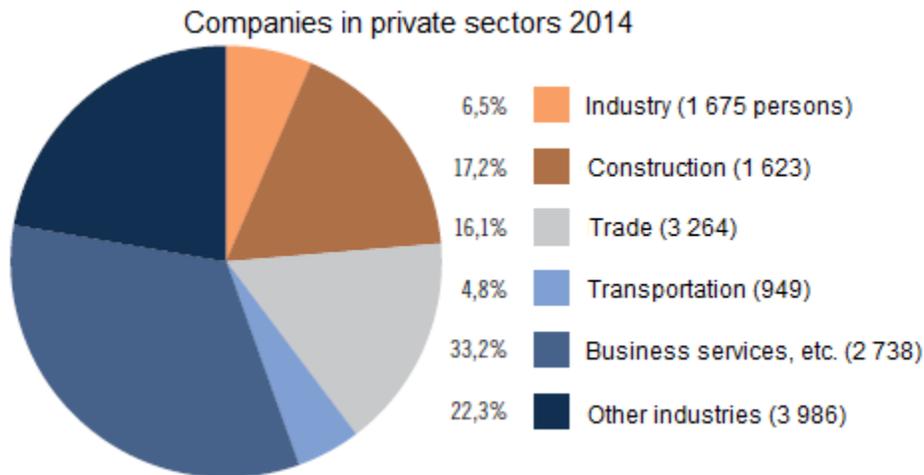


Figure 37: Private companies by sector 2014 (Centre for Vækstanalyse 2018: 7)

Although Business Services is the branch with the highest number of companies with a stake of 33.2 %, it only accounts to 19.2 % of the employment in Guldborgsund municipality. Trade and other, not further specified, industries, contribute even higher stakes of employment with 23 % and 28 % respectively. Concrete numbers of companies and employment distinguished by sector can be seen in Figure 37 and Figure 38.

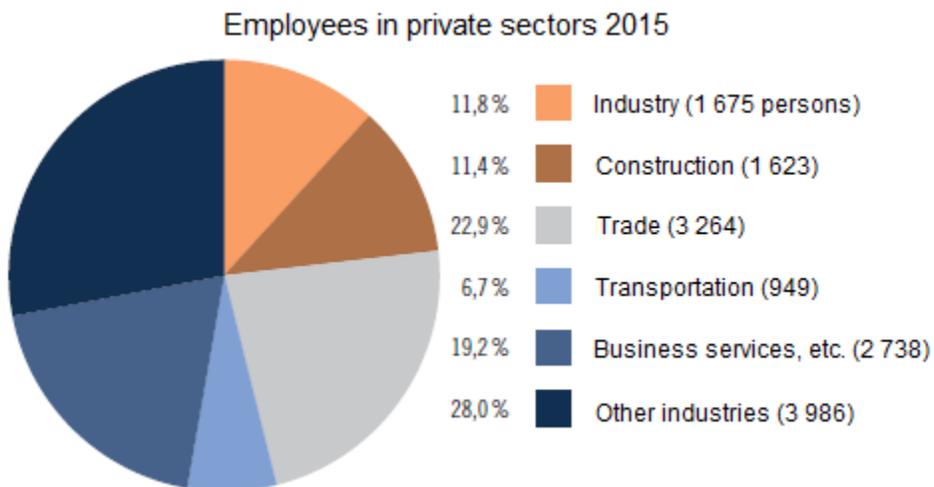


Figure 38: Employees of private companies by sector 2015 (Centre for Vækstanalyse 2018: 7)

### Commuting

18% of employees in Guldborgsund Municipality commute to other, mostly neighbouring municipalities. Some of them, however, commute to work in the metropolitan area of Copenhagen. A calculation indicated that around 17 000 people live and work in Guldborgsund Municipality, whereas 7 000 people commute to work from other municipalities. These numbers

also depend on the sectors; Figure 39 shows the differences. The highest proportion of commuters from outside to Guldborgsund Municipality exists among employees of industrial companies and those employed in the public sector (Centre for Vækstanalyse 2018: 13).

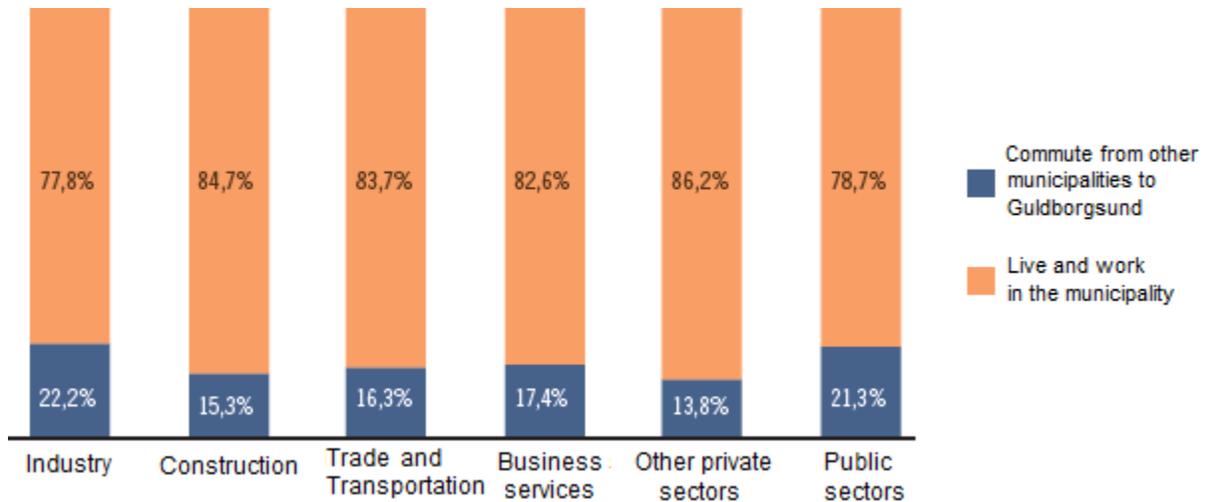


Figure 39: Employees per sector and commute (Centre for Vækstanalyse 2018: 15)

Among the approx. 22 800 people who work in Guldborgsund Municipality, 4 200 (18.4%) commute to work from outside Guldborgsund, mostly from the municipalities of Lolland and Vordingborg. It was observed for the national level as well as for Guldborgsund that the higher the level of education of a worker, the more likely further commutes to work become (Figure 40).

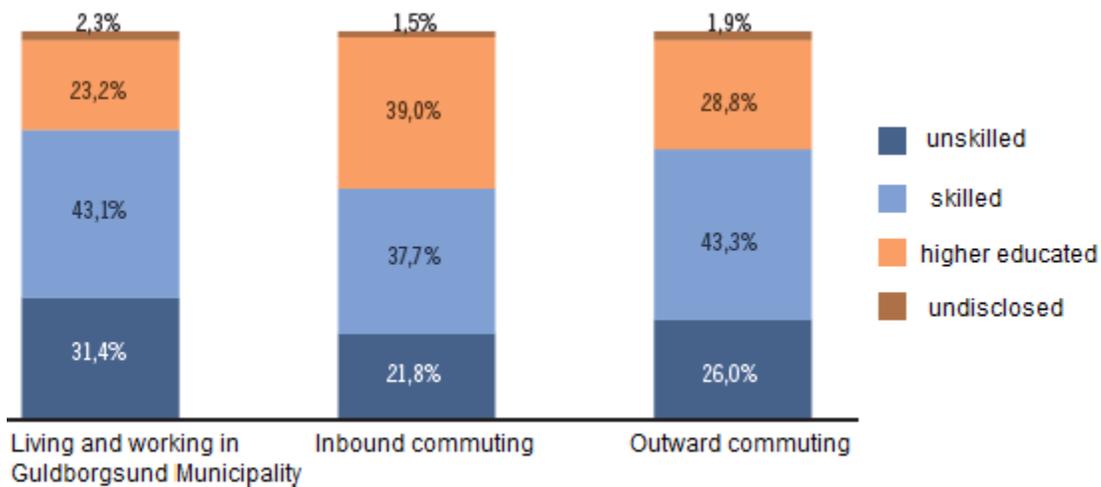


Figure 40: Employees by commuting and education/training (Center for Vækstanalyse 2018: 15)

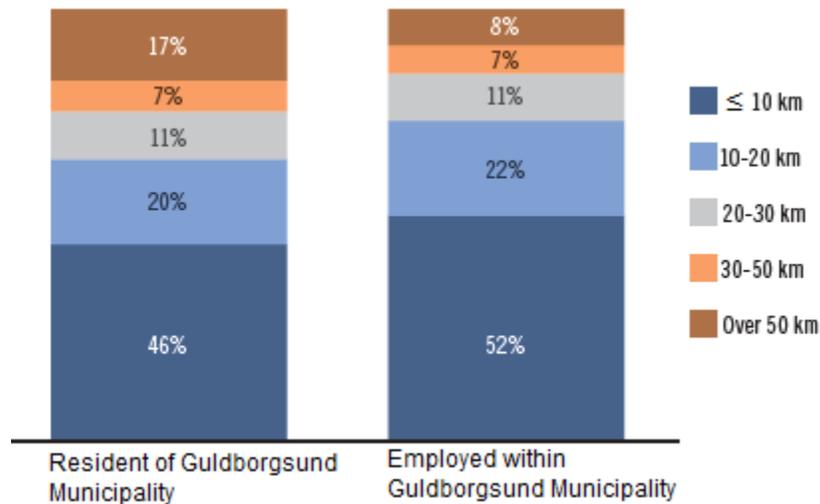


Figure 41: Commuting distances to workplaces (Centre for Vækstanalyse 2018: 17)

As illustrated in Figure 41, most of both working (52%) and residing (46%) in Guldborgsund have an equal or less than 10 km commute to their workplace. About 17% of those employed in Guldborgsund Municipality have more than 50 km to their workplace. Among those working in Guldborgsund municipality, 8% have more than 50 km to work (Centre for Vækstanalyse 2018: 17).

### 3.2.4 Public transport

In Guldborgsund Municipality, the regional transport strategy is prepared and implemented by the Region Zealand. Together with the Ministry of Transport and Guldborgsund Municipality, investments in public transport are coordinated. The operation of public transport activities is mainly done by the stakeholders DSB, Movia, Lokaltog and Scandlines. The Road Directorate of Guldborgsund Municipality is the entity responsible for developing pedestrian and bicycle transport. The users of public transport can retrieve their travel information from the ICT provider Rejseplanen.dk (Jagielło & Wojtach & Łuczak 2018: 35-36).

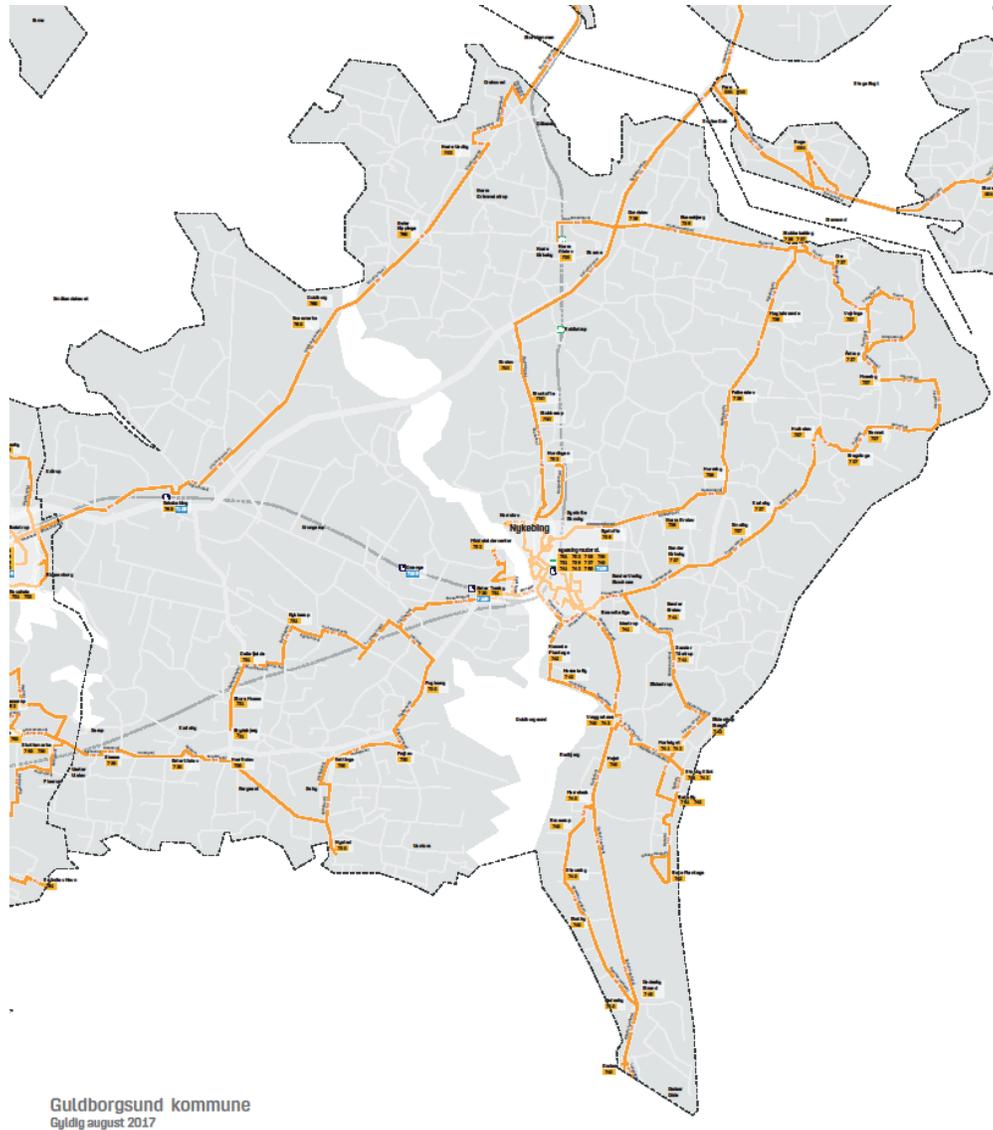
The public transport provider Lokaltog is a private company operating a train line from Nykøbing Falster to Nakskov (Lolland) with hourly departures connecting Lolland with the four following stops in the municipality of Guldborgsund: Nykøbing F, Ø. Toreby, Grænge and Saksøbing (Lokaltog 2019).

The DSB (Danske Statsbaner) is a state-owned railway organisation operating the train line in Guldborgsund which runs from København (Sjælland) to Rødby Færge (Lolland) via Næstved

and Nykøbing Falster. Besides Nykøbing F., this train line includes the connection of the following stops in Guldborgsund Municipality: Nørre Alslev and Eskilstrup. The frequency of departures is about twice per hour between København and Nykøbing F. and bi-hourly between Rødby Færge and Nykøbing F.

Scandlines is a company partly owned by the Danish state; it is operating the ferry between Rostock (Germany) and Gedser (Denmark) and thus important for cross-border transport.

The main public transport provider in Guldborgsund Municipality is Movia, Denmark's largest traffic company, operating throughout Zealand Region. The organisation is owned by 45 municipalities and two regions in Zealand. The tariffs for public transport are set by Movia in collaboration with the DSB, the Metroselskabet and the Danish Transport and Construction Authority. In total Movia transports 215 million passengers annually with almost 450 bus lines, 9 local train routes and five schemes with flexible on demand traffic. In Guldborgsund Municipality, Movia is responsible for operating several bus lines connecting the rather rural parts with smaller settlements with the larger ones, with mostly Nykøbing F. as their main central and final destination (Figure 42) (Movia 2019).



**Figure 42: Movia bus lines in Guldborgsund Municipality (Movia 2017)**

Movia's budget of just over DKK 4 billion annually is almost covered by 50 % by ticket revenue from passengers, while the other half is subsidy by municipalities and the regions.

Based on the municipalities and regions' traffic orders, Movia handles the provision of bus operations and driving arrangements, the so-called Flextrafik, for private operators. Movia's traffic planning then ensures that bus and local rail operations are best connected across municipal and regional boundaries and across different modes of transport with a focus on efficient transport and accommodating the special (health related) needs of its citizens (Movia 2019).

### 3.2.5 Conclusion and recommendations

This section concludes the thematic study on Guldborgsund by adding insights from Jane Errebo, a representative of Guldborgsund Municipality, a main stakeholder of public transport organisation of the area. The answers to the questions on both local/regional and cross-border public transport were based on the respondent's own knowledge and experience.

Cross-border wise, public transport is referred to the Rostock (Germany) – Gedser (Denmark) axis, i.e. the ferry connection operated by Scandlines between the two cities. The respondent states that the ferry connection mainly serves the user groups of business travellers and tourists including one-day-visitors, pedestrians and cyclists. Speaking about the modal split, it is stated that most are traveling by cars (55 %), followed by bus passengers (34 %), foot passengers (6.6 %) and cyclists (3 %). North-bound tourists are believed to be interested in seeing Scandinavia – including the other countries such as Sweden and Norway; many tourists also aim at visiting the local beaches and staying in the summer houses of Guldborgsund Municipality. South-bound travellers, on the other hand, are often interested in tax-free border shopping as well as in seeing Eastern Europe and places such as Rostock or Berlin.

Errebo furthermore states that public transport has the potential to be used more often, but the main user groups refuse to do so, since better possibilities, i.e. a train connection from the municipality's capital to Gedser, are lacking and the frequency of buses may not be sufficient for many people. The respondent therefore suggests introducing more flexibility, e.g. of bus services, to attract more passengers. Improving public transport between Nykøbing F. and Gedser has been proven to be difficult though, since a limited user number and thus a lack of cost-effectiveness and economic viability, hinder the unlocking of further investments.

Regarding the local, municipality-wide, level, it is estimated that the public transport by buses mainly serves the target groups of commuting pupils and students followed by the group of people that cannot drive or do not have a car as well as by tourists. A large majority of pupils/students (80 %) is in fact using buses whereas only the remaining 20 % are believed to use other modes of transport such as cars and bicycle. Most frequented bus destinations therefore include the municipality's capital of Nykøbing especially for educational and consumption (i.e. shopping-) purposes.

The train traffic, on the other hand, mainly serves the target groups of commuters to/from work followed by tourists and business travellers. A majority of commuters (55 %) is in fact using trains whereas the remaining 45 % are believed to use other modes of transport such as cars

and bicycles. Most frequented train destinations therefore include commuting targets such as in the economically stronger regions of Zealand and the metropolitan area of Copenhagen. Tourists mainly use trains to visit the area; mostly to further continue to touristic centres such as the beach resort Marielyst.

Figures suggest that the trains are slightly more important than buses considering the number of transported passengers. While buses transport around 1 100 000 passengers, trains transport more than 1 500 000 passengers per annum.

However, it is believed that the potential for using public transport is higher than the current level of utilisation. As one respondent notes, interconnections between different modes, such as bus and trains are often “not satisfactory”. The frequency of departures is seen as another hindrance for an increased use of public transport when only few connections per day are available particularly from the rural areas to the towns.

Regarding the existing framework conditions, a respondent highlights a lack of possibilities for employers to e.g. stimulate an enhanced use of public transport since “The offer of PT is very different from area to area – in some areas there is no PT at all”. Travellers therefore have “no other opportunity than go[ing] by car”. Public transport operators are currently working on improving the framework conditions to provide better services though. For example, the DSB is upgrading the train connection to and from Copenhagen, to improve travel speed. This, however, reduces the capacity of the connection during the construction works, i.e. with too many people on fewer trains. Although buses take over some destinations, monetary constraints hinder the appliance of even more buses. The respondent further uttered a need for better cleanliness since there is often waste at railway and bus stations polluting the public waiting rooms.

Errebo further notes that by operating the current public transport network, that certain framework conditions exist that have been established by the public authorities. These include providing the transport services for enabling its inhabitants to e.g. live outside the towns and to create the possibilities for the pupils/students to reach their places of education.

The potential for improving the public transport in Guldborgsund Municipality includes “better connections between bus[es] and train[s], more flexibility for the users [and] more departures in the rural areas”. On the employer side, it may be a solution to subsidise PT tickets to support commuting by public transport. Public transport operators should furthermore work on more competitive pricing schemes and more frequent departures during the day, particularly in the

rural areas. Also, possibilities for taking a bicycle on the journey as well as more flexible on-demand public transport may be helpful. Waiting rooms shall be comfortable with cleaner space and Wi-Fi could be offered in all the buses and trains.

Improved public transport may then further benefit the municipal region by e.g. creating transport related jobs, bringing the different areas closer together and allowing people, especially the older generations, to keep on leaving in the rural areas.

### 3.3 Blekinge (Sweden)

Blekinge is in the south of Sweden at the Baltic Sea. It is surrounded by Skåne in the west and Småland in the north. As one of the smallest provinces of all Sweden its coastline stretches over approximately 130 kilometres. Blekinge’s north-to-south extension expands over only 40 kilometres, its west-to-east extension reaches 110 kilometres. With ca. 52 inhabitants per square kilometre, the population density of Blekinge is almost twice as high as the Swedish average (24/km<sup>2</sup>). The naval port of Karlskrona, Blekinge’s capital, is an UNESCO world heritage site. In the 17<sup>th</sup> century, when Sweden was a European major power, the southern province was of great importance due to its strategic location and proximity to the Baltic Sea. From west to east, Blekinge consists of the municipalities Olofström, Sölvesborg, Karlshamn, Ronneby and Karlskrona. Besides historical and cultural attractions, Blekinge is famous for its nature and coastal line, making it a popular travel destination for tourists.



Figure 43: Google Maps (2019): Blekinge province

Currently, the province of Blekinge aims to increase its allure with the campaign “Attractive Blekinge” which is composed of the four main pillars 1) the image of Attractive Blekinge, 2) Quality of life, 3) work life and 4) accessibility. Launched in 2014, the agenda’s aim is to increase the province’s overall attractiveness until 2020. Its unique coastline and archipelago character already contribute to Blekinge’s appeal. By 2020, however, authorities plan to have expanded the business environment as well as invested in businesses of the environment sector and, thus,

greatly expand sustainable development. Blekinge region authorities and decision makers have recognized that environmental and climate issues are a driving force for development. The project “Krafttag Blekinge” is devoted to the improvement of the business environment in the region. This cross-border joint project was started in 2008 and brings the County Administrative Board of Blekinge, all municipalities of Blekinge and the municipalities of the northeast region Skåne at one table. In 2015, the innovation strategy of Blekinge was launched. This agenda tries to implement conditions that facilitate the growth and development of sustainable businesses as well as the region. Moreover, it is planned to invest in SMEs of emerging branches that also promise to have a massive growth potential. (European Commission 2019) Blekinge is also home to the Blekinge Institute of Technology that has a focus on IT-related issues as well as sustainability.

### 3.3.1 Population

As of the first quarter of 2019, the province of Blekinge had approximately 160.000 inhabitants. The capital and the surrounding area is the municipality with the most inhabitants, around 66.000. This is followed by Karlshamn (32.000) and Ronneby (29.700). Sölvesborg (17.500) and Olofström (13.550) have the fewest inhabitants. (Karlskrona Kommun 2019) The graph in Figure 44 indicates a slight increase of Blekinge’s inhabitants in the time span of 2014 – 2018. Compared to 2014 Blekinge’s overall population has increased by almost 6 000 people.

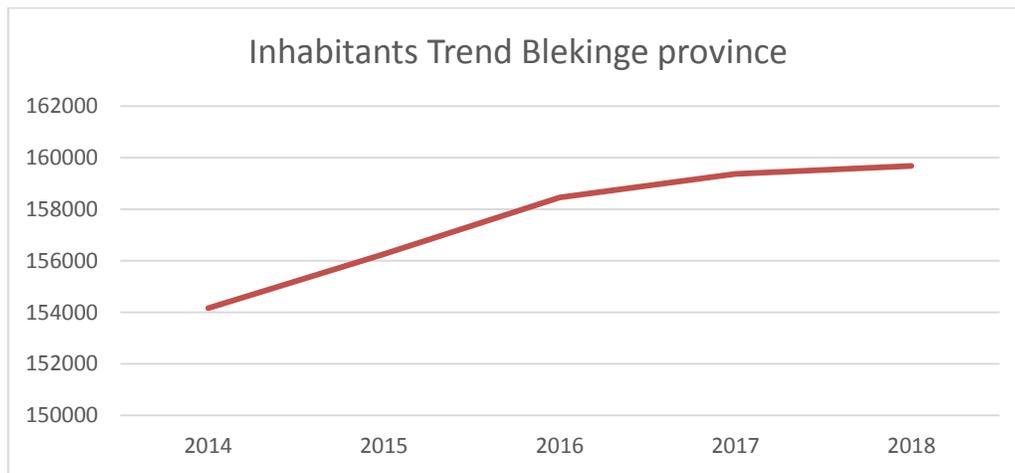
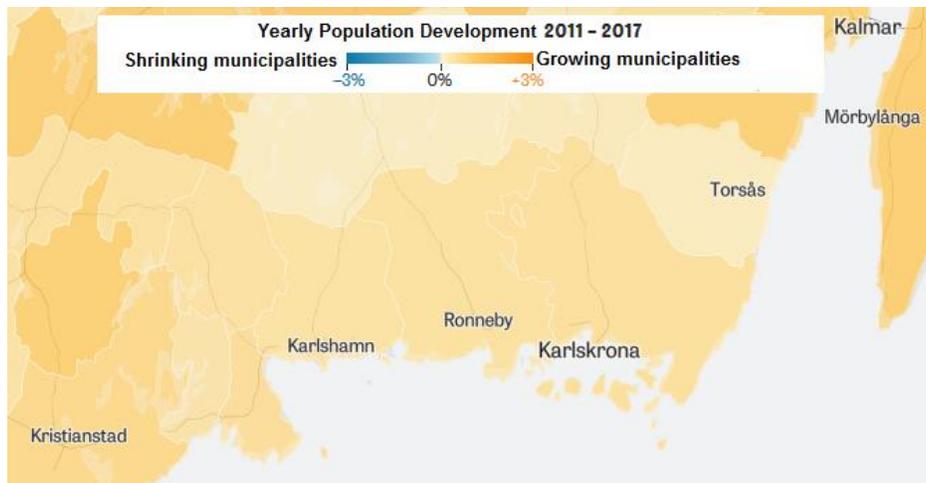


Figure 44: Blekinge province inhabitancy trend 2014-2018 (UrbiStat 2018a)

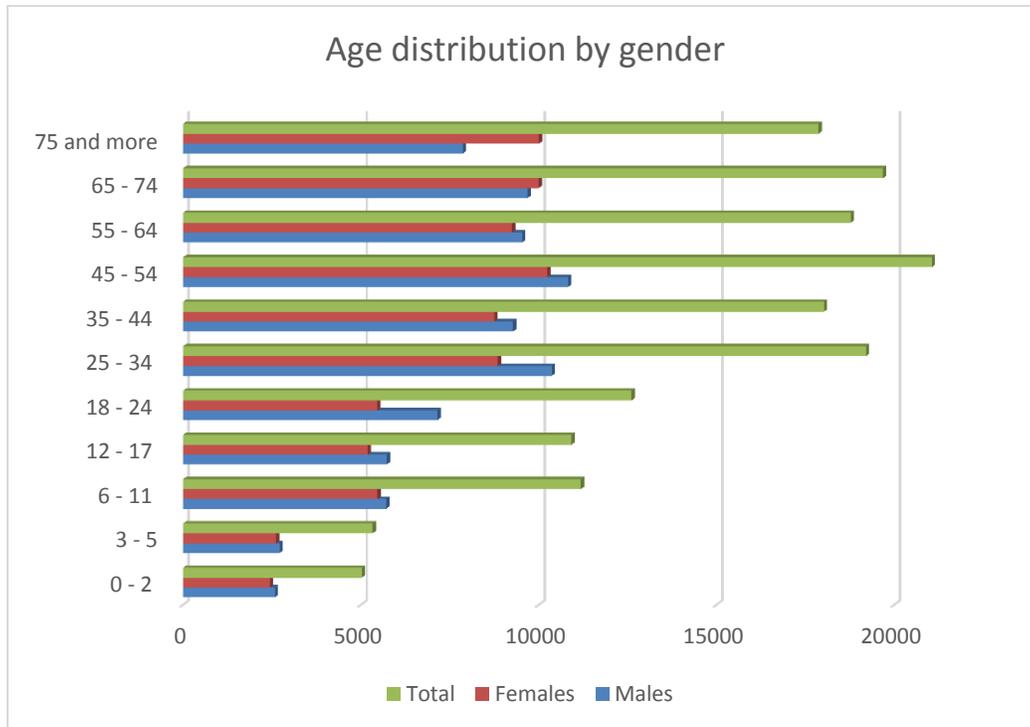


**Figure 45: Blekinge population development 2011 – 2017 (Blickle et. al. 2019)**

Figure 45 is taken from a survey conducted by the German Federal Institute for Research on Building, Urban Affairs and Spatial Development. It vividly shows that Blekinge province belongs to the regions that have been very slightly growing over the last years, yet there are regions in Sweden that have witnessed a much more substantial increase in population numbers. An OECD survey conducted in 2019 confirms the trend that, Blekinge, together with neighbouring provinces Kalmar, Kronoberg and Jönköping, has recorded a slight increase in population over the last years. The mainly rural counties still face the issue of a population decline though it is not as severe as it was in 2012. (OECD, 36)

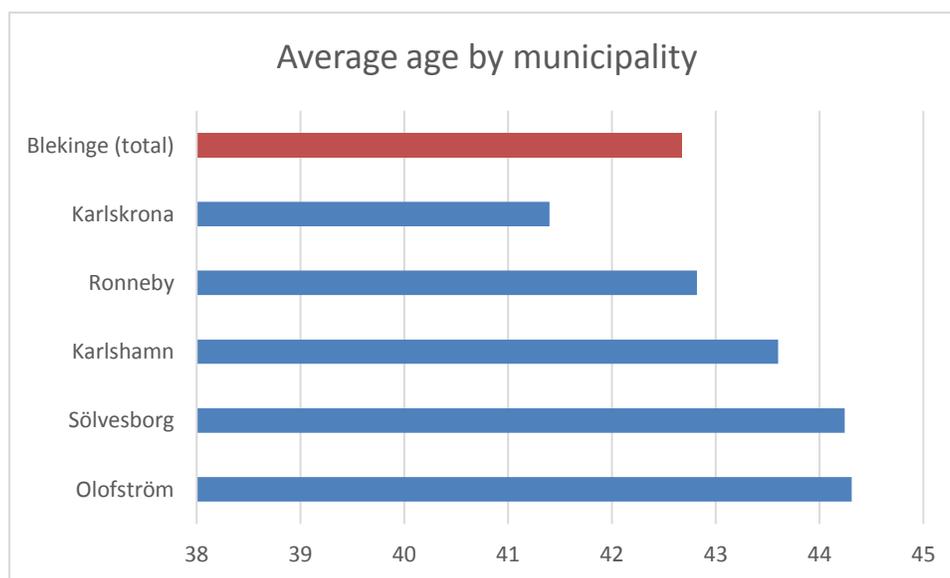
### **Aging Population**

Like its neighbours, Blekinge also faces the problem of an ever-ageing population. The OECD survey from 2019 disclosed that the average age increased over the time span from 2012 to 2017. The average age of Blekinge's population is 42 years. Elderly people make up a substantial part of the overall population. (OECD 2019, 37) (Figure 46)



**Figure 46: Blekinge province age distribution by gender, Blekinge province (UrbiStat, 2018b)**

As shown in Figure 47 Karlshamn, Olofström and Sölvesborg significantly exceed Blekinge's average age and are the oldest municipalities while Karlskrona is by far the youngest of all Blekinge.



**Figure 47: Average age in municipalities of Blekinge province (UrbiStat, 2018c)**

The overall development of an aging society is also reported in the province of Blekinge. Though the population of Blekinge was not as old as in neighbouring municipalities, the trend of an aging population is undeniable. The municipality of Karlskrona is still among the younger ones, probably because of its status as capital, the presence of many businesses and the influx of younger people preferring urban areas.

With a demographic situation as diverse as the one of Blekinge, it is necessary to adapt the region's public transport system in order to meet the requirements of younger and older inhabitants as well as tourists. According to Blekinge region, pupils up to high school can use public transport free of charge. They mostly travel by bus between their place of residents and their schools in the mornings and afternoons. Students aged over 18, however, have to acquire public transport tickets – they most commonly commute by car. Those who have a car or can drive one prefer traveling by car because it is easier and more flexible. The longer traveling takes, the more less comfortable train compartments or lacking information about public transport possibilities present obstacles that demotivate students from using public transport. Since Blekinge's demography is characterized by a high proportion of elderly people, public transport development must consider their special needs. Elderly people or people with disabilities use the public transport mainly to visit the municipalities' city centres for shopping and dining, for other entertainment purposes or to receive medical treatment in one of the hospitals, which are mainly located in and around the centre of Karlskrona, in the city centre of Karlshamn or in Sölvesborg. Their main traveling times might cover the entire day and cannot be certainly fixed to one part of the day. Although many elderly people are used to go by car and are, thus, hesitant to switch to public transport, there are also elderly people who do not own a car and prefer the more comfortable way of traveling by train, bus or ferry. Also, people with disabilities, that do not own specially customized cars suitable for their needs, prefer public transport as it is mostly accessible to people with impairments.

### 3.3.2 Tourism

The province of Blekinge offers a vast array of possibilities for tourists to experience. Tourists can explore the historical naval base of Karlskrona that was declared UNESCO world heritage, discover the archipelago with its scores of little islands and skerries, go fishing, hiking, golfing or visit museums and vineyards. Anglers like the Blekinge waters, which are rich in fish, especially

the river Mörrumsån. Blekinge runs its own tourism branding ([www.visitblekinge.se](http://www.visitblekinge.se)) that is quite successful and recognized. Blekinge's landscape is characterized by a lush archipelago with picturesque islands and skerries. As the sea off the shore of Blekinge is ice-free all year, tourists can enjoy Blekinge's characteristic landscape all year long. The cities invite for extensive shopping tours as well as guided tours through their historic districts. The landscape of every municipality can be explored on foot, by bike, via boat, bus, car or train. However, there are also some specific attractions to each municipality. Blekinge's southwestern municipality Sölvesborg, for example, is famous for staging the Sweden Rock Festival that welcomes almost 35 000 visitors every year, and the Hällevik's Tradjazz Festival. The offshore island Hanö belongs to Sölvesborg and attracts 40 000 visitors every year. Sölvesborg is also home to one of Sweden's most excellent golf courses and has one of Sweden's largest beech forests. The western municipality of Olofström is famous for its lake scenery consisting of about 200 lakes. Due to famous authors having worked or lived in Olofström, it is also called the district of authors. A couple of museums and the so-called "Author's Village" pay tribute to the region's authorial past. Karlskrona's historical city centre as well as its peninsular character attract many tourists every year. (Visitblekinge, 2019) Moreover, the ARK 56 is a network of coastal trails in a UNESCO biosphere reserve close to Blekinge's capital that can be explored on foot, by bike, on a kayak or by boat. A specifically designed smartphone application helps visitors to find their way to the best trails and suggests tours through the area. (ARK56, 2019)

Blekinge's landscape, historical sites and cultural events offer a lot of attractions for both tourists and leisure travellers. In Karlskrona city centre the number of tourists has been increasing for many years. These are mainly from countries close to Sweden such as Denmark, Germany and Poland but also from other parts of the world. The ferry connection between Gdynia and Karlskrona is particularly important to increase the number of visitors from Poland. Mostly during the evenings or on the weekend, leisure travellers visit the shopping and dining sites in the city centres or attend cultural or sports events. During the summer, the beaches and hiking areas are also frequented by leisure travellers. Leisure travellers value the sustainability of public transport methods in Blekinge. Tourists and business travellers, especially those arriving in the region by car, often prefer to use it for intraregional travels. Yet, the good connections between the municipalities' city centres present a significant competition towards the use of a car, especially when there is free Wi-Fi and additional space to work while traveling.

## Cross-border mobility

The already mentioned OECD survey conducted in 2019 has recorded an improvement in public traffic compared to 2012. Thus, it was stated that the province of Blekinge put emphasis on the implementation of renewable fuels in its public transport system. Moreover, the environment is protected by the development of new bike lanes. According to the report, over the last five years the province of Blekinge has shown a shift towards internal mobility. Cleaner modes of transportation have become more frequent and thus increasingly replace trains and privately used cars (OECD, 2019, 90).

From continental mainland Europe, there are various possibilities to get to Blekinge. The province can be reached by ferry (DFDS Seaways) from Lithuania, via Stena Line from Gdynia (Poland) or via motorway and a short ferry trip from Germany. Additionally, from Stockholm it is only about 50 minutes to Ronneby via plane to the airport in Blekinge. The connection between Gdynia and Karlskrona is one of Stena Line's most strategically relevant, both for freight and passengers. Evidently, Stena Line has an interest in the development of the region and cooperates with each municipality's harbour its ferries frequent. There has been a growing demand for more freight capacity over the last years. As shown in Figure 48, the numbers of goods and cars transported by Stena Line on the connection between Karlskrona and Gdynia has increased tremendously over the last two decades. Thus, big investments have been made by adding more and bigger vessels in order to increase the capacity. The infrastructure and sustainability have also been improved by these investments. On both sides, Karlskrona and Gdynia, there is a strong demand for leisure travel. Like the numbers for goods and cars transported on this connection, the numbers for guests using the ferry to go in one direction or another have increased almost sevenfold. (Figure 48).



Figure 48: Stena Line: Karlskrona - Gdynia, Development of Freight / Cars volumes



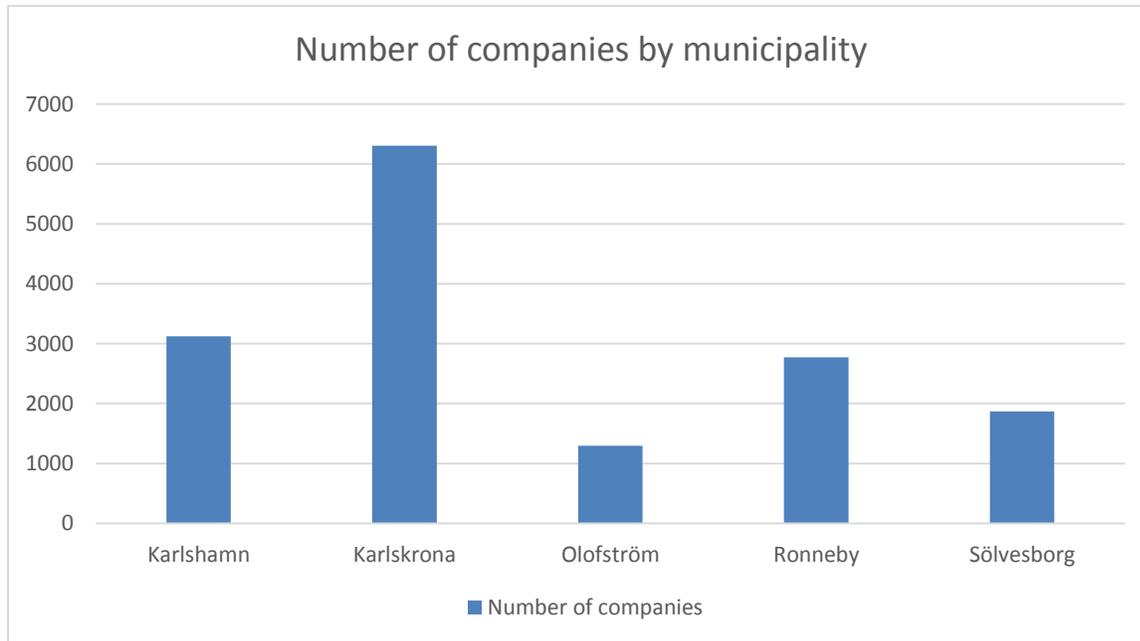
Figure 49: Stena Line: Karlskrona - Gdynia, Development of Guest's Volumes (1995 - 2017) (Stena Line, 2018b)

### 3.3.3 Employment and commuting

Blekinge province has a relatively large public sector and industry, however, in comparison to other Swedish provinces its service sector is small. The service sector is most developed in the municipalities of Karlshamn and Sölvesborg, where companies serve private households, and in the capital Karlskrona, where a lot of businesses are located. Additionally, the public sector of

Karlskrona and Ronneby is larger than in the other municipalities. This is because many governmental institutions, including the Swedish Armed Forces, are in these eastern municipalities. On the other hand, Sölvesborg and Karlshamn have a substantial health and social sector. In Olofström, Sölvesborg and Ronneby industry plays an important role. The auto industry, the manufacture of electronic products, rubber and plastics industry, the metal and the engineering industry the most relevant industries for the province of Blekinge. Blekinge was one of the Swedish counties which suffered the most because of the financial crisis. Thus, the youth unemployment is still very high, in fact it is one of the highest in all of Sweden. (EURES, 2019)

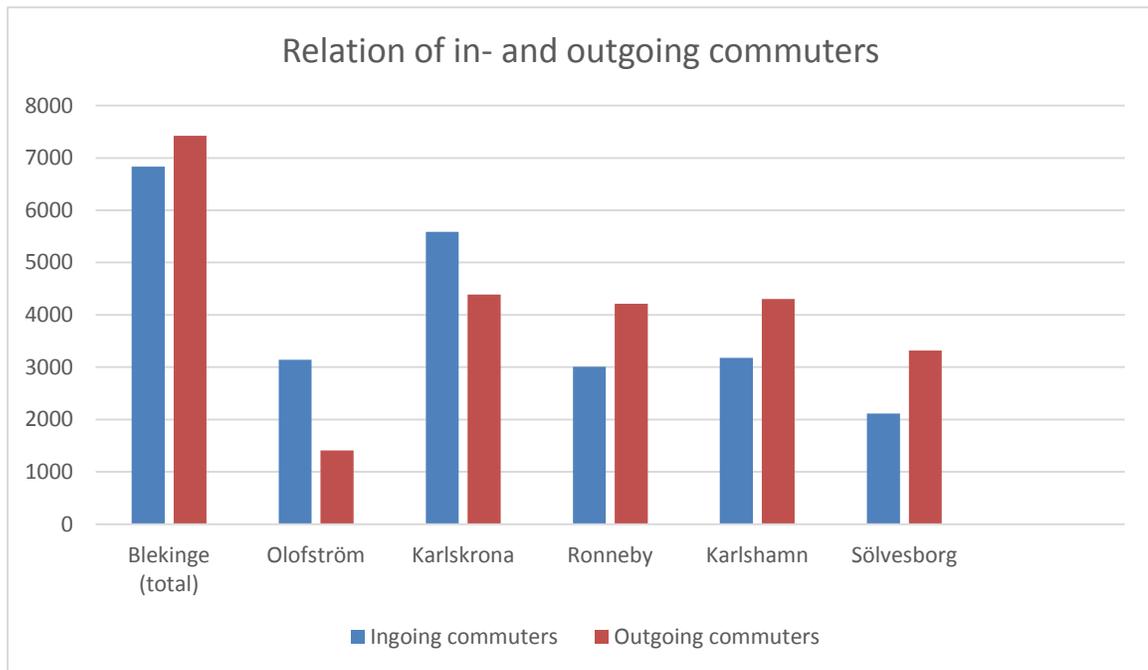
The port of Karlshamn belongs to the larger ports in Sweden and it has attracted companies from the food and logistics industry, such as Aarhus Karlshamn, ABU Garcia or Södra Cell. Pertaining the development of digital media as well as intelligent transport and energy solutions, the Blekinge Institute of Technology has, together with many companies, formed the Net Port Science Park. According to its website, the Science Park “creates sustainable growth and community development by promoting collaboration between the business community, academia and the public sector.” (Net Port Science Park, 2019) This can be considered a research and workplace that attracts people from all Sweden and beyond. The capital of Blekinge, Karlskrona, is home to many IT-related and telecom companies, such as Ericsson and Telenor. Moreover, companies from all sorts of branches, including Marine Technology, Telecom, High tech Industry, ICT, Logistics, Shipping, Tourism, have settled here. As shown in Figure 50 Karlskrona is home to twice as many companies as in each of Blekinge’s other municipalities. Karlskrona is also home to the Blue Science Park, a research and business centre dedicated to furthering eHealth, Maritime Technology and Digital fields. The western municipality Olofström, on the other hand, is home to the automotive industry, other production industries as well as applied IT. A high percentage of employees (44%) works in foreign companies. (Blekinge Business, 2018) In the municipality of Ronneby, great attention is put on water. The health resort, Ronneby Brunn, uses the natural water resources of the region for healing and regenerating purposes. Additionally, Ronneby is also home to many companies that use water for their business, such as Orbit One, Tarkett and Alfa Laval. The airport of Blekinge located in Ronneby surely helps to develop the region further. The companies located in Sölvesborg are, among others, TitanX, Atria, Stål- och rörmontage and DOT.



**Figure 50: Number of companies by municipality (Blekinge Business, 2018)**

With regards to public transport and the companies located in Blekinge, representatives of Blekinge region have stated that some employers have environmental policies that give advantages their employees when using public transport, however, mostly only during their working hours. There are no subsidies for coming to work using public transport, however there are some when coming by car. Public transport organizers have promoted the idea of yearly tickets for employees but until now this has been used rarely.

## Commuting



**Figure 51: Number of commuters in Blekinge, 2017 (Statistics Sweden, 2018)**

Figure 51 indicates that in the year 2017, there have been around 6.000 ingoing and 7.500 outgoing commuters per working day in the entire province of Blekinge. Except for the municipalities of Olofström and Karlskrona, the numbers for the outgoing commuters have exceeded the number for people coming into the region for work. In the case of Olofström and Karlskrona, more commuters went into the municipalities than out of it. Many governmental institutions are located in Blekinge’s capital Karlskrona that may attract people from other parts. Thus, it is of little surprise that more people have travelled to Karlskrona for work than left the capital in order to work elsewhere. As Olofström is the most western municipality of Blekinge, its traffic connection and proximity to the mainland can be attributed as reasons for the relatively small number of outgoing commuters.

According to the Blekinge region, commuters travel particularly in the mornings and afternoons between their places of residence and their working place. Their main destination are the hospitals in Karlskrona and Karlshamn as well as the manufacturing plants of Verkö in Karlskrona or Volvo in Olofström. Commuters in the Blekinge region prefer public transport because it is comfortable and, compared to traveling by car, cost effective. Those commuters who do not own a car or are not licensed to drive depend on traveling by train or bus, also

because it is a more sustainable way of commuting. Expensive parking fees and limited parking space may also cause commuters to use public transport instead of a car. On the other hand, people commuting within Blekinge, refrain from or minimize their use of public transport because of the extended duration as opposed to the car, the reduced comfortability and their lack of information related to public transport connections.

### 3.3.4 Public transport

There are three major systems of public transport in the province of Blekinge: bus, boat and train. (Figure 52) The public transport system of Blekinge, called Blekingetrafiken, runs public buses in each of the municipalities' central locations and surrounding areas. The express line, served by Coastal Buses, connects Blekinge's central towns with towns outside of Blekinge, namely Kalmar in the northeast and Växjö in the northwest. There is also a coastal boat connection by which one can travel from Karlskrona over Ronneby to Karlshamn and back. Blekinge's municipalities are connected in between by bus and train lines on the mainland and ferries on the sea. Every municipality's centre is connected to its neighbouring municipalities by a bus and train connection. Additionally, the three municipalities of Karlskrona, Ronneby and Karlshamn are also connected by ferry lines. Particularly Karlskrona and its surroundings can be accessed easily through a multitude of connections by sea and land. Travel by bus between the municipalities is possible within at least a one-hour drive. The train, however, represents the main choice of public transport between municipalities and cities along the coastline. The travel time by train from Karlskrona to Sölvesborg, for instance, is 70 minutes, while the nearby city of Ronneby can be reached within 20 minutes and Karlshamn within 48 minutes from Karlskrona.



**Figure 52: Map of Public Transport in Blekinge 2018 (Blekingetrafiken, 2018a)**

The municipality of Karlskrona is quite well connected by bus and boat. Due to the specific character of Karlskrona which spreads over offshore islands and the mainland, it is necessary to provide additional public transport by boat. The ferries are especially attractive for tourists who can use the network of ferries to travel from Karlskrona to the surrounding skerries and islands. Traveling within Karlskrona is conducted by bus and ferry. From the central station of Karlskrona that is located on the most southern peninsula it is possible to visit the islands of Saltö, Langö and mainland Hastö within approximately 12 minutes by buses regularly every 10-30 minutes. The towns of Nätraby, Verkö, Rödeby and Bastasjö, which are further away, can be reached by bus within 25 to 35 minutes. Karlskrona also has a direct connection to Blekinge's airport in the municipality of Ronneby. The drive lasts about an hour and within the week buses go from there all day every 60 minutes to Ronneby airport, from which Stockholm can be reached within 50 minutes. At the weekend this rhythm switches to every two hours, though on Sunday the latest bus leaves at 9 pm. Within the city of Karlskrona a total of 9 bus lines are operated that provide travel across the city from 5 a.m. to 11 p.m. in an average interval of 20-30 minutes. (Blekingetrafiken, 2019)

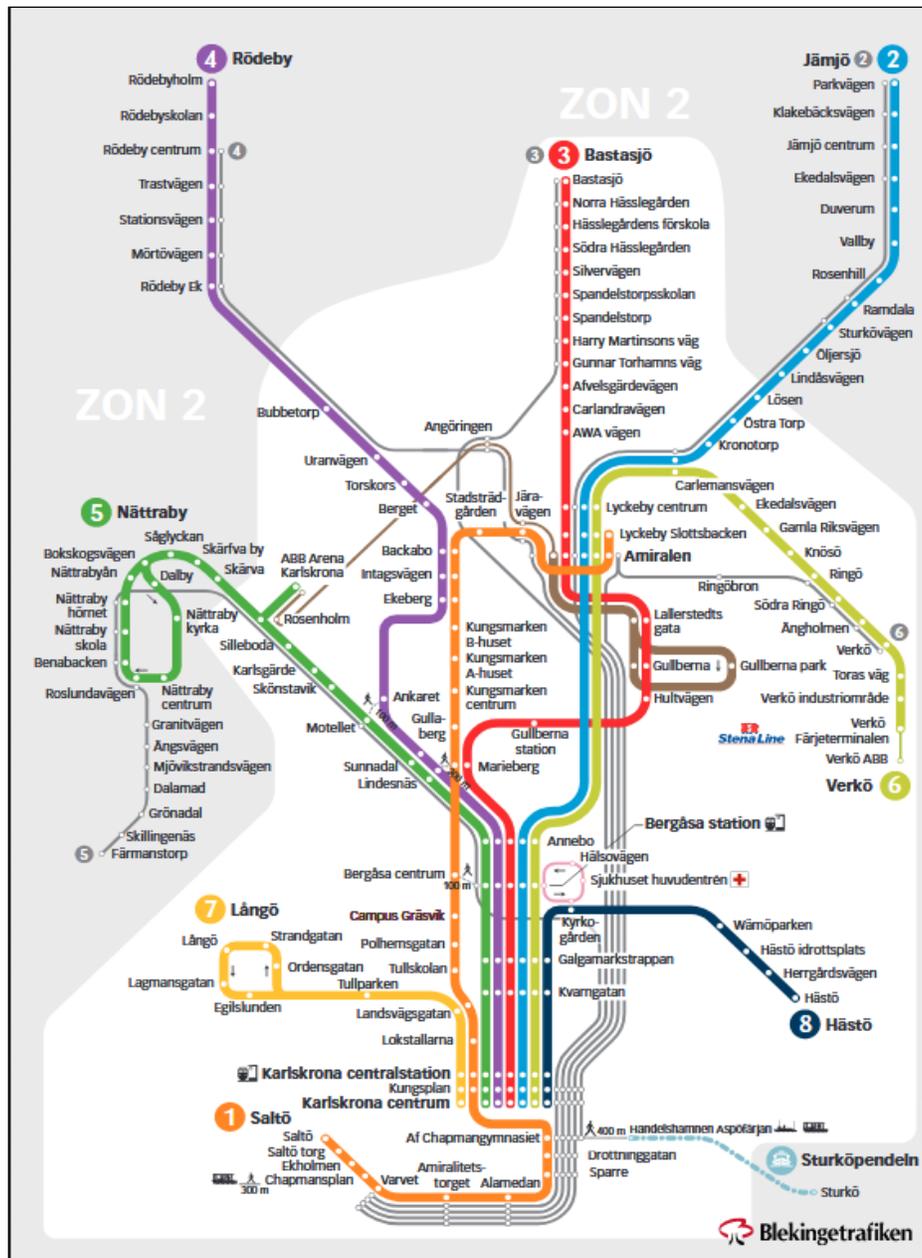


Figure 53: Karlskrona Public Transport Map [Blekingetrafiken, 2018b)

According to authorities of Blekinge region, almost all public transport in Sweden is operated by contract and is subsidized by the municipalities, in average about 50%. This results in a better public transport system for users and lower prices. Public authorities are usually controlled by a political board. The policies are often made in cooperation with other authorities to support the ambitions of the board of the region. This system usually makes the authorities work for a better way of traveling in general in order to decrease the volume of pollution and to make people less

dependent on. Yet, the aim to make the region less dependent on car traffic is also reliant on the traveller itself. Travelling by car is often less time-consuming and parking spaces make it easy and cheap to go by car. Climate change and pending health issues could swing this debate in another direction, making it more feasible to invest in sustainable methods of public transport.

### 3.3.5 Conclusion and recommendations

This section concludes the thematic study on Blekinge by adding further insights from a representative of Blekinge Region, a main stakeholder of public transport organisation of the area. The answers to the questions on both local/regional and cross-border public transport were based on the respondent's own knowledge and experience. The main interest of the questioning was the differing use of public transport of various target groups, namely students, commuters, leisure travellers, elderly or people with disabilities, and tourists as well as business travellers. The questioned representative of Blekinge estimated the share of the various target groups among public transport users as follows. It was estimated that around 35% is made up of students, only commuters with 40% were estimated higher. Beside those two groups, there are 15% elderly or people with disabilities, 8% leisure travellers and 2% tourists. Approximately more than half of all the students (55%) use Blekinge's public transport system. Only around 11% of the commuters use it while 9% of elderly. For the groups of tourists and leisure travellers was no information given. It was further stated that the main reasons for students to use public transport are that they tend to not own a car or a driving license. Compared to private usage of a car or carsharing, the costs of public transport, e.g. the bus, are much lower or in some cases non-existent for students at all. The preference for public transport is much higher when people do not have a car or are able to drive. But even if a car can be used, the costs for parking fees, limited parking space or an awareness for the need to save the environment causes primarily commuters and leisure travellers to switch to public transport. Tourists and business travellers mainly use their car to travel within the region, all the more because they already used the car to get to Blekinge itself. However, due to the excellent connection between the various city centres, according to the Blekinge representative, tourists and business travellers recognize train and bus connections as valid alternatives to going by car. The argument conspicuously often raised against the usage of public transport is that going by car or bike is considered easier and more flexible. This was said to be applicable to all target groups. Additionally, it was stated that the lack of information about public transport routes and connections is an obstacle all target groups face.

Except for commuters mainly travelling between their workplaces and places of residence, all other target groups were said to use public transport to travel to one of Blekinge's city centres. The reasons are manifold and vary from attending classes at university or school (students), to visit shopping and dining sites as well as attend cultural and sports events (leisure travellers and elderly people). Furthermore, elderly and people with disabilities need to go to hospitals. During summer, leisure travellers as well as tourists frequent the beaches and hiking areas. Tourists may also enter Blekinge by ferry from Poland or travel out of the region on their way to Malmö, Copenhagen or Stockholm.

When asked about the current framework conditions of public transport in the region of Blekinge, the representative responded that some employers follow environmental policies which often only cover their employees' travels within working hours. In general, subsidies still apply only to travelling by car instead of using public transport to get to work. According to the representative the situation of public transport operators is that all public transport in Sweden is operated by contract and subsidised by the municipalities, in average about 50%. The role of public authorities in the improvement of the public transport was estimated positive by Blekinge's contact person since it was stated that public authorities have interest in decreasing pollution and making people less dependent on cars, thus supporting public transport. However, the general conditions currently implemented still favour car traffic. Travelling time is much shorter and available parking spaces make it easy and cheap to use the car. According to Blekinge's representative this is a trend that will be terminated when more emphasis is put on climate change and sustainable means of transport to combat health problems as well as save the environment.

The public transport system in Blekinge should be subsidised when tickets for commuting or bicycles are purchased. On the other hand, the subsidies for travel by car should be decreased. Company owners or employers with an environment-friendly agenda should also support sustainable public transport by making it available or more affordable to their employees. In general, a framework of conditions that supports travel with a low impact on the environment and thereby helps to fulfil the goal of decreasing the CO<sub>2</sub>-emission, should be implemented on all levels. Policies that support commuting and other work-related trips by public transport, bike or on foot should be strongly considered and realized. By enhancing the reach and attraction of public transport travelling with public transport can be made much shorter and thus help to render public transport methods more competitive. For example, the case of Copenhagen could be consulted: there, public spaces usually devoted to car traffic demands have been transferred to other ways of travel, thus enhancing the visibility and usage of public transport within the city.

### 3.4 Pomeranian Voivodeship / Tricity (Poland)



Figure 54: Pomeranian Voivodeship (Google Maps, 2019)

Pomeranian Voivodeship was established in 1999 out of the former voivodships of Gdańsk, Elbląg and Słupsk, following the Polish local government reforms adopted in 1998. (Sejm Rzeczypospolitej Polskiej, 1999)

The Pomeranian Voivodship borders with West Pomeranian Voivodship to the west, Greater Poland and Kuyavian-Pomeranian Voivodeships to the south, Warmian-Masurian Voivodeship to the east, and the Baltic Sea to the north. It also shares a short land border with Russia (Kaliningrad Oblast), on the Vistula Spit.

Tricity, or Tri-City is a metropolitan area located in the north-eastern part of Poland, with a total area of 414km<sup>2</sup> and a population of around 750.000 inhabitants, consisting of three cities in Pomeranian Voivodship province: Gdańsk, Gdynia and Sopot. Minor towns in their vicinity also belong to the metropolitan area as they are situated adjacent to one other, following the coast of

Gdańsk Bay. Tricity metropolitan area was officially established in 2007, when presidents of Gdańsk, Gdynia and Sopot signed the “Charter of the Tricity” declaration.

### 3.4.1 Population

The Pomeranian Voivodship has 2 285 500 inhabitants (Eurostat, 2017), of which 51.3% are women and 48.7% are men. In the years 2002-2017, the number of inhabitants increased by 6.4%. The average age of residents is 40.3 years and is comparable to the average age of inhabitants of all of Poland. The forecasted number of Pomeranian inhabitants in 2050 is 2 265 735, of which 1 155 743 will be women, and 1 109 992 men. The Pomeranian Voivodship has a positive natural increase of 5 831. This corresponds to a natural increase of 2.51 per 1 000 Pomeranian inhabitants.

60.9% of Pomeranian residents are in working age, 19.6% in pre-working age, and 19.5% of inhabitants are in post-working age. (GUS, 2017)

Overall, the Pomeranian Voivodship is aging, although slower than the rest of the country. This is confirmed by, among others, by gradual increase in the median age of population and values of demographic old age index or old age index. In 2018, the median age in the voivodship was 39.6 years, compared to 39.0 in 2016 and 39.3 in 2017. Old age demographic ratio (the share of people aged 65 and over in the total population) increased from 15.8% in 2017 to 16.4% in 2018. For 100 people aged 0-14, in 2018 there were 98 people aged 65 and more, where it was 96 people a year earlier. At the same time, the average life expectancy increased in 2018 to 74.8 years for men and 81.7 years for women (74.8 years and 81.7 years in 2017). (GUS, 2018)

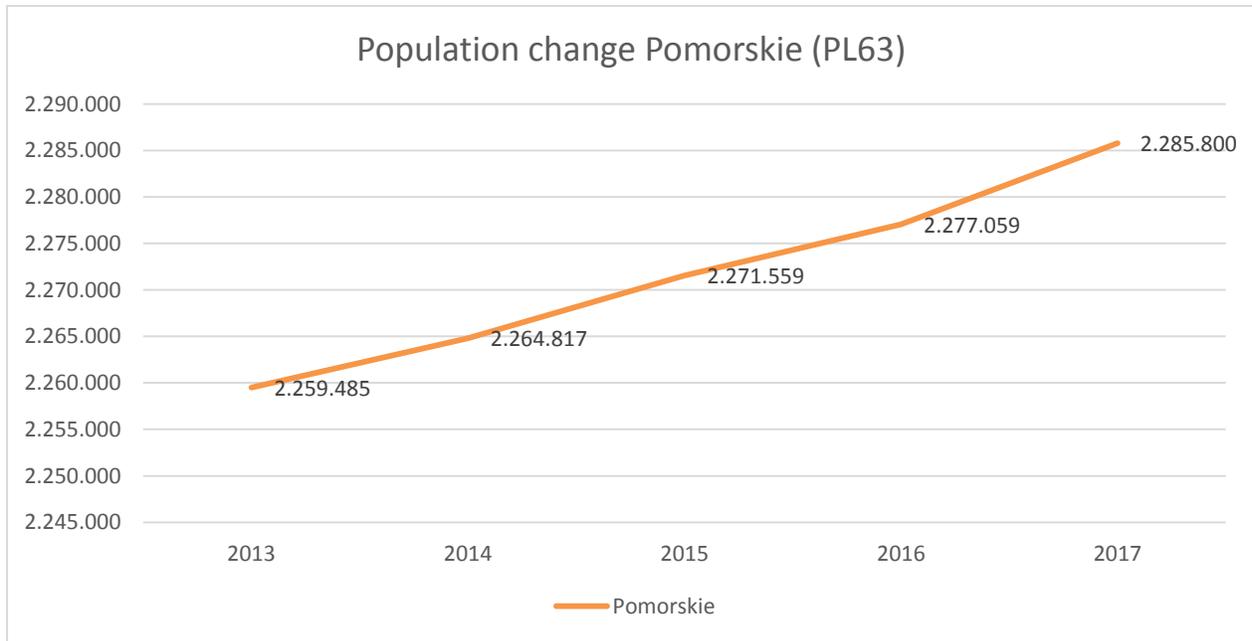


Figure 55: Population Change Pomorskie (PL63) (Eurostat, 2018)

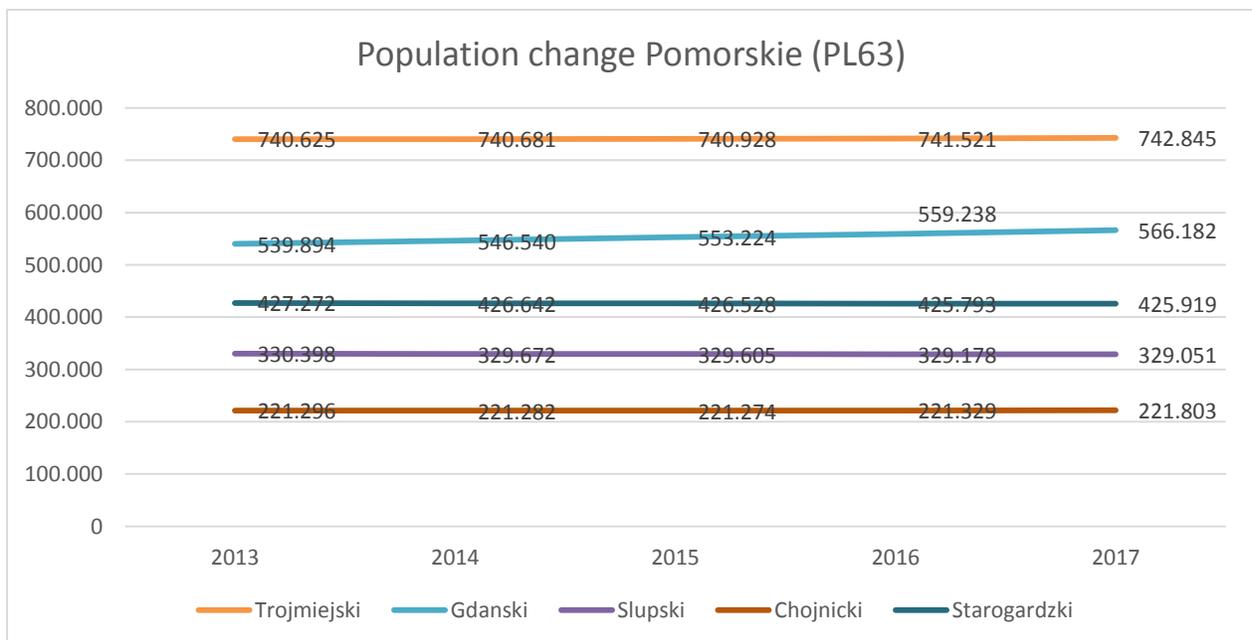
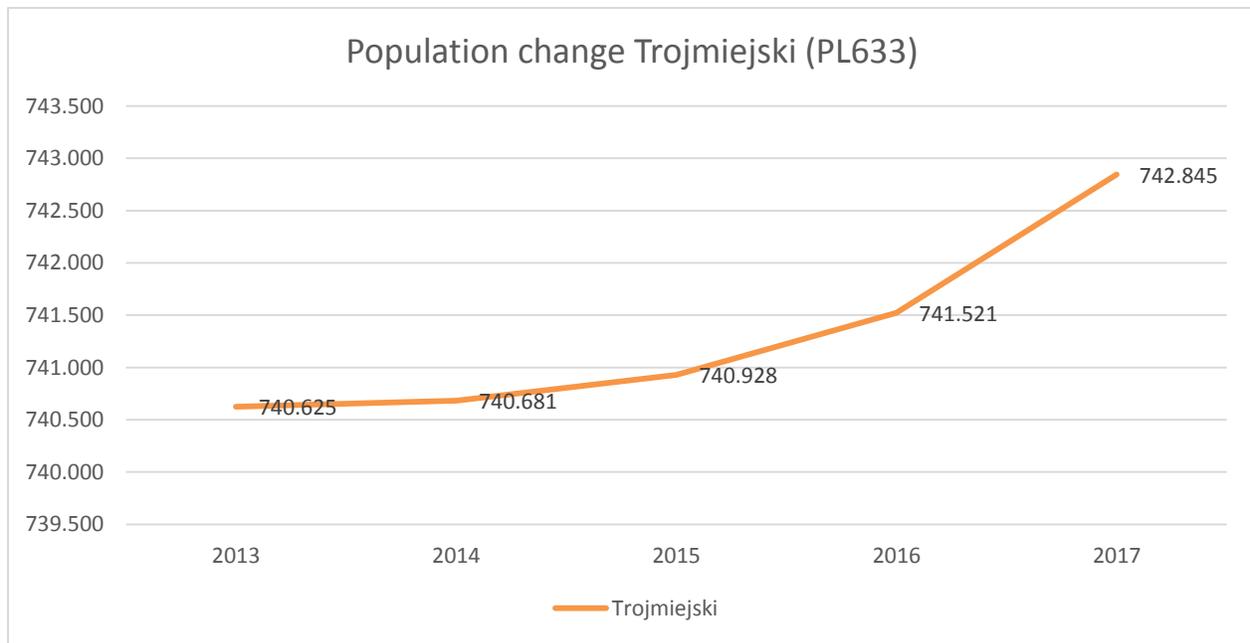


Figure 56: Population Change Pomorskie (PL63) (Eurostat 2018)

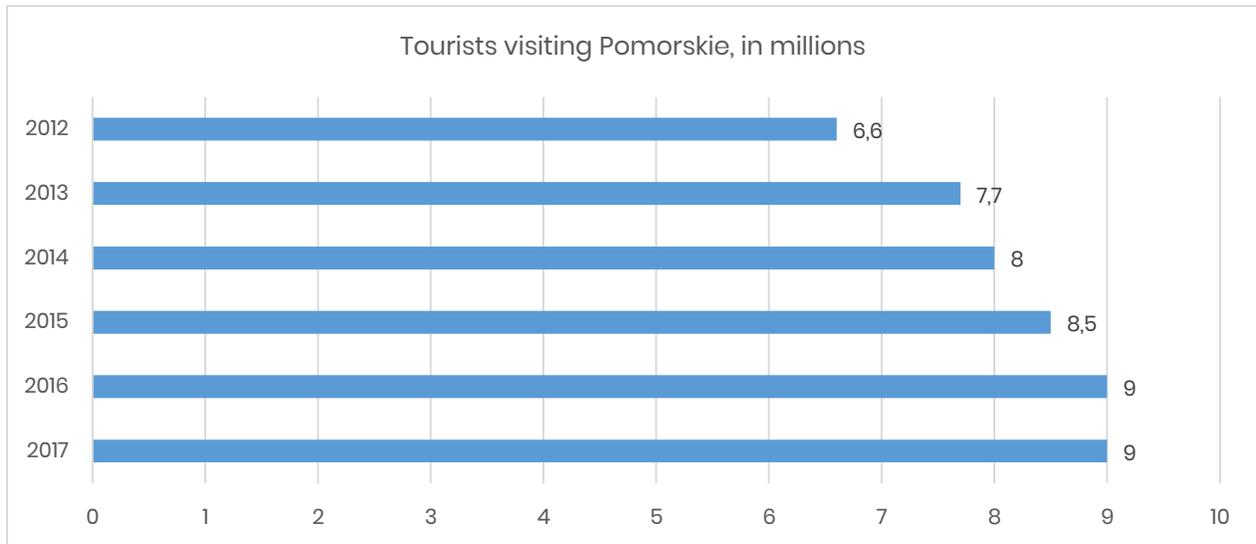
The Tricity metropolitan area has 742 845 inhabitants and the number of inhabitants has increased by 0.3% in the years 2013-2017. (Eurostat, 2017)



**Figure 57: Population change Trojmiejski (PL633) (Eurostat 2018)**

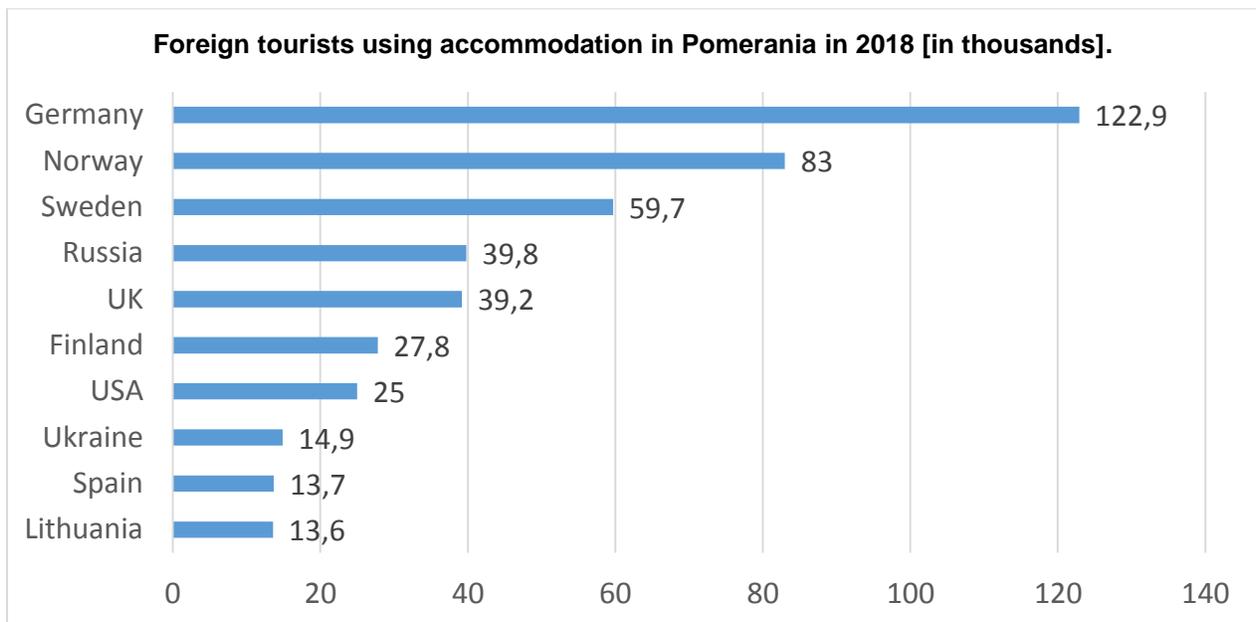
### 3.4.2 Tourism

In 2018, over 9 million tourists visited Pomeranian Voivodship, of which 3 million used accommodation establishments located in the Pomeranian Voivodship - a 6.5% increase compared to 2017. Most tourists – 1 998 million (65.2%) used accommodation in hotel facilities, while the remaining 1.07 million (34.8%) chose other facilities. Accommodation in hotels was selected by 47.9% of domestic tourists and 77.7% of foreign tourists. Foreign tourists constituted 18.8% of the total number of tourists using accommodation in the Pomeranian Voivodship – 2.3% more than in 2017.



**Figure 58: Tourists Visiting Pomorskie, in millions (Urząd Statystyczny w Gdańsku, 2018)**

Tourists from Germany were and are the most numerous group of foreign tourists travelling to Pomeranian Voivodship (21.5%), followed by tourists from Norway and Sweden. (Pomorska Regionalna Organizacja Turystyczna, 2017)



**Figure 59: Foreign tourism in Pomerania in 2018 (Urząd Statystyczny w Gdańsku 2018)**

33.8% of Polish tourists have chosen Pomeranian Voivodship as their summer vacation destination in 2017.

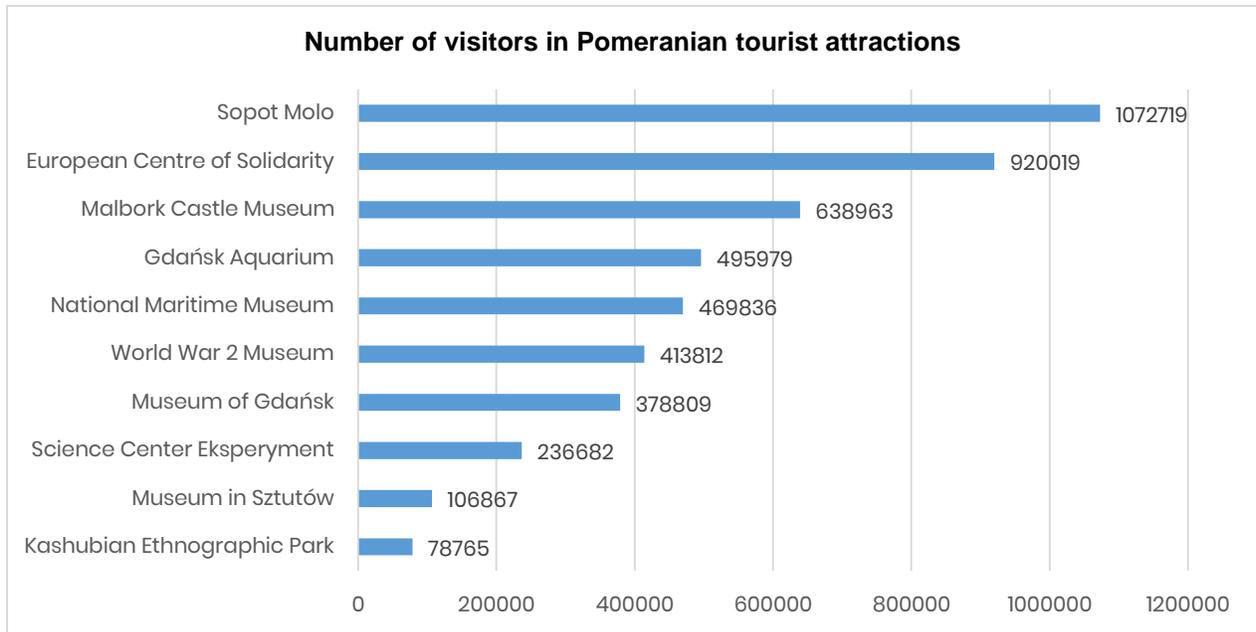


Figure 60: Tourist attractions and number of visitors (Pomorska Regionalna Organizacja Turystyczna, 2017)



Figure 61: Sopot Molo, Karolina Grabowska/Pixabay

### 3.4.3 Employment and commuting

According to Główny Urząd Statystyczny, 248 out of 1 000 inhabitants work in Pomerania. This value is comparable to the rest of Poland. 51.5% of all employed persons are women, and 48.5% are men. The unemployment rate in Pomeranian Voivodship has fallen to 5.5% in 2017 (7.3% in women and 3.9% in men) and dropped by another 16% to 5.1% in 2018 which amounts to 46 300 unemployed persons registered at labour offices, and this value is much lower than average unemployment rate in Poland. In 2017, the average gross monthly wage in Pomeranian Voivodship amounted to PLN 4 497. 154 388 Pomeranian inhabitants commute to work to other municipalities, 146 417 workers come to work from outside the province. 10.6% of professionally active Pomeranian inhabitants work in the agricultural sector (agriculture, forestry, hunting and fishing), 29.4% in industry and construction, and 23.2% in the service sector (trade, vehicle repair, transport, accommodation and catering, information and communication) and 4.5% work in financial sector(financial and insurance activities, real estate services).

The highest degree of concentration of economic activity is within the Tricity metropolitan area (Gdańsk, Gdynia and Sopot, together with neighbouring districts). Apart from Tricity, the region boasts numerous municipalities and towns which are attractive in terms of investment: Słupsk, Tczew, Kwidzyn and Lębork. Companies which are located there include: Scania, E. ON Sverige, Gino Rossi, Curver, Flextronics International, Eaton Trucks, Gemalto, Molex, Tapflo, Alteams and International Paper Kwidzyn. Malbork, Tczew, Starogard Gdański and Wejherowo are examples of towns particularly attractive to investors due to their vicinity to Tricity metropolitan area and accessibility in terms of transport. (EURES, 2018)

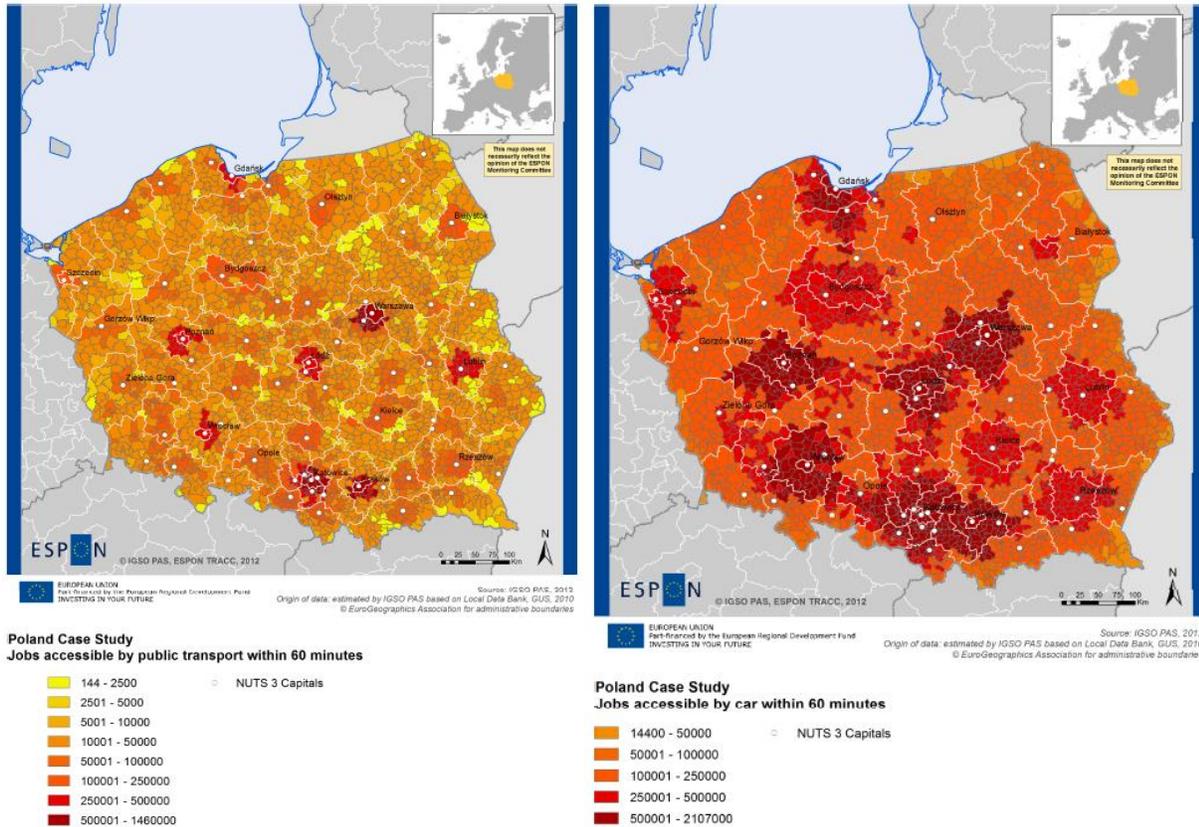
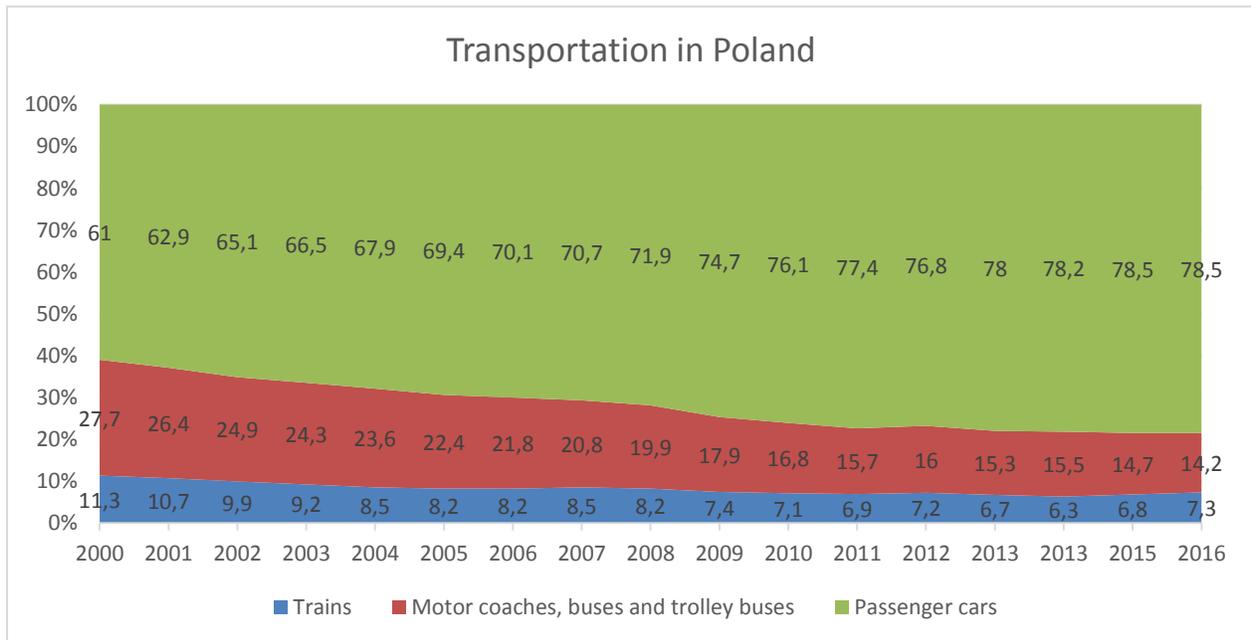


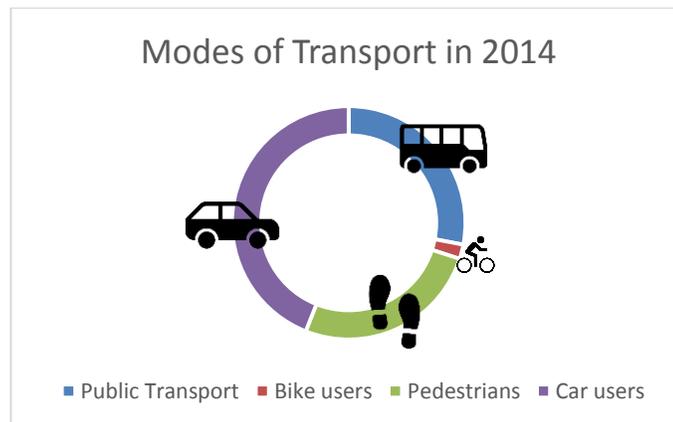
Figure 62: Job accessibility within 60 minutes by PT (left) and car (right) (TRACC 2013).

The statistical data show that in the last 15 years, transportation in Poland increasingly relies on the passenger car transport (Eurostat 2018). While many factors like quality and accessibility of the public transport influence this trend, speed, comfort and convenience of passenger cars make them formidable competitors with alternative modes of transport, particularly when perceived costs are low. (Rodney 2003) Additionally, car ownership is strongly correlated with average net income, which has been rising continuously in Poland in the recent years. (GUS 2018).



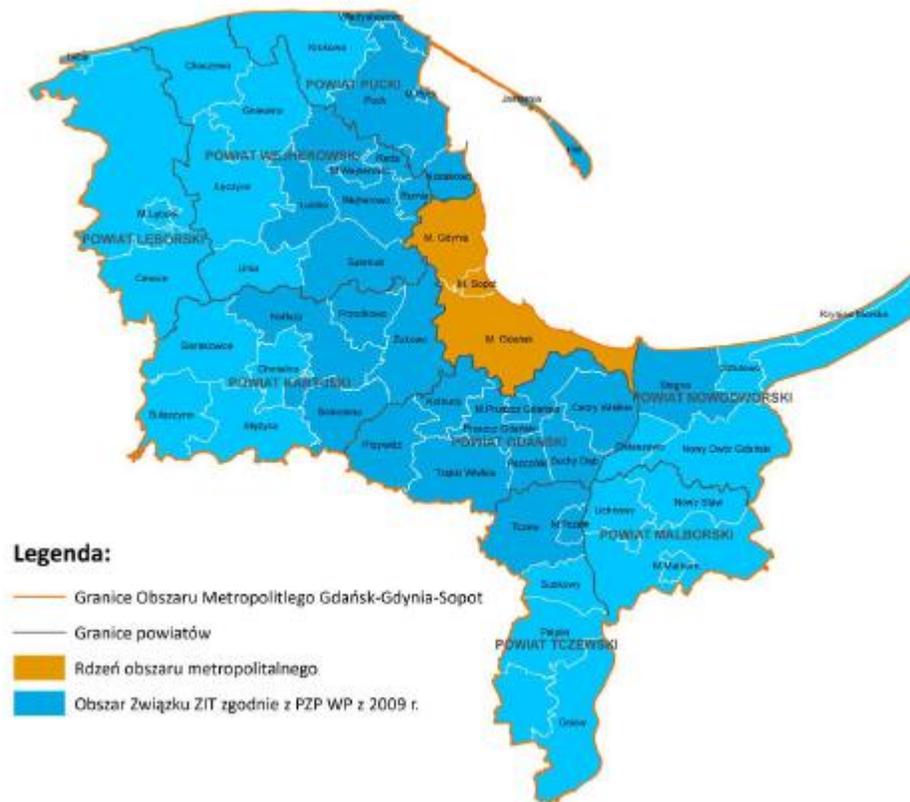
**Figure 63: Transportation in Poland by train, motor coaches and passenger cars (Eurostat 2017)**

The share of public transport and private transport users in the Pomeranian Voivodeship follows the situation in Poland. For the Tricity metropolitan area, the average split between various modes of transport in 2014 was as follows:



**Figure 64: Modal split in the Tricity metropolitan area 2014 (Reported by PP7/Innobaltica)**

Yet the share varies greatly among powiats/counties and the major influencing factor is the length of the travel/commute – the greater the distance to the centre of the metropolitan area, the lower the percentage of public transport usage.



**Figure 65: Spatial Scope of the Metropolitan Area in Pomeranian Voivodeship (STIM 2015)**

The inhabitants of Pomeranian Voivodeship mostly travel between the three major cities – Gdynia, Gdańsk and Sopot creating the core of the Tricity Metropolitan area, followed by the greater Tricity Metropolitan area and by the travelling from and to surrounding powiats/counties.

Other major destinations would be represented by the surrounding voivodships - Warmian-Masurian (via national road S7 and railway), Kuyavian-Pomeranian (via highway A1 and railway) and West Pomeranian (via national road S6 and railway).

### 3.4.4 Public transport

The organization of transport is the responsibility of over 100 entities (123 municipalities, 16 counties and local government), who are contracted to provide public transport services. The multitude of entities resulted in no public transport integration in Pomeranian Voivodship. This lack of integration affects the quality of public transport and makes the transfer of travel information between public transport operators and passengers very difficult.

However, partial integration of public transport exists within the metropolis and is managed by the Metropolitan Association of Communication Gulf of Gdańsk (MZKZG). MZKZG distributes tickets accepted by:

Public Transport Authority of Gdansk (ZTM Gdansk);

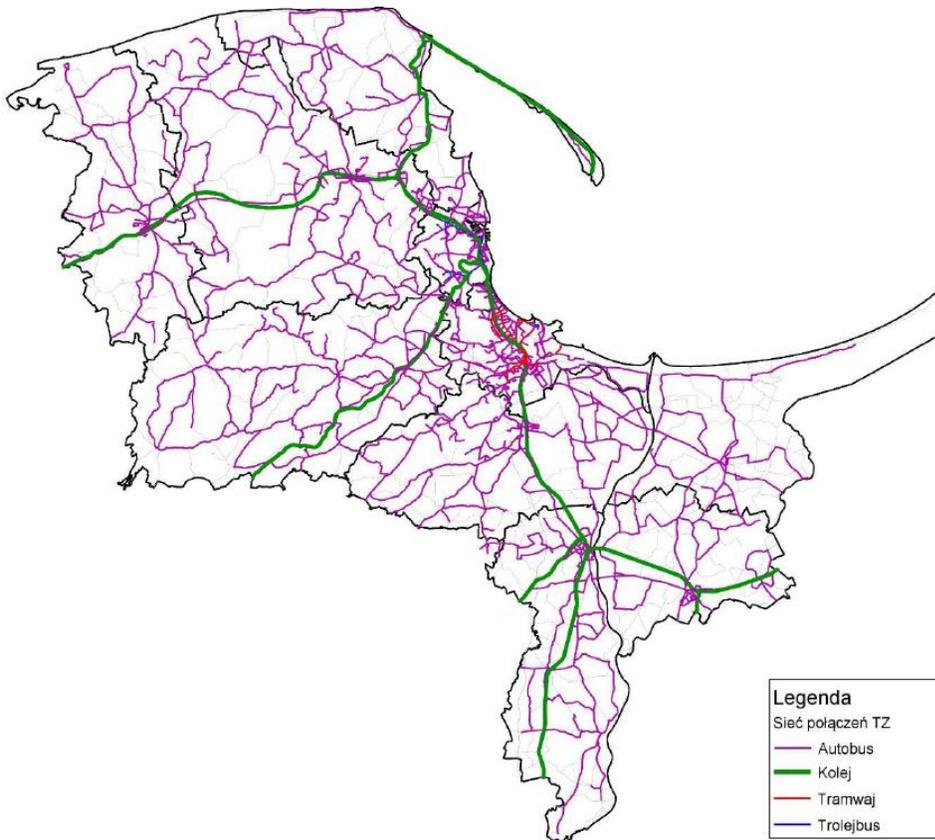
Public Transport Authority of Gdynia (ZKM Gdynia);

Public Transport Operator in Wejherowo (MZK Wejherowo);

Urban Rail (SKM including PKM);

Regional Rail (Przewozy Regionalne).

(Innobaltica, 2018)



**Figure 66: Public Transport Network in Tricity Metropolitan Area (STIM 2015)**

The network of public transport lines in the Tricity Metropolitan area consists of railway and bus lines, and additionally locally in the Tricity area from tram lines (Gdańsk) and trolley buses (Gdynia and Sopot), as well as water trams operating seasonally.



Figure 67: TRISTAR traffic management centre, Gdańsk (Photo: Marian Cihon)

## Passenger rail transport network

Currently, all-year passenger transport is performed on the Tricity Metropolitan area on fourteen railway lines.

Regional railway transport provides direct access to Gdańsk and Gdynia for residents of Malbork, Tczew, Pruszcz Gdanski, Sopot, Gdynia, Wejherowo, and Lębork.

The Pomeranian Metropolitan Railway, which provides transport service for districts and settlements, is of key importance for the development of passenger rail transport within the Tricity Metropolitan area. The Pomeranian Metropolitan Railway, operating on principles similar to the system of the Rapid Urban Railway, with its ability of quickly reaching trains from Gdańsk to Kościerzyna and Kartuzy, can contribute to even greater integration of Tricity Metropolitan areas with each other, and even extending it.

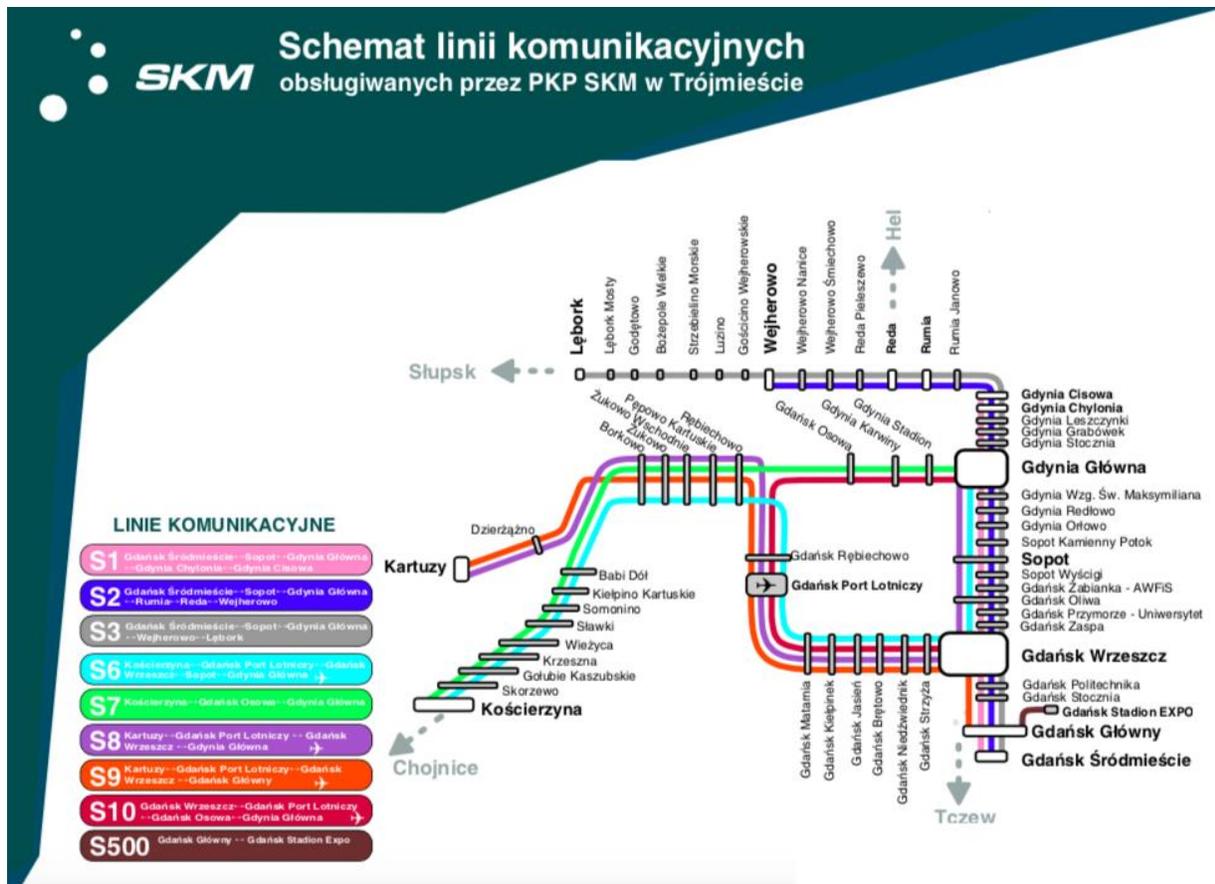


Figure 68: Rapid Urban Rail/SKM lines in Tricity, 2018

## Regional bus transport network

In terms of bus inter-commune offer measured by the average number of courses per one municipality, except the Tricity, the richest public transport offer is provided in the following communes: Tczew, Malbork, Pruszcz Gdański, Kartuzy, Żukowo. The smallest number of inter-municipal courses was recorded in the municipalities of Łęczycze, Krynica Morska, Sztutowo, and Morzeszczyn (less than 25 courses per one commune per day).

Direct bus connections with the Tricity are carried out from most municipalities in the area of Tricity Metropolitan area. The lack of this type of relation was observed in gminas/communes located in the southern part of the Tczew powiat and the northern part of the Tricity Metropolitan area. (STIM 2015)

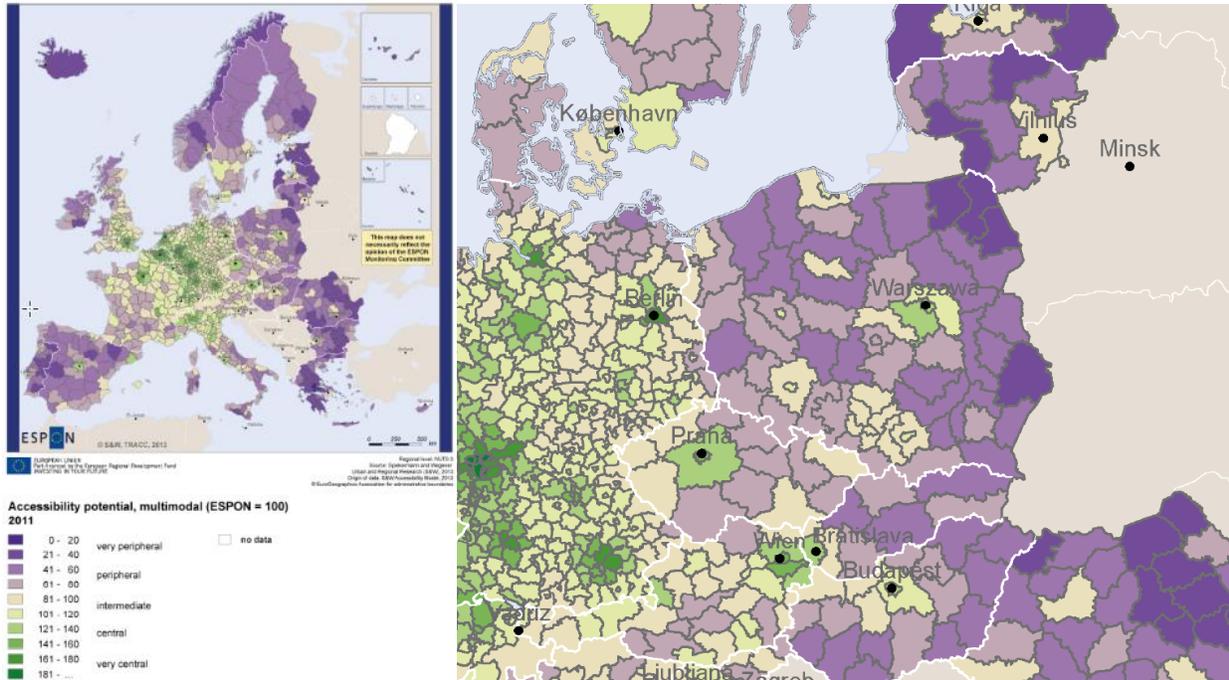
### 3.4.5 Conclusion and recommendations

Being positioned both on a coast and on a crossroad of European transport corridors, Pomeranian Voivodship has very good basic conditions for the development of transport services, including public transport. Steadily increasing numbers of inhabitants and tourists will put more pressure on the existing transport system in the region but regional and cross border travels to Pomeranian Voivodship are negatively affected by multimodal exclusion.

The geographical position of region and metropolitan area creates a situation where low quality of transport infrastructure, especially the infrastructure directly serving the TEN-T corridors, may lead to the whole area being a peripheral region (especially in relation to other major economic development centres in Poland, and Europe) - despite its direct position on TEN-T corridors themselves.

The western and southwestern parts of the region are especially vulnerable to the negative impact of low quality of transport systems. Many years of neglect, underdeveloped road infrastructure, insufficient public transport integration, e.g. technical, organisational, tariff & ticketing, information, and also by poor accessibility and low quality of the public transport especially in the areas outside of the core of Tricity metropolitan area hampers the Pomeranian Voivodship development potential and prevents the shift towards more sustainable, non-car transport.

It is worth noting though, that Pomeranian Voivodship has recently made decisive steps to overcome these challenges and heads towards better public transport in the region – notably in the integration of the public transport systems and common ticketing.



**Figure 69: Accessibility potential to population in 2011. (TRACC, 2013)**

Investment planning in the transport infrastructure, connected with national and European transport systems will increase the throughput and the increasing passengers flow can be serviced.

Creating frequent and direct connections with metropolises in Poland and to neighbouring countries from which Pomeranian Voivodship receives the highest numbers of visitors (Germany, Scandinavia and Baltic states), integration of transport systems with operators from these countries, including common ticketing and synchronized public transport systems should be among the priorities.

### 3.5 Klaipeda (Lithuania)



**Figure 70: Klaipeda (Lithuania) (Google Maps, 2019)**

Klaipeda is a city in Lithuania on the Baltic Sea coast. Lithuania is a country in the Baltic region of Europe. It is situated along the south-eastern shore of the Baltic Sea, to the east of Sweden and Denmark. It is bordered by Latvia to the north, Belarus to the east and south, Poland to the south, and Kaliningrad Oblast (a Russian exclave) to the southwest.

Klaipeda is the third largest city in Lithuania (after Vilnius and Kaunas) with approximately 150 000 residents distributed over an area of 98km<sup>2</sup>. It is located in the western part of the country, stretching almost 20 km along the shores of the Curonian Lagoon and the Baltic Sea. Klaipeda's history dates back to the 13th century (1252) and beyond. With its urban landscape

Klaipeda is still dominated by the old town and its former fortification system remains which is laid out on the mouth of Dane river (Klaipeda Integrated Action Plan 2018-2020).

The population has shrunk from the city to the suburbs and the hinterland. The city had a population of 207,100 in 1992 that decreased to 157 350 in 2014 but the city is growing again. Popular seaside resorts found close to Klaipeda are Nida to the south on the Curonian Spit and Palanga to the north.

Klaipeda County (Lithuanian: Klaipėdos apskritis) is one of ten counties in Lithuania. It lies in the west of the country and is the only county to have a coastline. Its capital is Klaipeda. On 1<sup>st</sup> of July 2010, the county administration was abolished and since that date, Klaipeda County remains as the territorial and statistical unit.

The county consists of seven municipalities:

- Klaipėda City Municipality
- Klaipėda District Municipality
- Kretinga District Municipality
- Neringa Municipality
- Palanga City Municipality
- Skuodas District Municipality
- Šilutė District Municipality

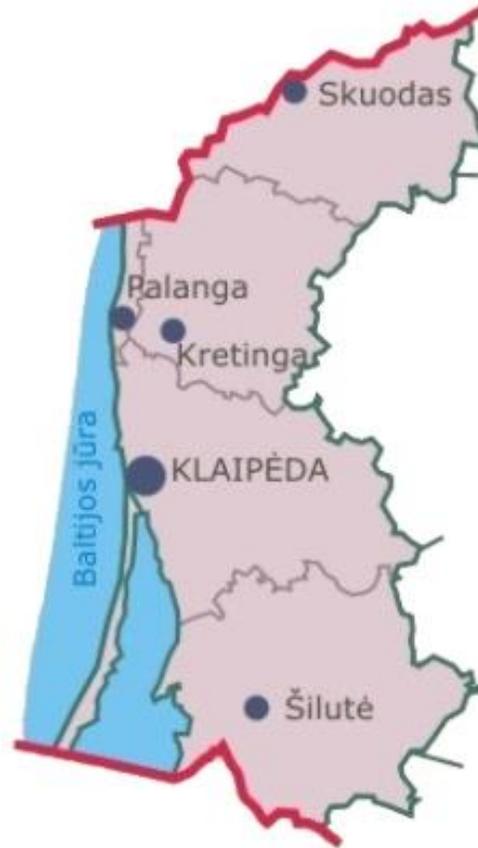


Figure 71: Map of Klaipeda County (Lithuanian Ministry of International Affairs, 2019)

### 3.5.1 Population

Similar to the rest of Lithuania, Klaipeda city shows obvious signs of shrinking with a rapidly declining population (from approx. 204 200 in 1990 to 151 300 in 2017, in total –26%), whereas the Klaipeda county (Klaipedos apskritis) shrunk from 331 553 inhabitants to 320 507 between 2013 and 2017. This negative trend is accompanied by economic and demographic restructuring. The latter is extremely evident in diminishing proportion of younger population resulting in deepening talent problems in the city.

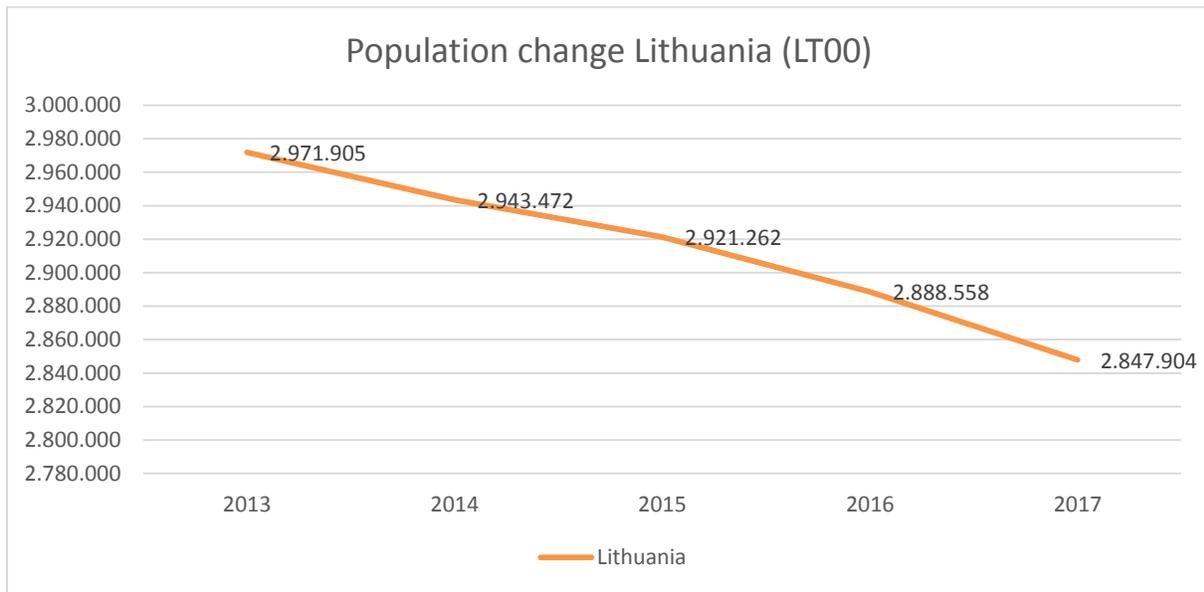
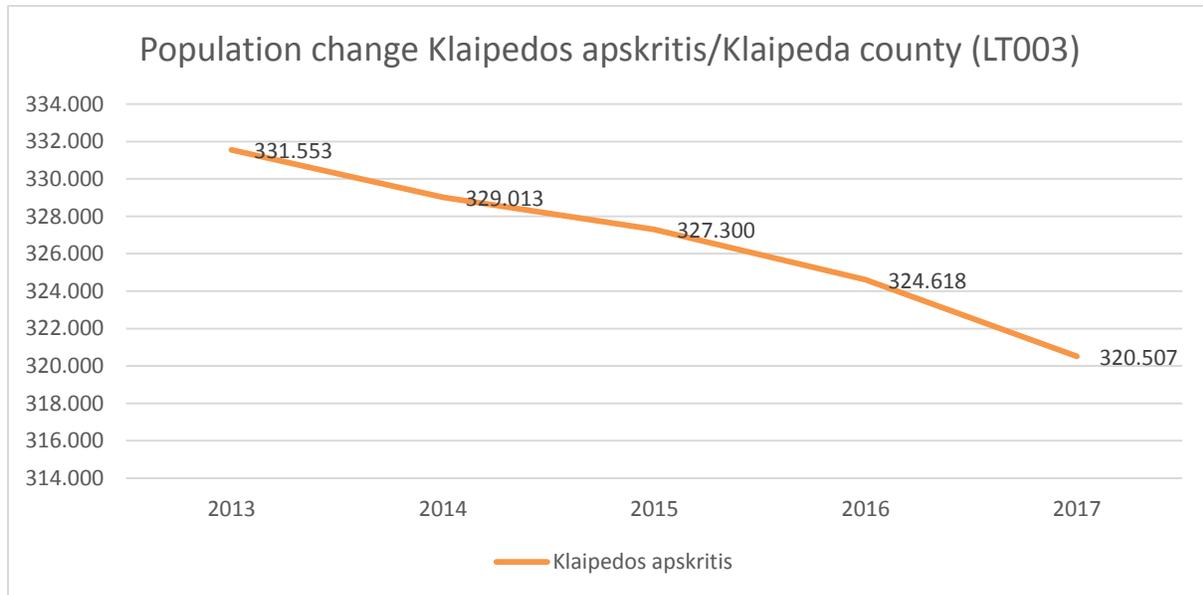


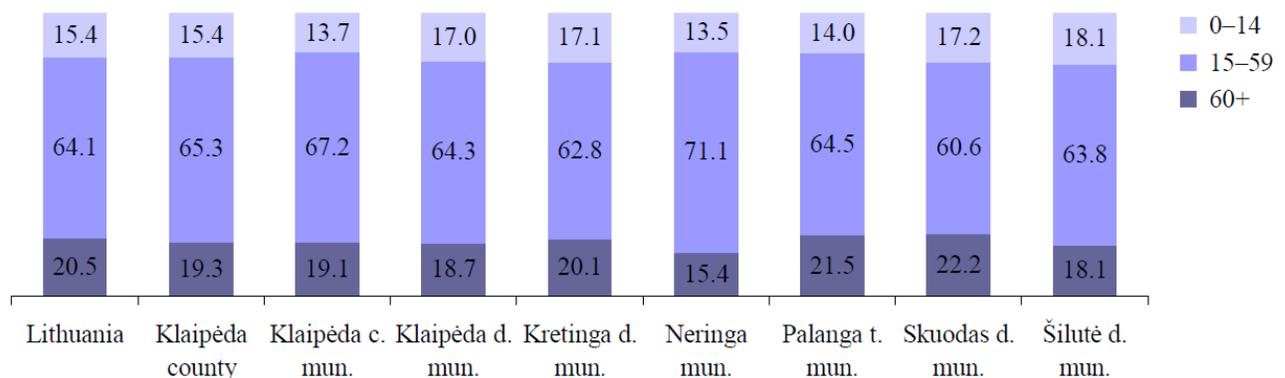
Figure 72: Population change in Lithuania (2013-2017) (Eurostat, 2019)



**Figure 73: Population change in Klaipėda county (2013-2017) (Eurostat, 2019)**

Despite that, Klaipėda County remains to be one of the demographically “youngest” ones in all of Lithuania. Elderly people (aged 60 and older) in the county make up 19.3% (a little below the national average - 20.5%). Currently, each seventh man (national average - each sixth) and each fourth woman in Klaipėda County are aged 60 and older.

At the beginning of 2008, the number of children aged under 15 was at 20.3 % (with national average being - 25.2%) lower than that of elderly people. In 2001-2007, the number of children in the county decreased by 25% (national average - 24.7%) (Lithuanian Department of Statistics 2008).



**Figure 74: Population structure by main age groups 2008 (Lithuanian Department of Statistics 2008)**

### 3.5.2 Tourism

The accommodation establishments of Lithuania received 3.62 million tourists in 2018, which is 11.3% more than in 2017.

In 2018, accommodation establishments received 1.744 million foreign tourists. Compared to 2017, their number grew by 10.2%.

The largest number of foreign tourists staying in the accommodation establishments of Lithuania came from Russia (5.1%), Poland (5.0%), Belarus (4.6%), Latvia (4.5%), Ukraine (2.6%) and Estonia (1.8%).

The number of tourists from the European Union staying in the accommodation establishments of Lithuania grew by 11.7% and reached 1.05 million (46.2% of all the foreigners accommodated). Compared to 2017, the number of tourists from non-EU countries increased from 650 thousand to 702 thousand in 2018 (Tourism in Lithuania 2018).



Figure 75: International tourists' arrivals (2018) (Lithuania Travel, Statistics Lithuania)

Most of the foreigners using the services of travel agencies or tour operators arrived from Germany, United Kingdom, Italy, France, Sweden and Norway. Lithuanians travelled the most to Turkey, Greece, Egypt, Spain, Bulgaria, Italy, and Poland (Tourism in Lithuania 2018).

According to the data of the Bank of Lithuania, in 2015, income from travel services totalled EUR 1.03 billion, or 17.2% of the total exports of services. Travel costs amounted to EUR 804.64 million, or 19.1% of the total imports of services. Compared to 2014, exports of travel services decreased by 0.7, imports – increased by 1% (Transport in Lithuania 2015: 78).

The largest number of foreign tourists stayed in Vilnius (57.5%), Kaunas (11%) and Druskininkai (8.6%) accommodation establishments. The remaining municipalities represented 10.9% of foreign tourists staying in accommodation establishments.

94% tourists arrive in Lithuania by car or by plane. Therefore, the main challenge for further increasing inbound tourism flows is to improve the country's accessibility by air. (Lithuanian Tourism strategy 2016-2020: 19). Palanga, one of the three major Lithuanian international airports is located about 35 kilometres north of Klaipeda and is connected with it by the A13 (E272) highway. Palanga airport received 317 thousand passengers in 2018, a 7% increase over 2017, and 4623 flights in the same period (Lithuanian Airports 2018).

Located at the Baltic Sea, Klaipeda enjoys coastal and marine tourism. Ferries from the city centre connect Klaipeda with the Smiltynė, a popular tourist destination, the Curonian Spit peninsula. Cruises and regular ferries by DFDS Seaways and TT-Line are operated from Central Klaipeda Terminal (Klaipeda State Seaport) to Trelleborg, Sweden and Kiel, Germany. The Sea Farer’s Centre calls in around 7000 vessels annually.

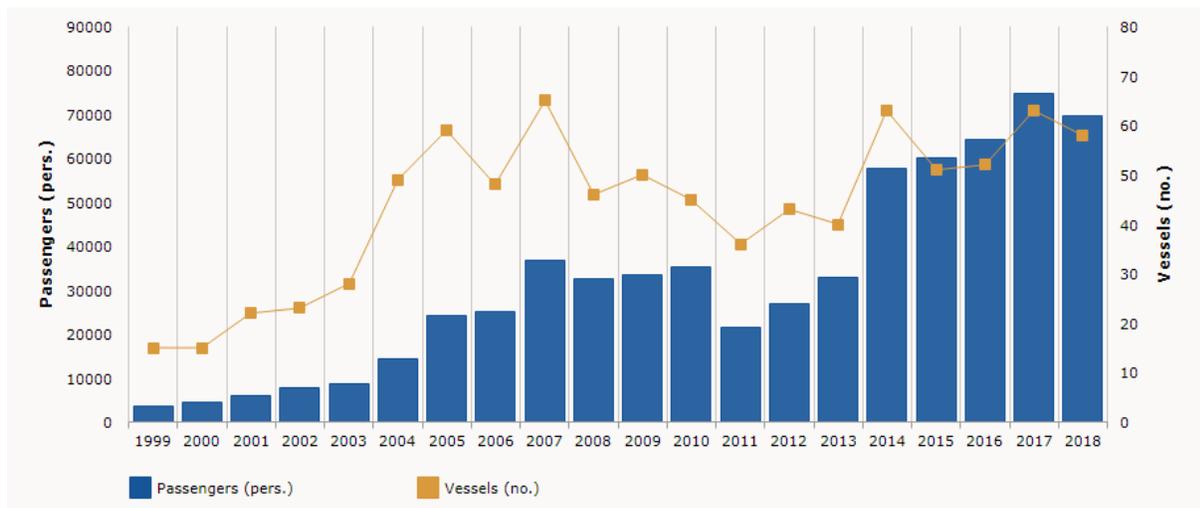


Figure 76: Cruise shipping in Klaipeda (Port of Klaipeda, 2018)

### 3.5.3 Employment and commuting

Of the entire working-age population the unemployed made up a portion of 6.4%, the same as in 2016. A total of 205 persons had found work since the start of the year, 40 individuals were referred to active labour market policy schemes and 162 new job vacancies were registered during the month of January 2019 (EURES 2019).

Although the unemployment level has diminished since 2010 (from 16.8% to 6.4% in 2017), Klaipeda's labour market is still dominated by large businesses, e.g. wholesale trade, logistics and manufacturing.

The largest number of vacancies has been registered in the wholesale and retail, manufacturing, construction companies. The majority of economic activities does not offer a necessary supply of skilled labour working spaces. The lowest vacancies are recorded in agriculture, professional, scientific, technical and educational work.

Lack of employment opportunities in the latter sectors forces the youth to leave Klaipeda and choose other Lithuanian or foreign cities. While students still choose to work in the service sector during their studies, they tend to leave after graduating because of limited career opportunities, relatively smaller salaries and lack of knowledge based, well paid employment opportunities, which do not reflect their growing needs. A young person at the beginning of a career usually earns a minimum wage or an amount close to it. The minimum wage in Lithuania is the third lowest in the whole European Union (Klaipeda Integrated Action Plan 2018-2020).

#### Commuting

Regarding transportation including the commute to e.g. work or education facilities, the car still represents the most commonly used mode of transport in Klaipeda (Figure 77).

On average, the communication infrastructure in Klaipeda County is developed better than in the rest of Lithuania with a denser road network. However, it is mostly conditioned by high density of road networks in Klaipeda city and Palanga town municipalities. Other county's municipality's communication infrastructure is of poorer development quality.

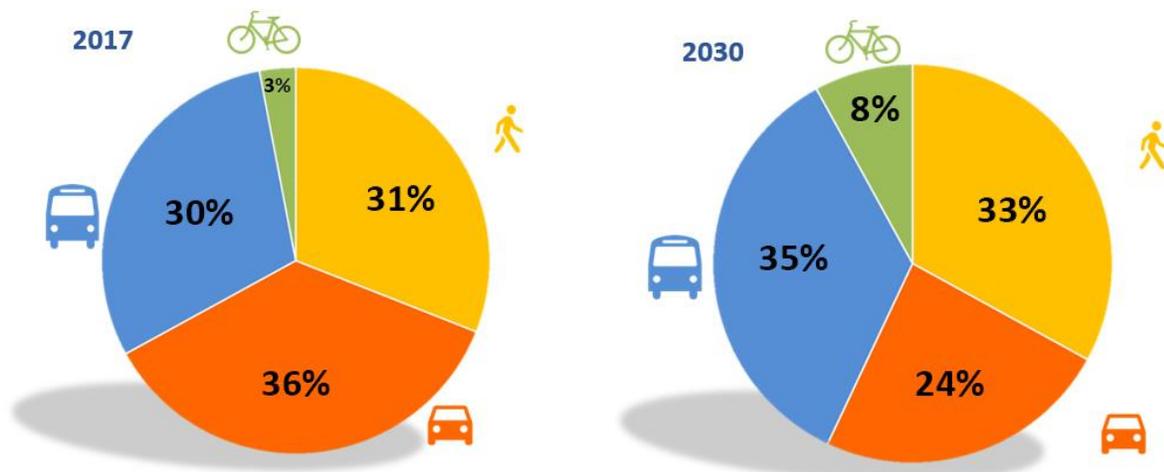
Transport (both public and private) systems in Klaipeda County allow accessing the necessary parts of the social infrastructure and obtaining services as fast and comfortable as possible. In

most of the county's municipalities, the communication system functions better than in the rest of Lithuania; however, some important objects of the system are hard to access due to relatively sparse distribution thereof, sparser network of settlements and the infrastructure connecting them.

Three major groups of public transport in Klaipeda have been recognized as the following:

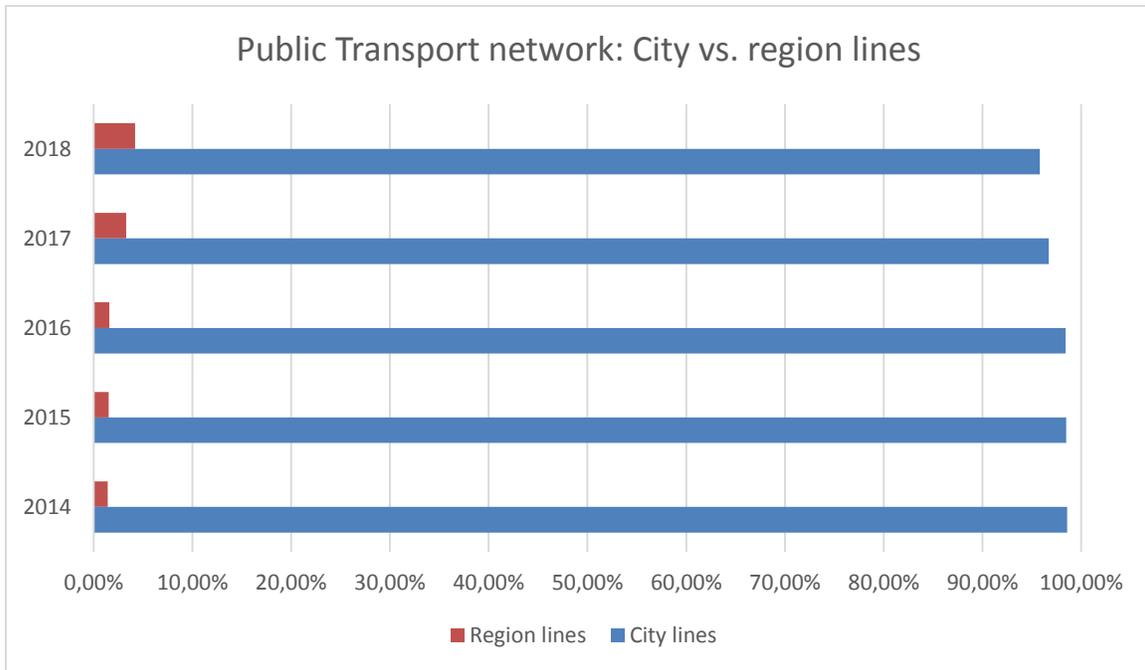
- daily commuters
- students and pupils
- elderly people.

The inhabitants of Klaipeda city travel mainly by individual car transport (36% of all trips), 31% are pedestrians; public transport is used by 30% of the inhabitants. Bicycle riders represent the smallest group of 3%. The city of Klaipeda aims to reduce the number of car trips to 24% and increase the number of trips by public transport to 35 and 8% respectively.



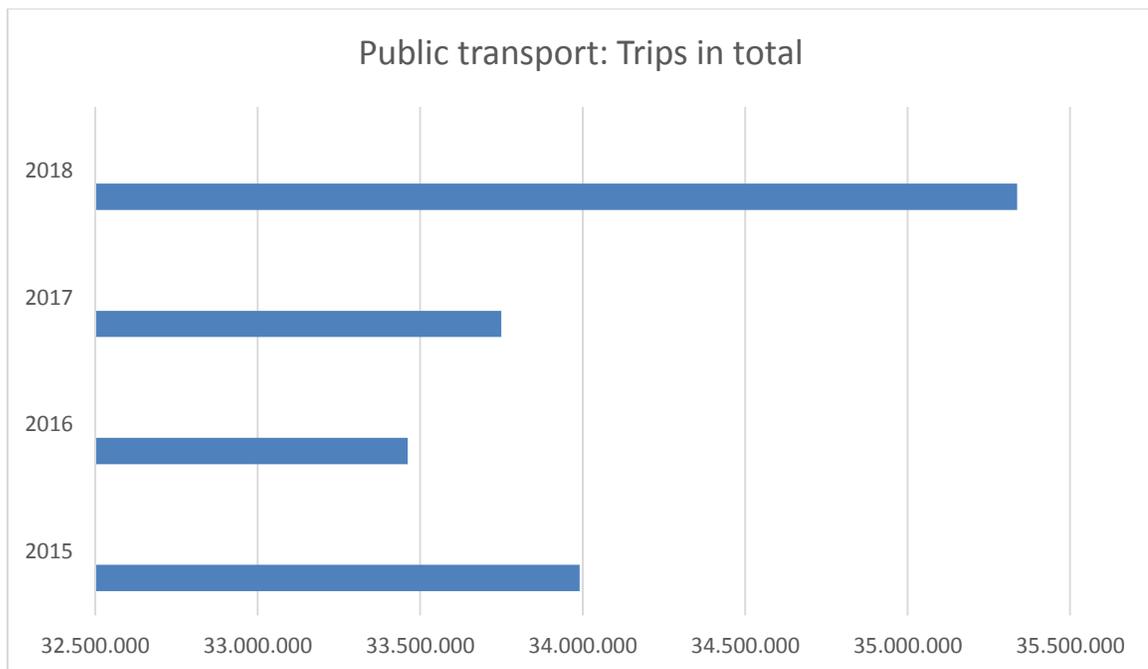
**Figure 77: Modal split of the transport in Klaipeda (Klaipeda Public Transport Authority)**

According to the 2017 survey amongst the Klaipeda citizens, 40% of the respondents drive by car more than five times a week, 25% of surveyed do not drive at all. Public transport is used by 39% of respondents more than once a week, 10% use public transport only a few times a month. 41% of respondents ride a bicycle at least once a week and 48% do not use the bicycle at all. 61% of respondents walk five or more times during the week. 60% of the surveyed population from the suburban areas do not use buses at all. (Klaipeda SUMP, 2017)



**Figure 78: Public Transport Network: City vs. region lines (Klaipeda Public Transport Authority)**

Number of trips by public transport has been steadily increasing in Klaipeda and amassed to a total of over 35.3 million trips in 2018.



**Figure 79: Public Transport Network: Trips in total (Klaipeda Public Transport Authority)**

Higher parking fees, implementation of a new e-ticketing system, a more attractive and younger bus fleet of which average age has dropped from 14 years in 2015 to 9 years in 2018, but also a decrease in city population and increase of suburban population were recognized as important factors of the total increase in the trips made by public transport.

### 3.5.4 Public transport

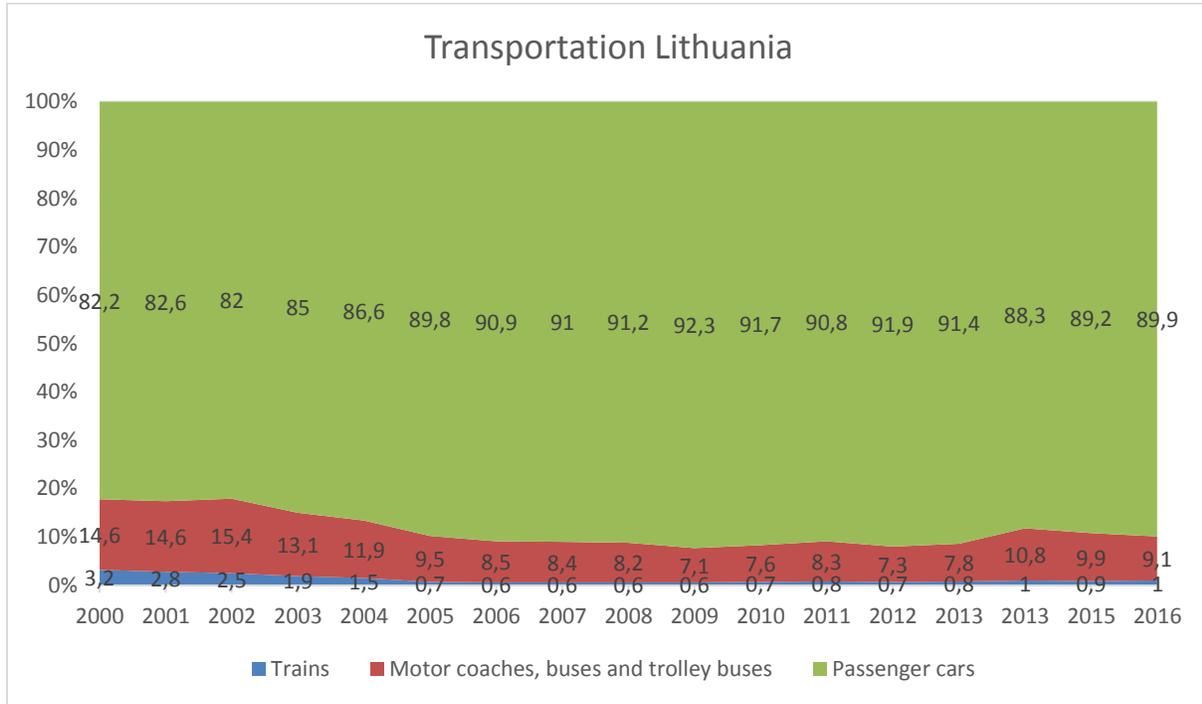


Figure 80: Transportation in Lithuania - modal split (Eurostat, 2019)

As shown in Figure 80, the transportation in Lithuania is dominated by the individual car transport followed by transport by bus. Rail passenger transport in Lithuania has drastically declined in recent years. Limited accessibility of railway together with a low population density and low perceived attractiveness are among the major factors contributing to this trend (2008 Country Report Lithuania: 82).

The city of Klaipeda is connected by transport links to the main and cluster roads, which join from the west side of town. The most important of these roads is the A1 motorway Klaipeda-Vilnius, which is also the international transport corridor IX B (Klaipeda SUMP, p115)

A train line connects Klaipėda with Vilnius (Klaipėda-Kretinga-Plungė-Telšiai-Šiauliai-Radviliškis-Kėdainiai-Jonava-Kaišiadorys-Vilnius) and Šilutė (Klaipėda-Dituva-Priekulė-Šilutė). Trains are operated by the national railway operator Lietuvos geležinkeliai/Lithuanian Railways. (Figure 81, full size image - [https://www.traukiniobilietas.lt/portal/attachments/27281/LG\\_MAP\\_4.svg](https://www.traukiniobilietas.lt/portal/attachments/27281/LG_MAP_4.svg))

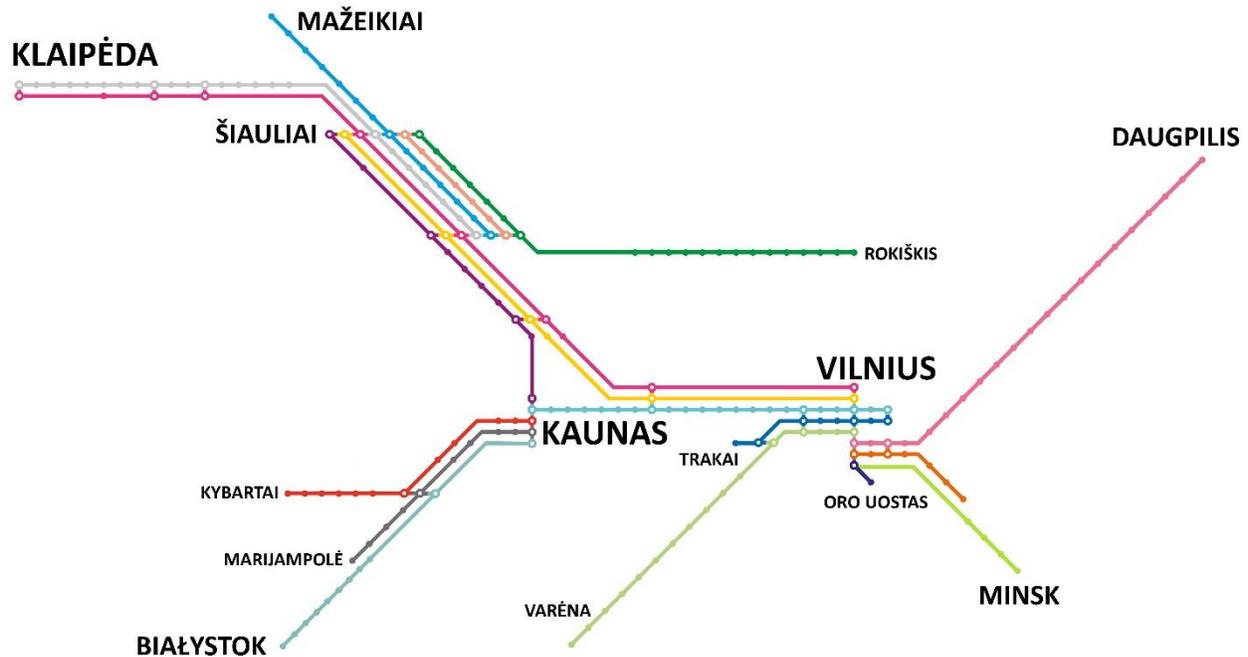


Figure 81: Train lines in Lithuania (Lithuanian Railways 2019)

The public transport in Klaipėda is organized by its public transport authority - Klaipėdos Keleivinis Transportas. The public transport in the city and around its vicinity is served by nine public transport operators. In 2018, the majority of the trips (95.79%) were made within the city, the rest of the trips (4.21%) were from and to the surrounding region.



**Figure 82: Line 23 bus in Klaipeda City (Photo: Marian Cihon)**

The bus-operated public transport is divided into two major groups – short range feeder lines and middle range suburban bus lines (58 in total) in the following three tariff zones:

**Short range:**

Feeder lines (No 7, 15B, 21A, 23, 24)

- *Valid city (ZONE 1) tariffs*
- *Operated with mini buses*

**Middle range:**

Suburban bus lines (11A, 11B, 21, 25, 26, 27, 28, 29, 30, 40, 41, 42, 100)

- *Ticket price depends on distance*
- *Check-in/Check-out and Zone 2/3 term tickets available*
- *Operated with mini busses/busses*

Suburban route taxi lines (31, 32)

- *Flat rate ticket prices*
- *No discounts*
- *Operated with mini buses*

(Klaipeda Public Transport Authority, 2018)

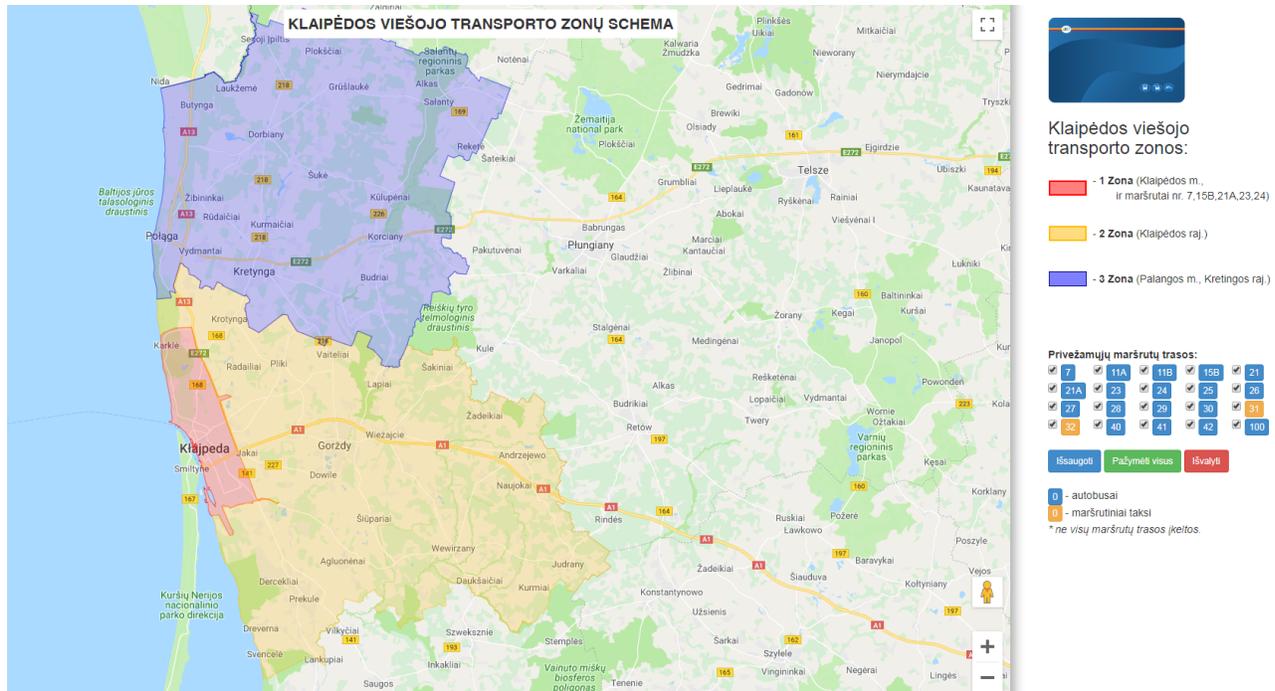


Figure 83: Klaipėda tariff zones (Klaipėda Public Transport Authority, Google Maps 2019)

### 3.5.5 Conclusion and recommendations

The city of Klaipėda views its future as an environmentally friendly and comfortable city for its citizens. Public transport development with multimodal transport hubs, promotion of non-motorised, non-car reliant transport with new cycling infrastructure network and more sustainable car traffic are amongst its priorities for the upcoming years. A higher level of public transport service will ensure a greater choice of this mode of transport for travel and will attract car drivers to switch to public transport.

The current sustainable urban mobility plan foresees greater interoperability of suburban public transport routes with better integration of urban public transport systems with neighbouring municipalities. Implementation of common ticketing and e-ticketing system in the years 2017 and 2018 ensured favourable conditions for passengers regardless of their social and geographical location.

Yet, some transport links are uncomfortably served by public transport, making the public transport less attractive. Speed, comfort, convenience and safety are mostly emphasized as crucial for choosing car over public transport by the Klaipėda county citizens. Very low parking fees and non-strict parking fines system in the city centre further encourages for car usage.

### 3.6 Vimsii (Estonia)

This paragraph on Viimsi Municipality (Viimsi Vald) describes how the suburban/rural community needs are served by PT lines (activity 3.4). Unlike the previous regions of analysis, market segments and needs for regional and cross-border public transport services including “reasons to go” and framework conditions (activity 3.3) are not covered in this section. In this thematic study, insights from a representative of Viimsi Municipality are used. Viimsi Parish is one stakeholder of public transport organisation of the area. The information is mainly based on the INTERCONNECT study visit (activity 4.6) and seminar (activity 4.2) in Viimsi in 2018 where data on local/regional public transport was shared.



Figure 84: Google Maps (2019): Viimsi Vald [<http://maps.google.com/maps>; 2019-04-12]

Viimsi Parish is located in northern Estonia in the Harju province of which Tallinn is the capital city (Figure 81). The Harju County consists of twelve different parishes and four urban areas. The administrative centre of Viimsi Parish is Haabneeme borough, a relatively small city 11 kilometres northeast of Tallinn city centre within the coastal area of the Baltic Sea. The parish consists of the Viimsi Peninsula and 15 islands. The surface area of Viimsi Parish amounts to almost 73 km<sup>2</sup>. In total, 20 132 residents are living in 18 different settlements. The bordering municipalities are Jõelähtme Municipality, Maardu City and Tallinn City (Pirita and Lasnamäe) (Figure 85) (Saar 2018 / Jagiełło et. al. 2018: 32).



Figure 85: Harju County: Municipalities (Saar 2018)

### 3.6.1 Public Transport in Viimsi Parish

Viimsi Municipality is responsible for ordering PT services via the Põhja-Eesti Public Transport Centre, a non-profit organisation founded by 25 local governments of the Harju County. The Põhja-Eesti Public Transport Centre acts as a state's representative of the Harju County Government. The aim of the Põhja-Eesti Public Transport Centre is the organisation of public transport in Harju County in order to raise the quality of public transport services and ensure more favourable transport services for its inhabitants. The organisation thus aims at providing an optimal network of routes, coordinated schedules and a unified fare system. A characteristic is that from the 1st of July 2018, 11 of Estonia's 15 counties introduced free-of-charge public transport on county buses, making Estonia the first country in the world to introduce free public transport on an almost nation-wide scale (Saar 2018). In Harju County county lines are free for students to 21 years and for elders from 63 years.

The capital settlement Haabneeme borough contains more than two thirds of the main destinations of the Parish within a radius of around 3 km that may require public transport the most. These include facilities of education and leisure including schools and kindergartens, health and welfare and other essential facilities such as main supermarkets (Saar 2018). The public transport network of the Parish is thus developed around Viimsi with most lines serving a part of the capital settlement connecting it with the outskirts of the parish.

From 1<sup>st</sup> July 2019, the public transport system relevant for Viimsi Parish consists of the following lines (Figure 86):

- 11 bus lines in parish (V1 –V9)
- 3 Harju county line (114, 115, 174)
- 3 Tallinn cross-border line (1A, 38, 49)
- 2 School bus lines
- 1 Ferry line to Prangli island



**Figure 86: Viimsi Parish Public Transport Network (Saar 2018)**

In 2018, the municipality bus lines (V1 –V9) have driven 549 000 vehicle-km, while having 231 200 boardings. The Harju County line (114), in comparison, served 209 000 boardings. However, finding reliable data on transportation remains a challenge since many public transport users do not validate their tickets. Students, for example, represent one of the main user groups. They do not have to validate their journey although for them public transport is free of charge. There are also people forgetting or even refusing to validate. Because of the importance for PT planning, however, informational campaigns have been introduced to promote ticket validations (Saar 2018).

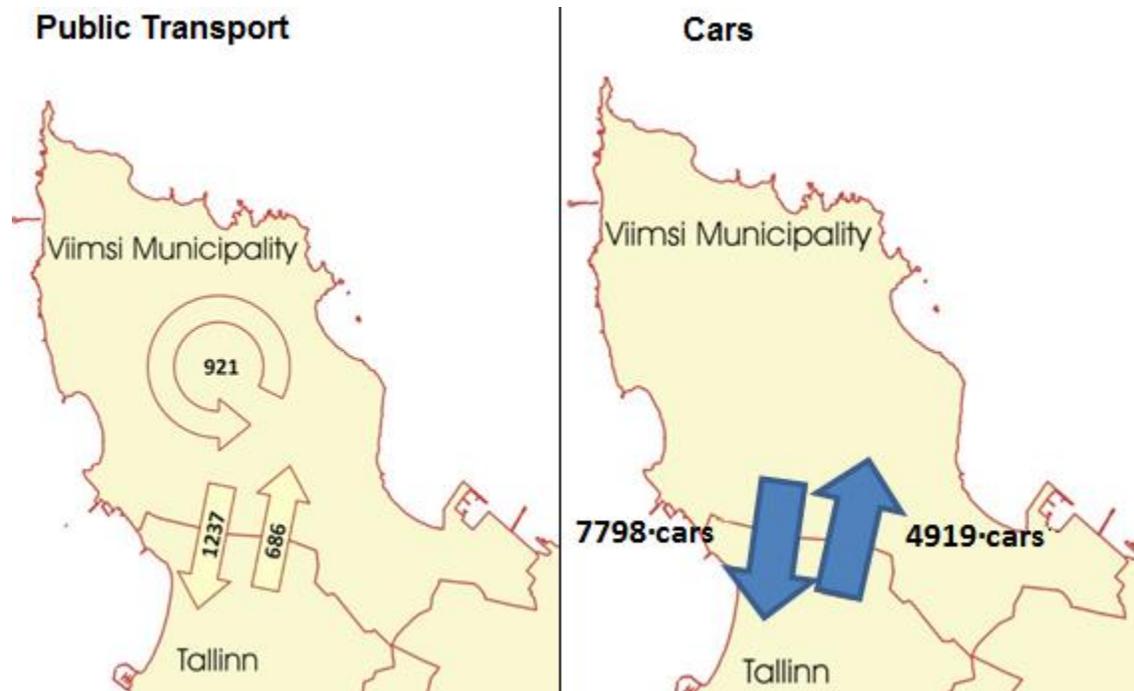
Besides a well-developed public transport system, commuting by car is still presenting a major challenge though. A prime example with the highest traffic flows of daily commuters in Viimsi is the Viimsi – Tallinn axis with streets such as Randvere street (Viimsi Parish) as well as its

continuation Merivälja and Pirita street (Figure 87) (Tallinn area). The high amounts of cars lead to environmental and safety issues that the municipality must deal with. Although there are more than 200 departures per day in both directions, congestion occurs regularly on a daily basis (Saar 2018).



**Figure 87: Congested Pirita Street (Saar 2018)**

In fact, on an average workday between 6 a.m. and 2 p.m., it is assumed that almost 2 000 commuters use public transport on the Viimsi-Tallinn axis, whereas almost 13 000 frequent the same route by car (Figure 88). The high amount of public transport bus departures hence leads to the question why a majority of the commuters still prefer private cars. One reason may be the possibility of free parking. According to data Saar (2018) referred to, almost 90 % of the car drivers did not pay for their parking spot. Another reason may be the availability of cars, whereas only 7 % of the households do not possess a car, 93 % have at least one car (37 %) or 2 or more cars (56 %). A poll suggests that private cars are mostly used because of higher degrees of comfort, privacy and independence, habits and inconvenient schedules of public transport. Moreover, 74 % of Viimsi Parish inhabitants state to visit Tallinn 4 to 7 times a week. Timely travel patterns of Harju County reveal a peak of commuters between 7:00 and 8:00 in the morning and between 17:00 and 18:00 in the late afternoon (Kantar Emor 2018).



**Figure 88: Public transport vs personal car use (average workday between 6 a.m. and 2 p.m.) (Saar 2018)**

Public transport seems to be within a walking distance for most people: 86 % of the people in Harju County live within 1 km radius of a bus station. Train traffic does not have the same level of accessibility distance-wise: Only 19 % of the inhabitants live within 1 km of a train station, whereas a majority (54 %) lives 3 km or more away (Kantar Emor 2018).

Under certain circumstances, private car users may switch to using public transport. According to a statistic (Kantar Emor 2018), the most common mentioned conditions where:

- Creation of more suitable public transport lines,
- Faster public transport and
- Improved park and ride possibilities at transport hubs.

According to Saar (2018), authorities are working on improving public transport. For example, in the future, the following is foreseen to be implemented: two new county lines (115, 174) (from 1<sup>st</sup> July 2019), a new P&R system in Lubja, a new ferry line to the island of Naissaar and an electric bus line between certain schools. Existing municipality lines will furthermore be redesigned (Figure 89) and “smart” solutions will probably be considered.

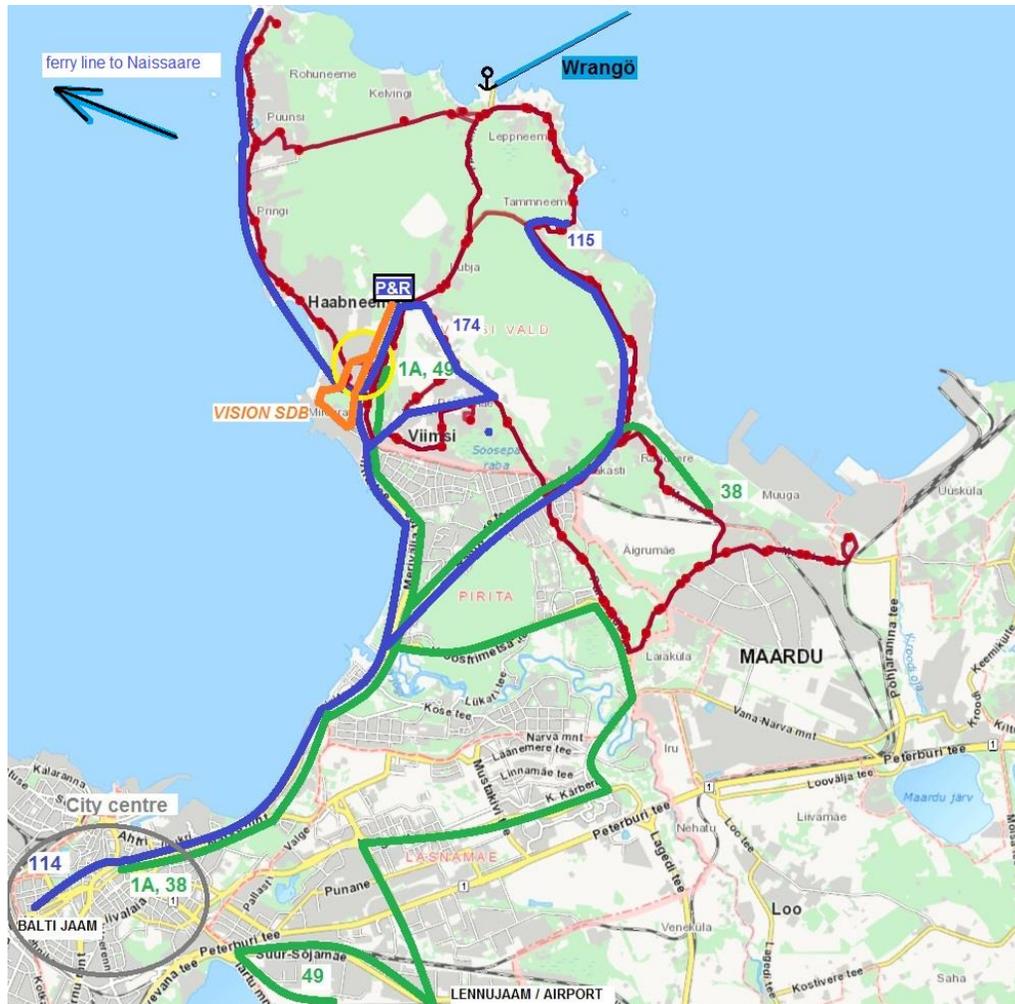


Figure 89: Future public transport of Viimsi (Saar 2018)

### 3.6.2 Conclusion and recommendations

Given the strong traffic flows to and from Tallinn with a high degree of private car use, Viimsi is pressured to make changes in order to enhance the importance of public transport. Since ongoing building developments create additional living space for thousands of people, the number of inhabitants of Viimse Parish is expected to rise up to 30 000 in the near future adding additional pressure on infrastructure and the transport system in both areas of Viimsi and Tallinn. This may, on the one hand, require even more drastic changes than those currently planned. Infrastructural investments may therefore be necessary for further expanding the Tallinn tram lines or city trains to better and faster connect its suburban areas.

On the other hand, promotion campaigns as well as pricing schemes related to car ownership should be further considered to alter the travelling and commuting behaviour of the suburban

population. The available public transport system with more than 100 daily departures per direction on the axis from Viimsi to Tallinn does indeed suggest a high degree of available capacity, which, however, is not yet fully embraced by the commuting population.

## 4 Conclusions and recommendations

This section concludes with comparing the main topics by highlighting its commonalities and differences that can be found within the analysed regions. These topics include main market segments, population development including aging demographics, tourism, commuting, framework conditions among employers and authorities as well as local/regional and cross-border connectivity.

Therefore, all five areas of Rostock (Germany), Guldborgsund Municipality (Denmark), Blekinge (Sweden), Pomorskie (Poland) and Klaipeda (Lithuania) have been analysed in reference to three main market segments of public transport usage, namely the elderly (and growing/shrinking) population, tourists and commuters.

On the one hand, the aging population is a pervasive phenomenon among the considered areas of the South Baltic Region. Since the average age of population has mostly been increasing over the recent decade elderly people make up a substantial part of the overall population, leading to certain requirements public transport needs to fulfil more and more. As the example of Blekinge shows, elderly people or people with disabilities often use public transport, e.g. to visit the municipalities' city centres for shopping and dining, for other entertainment purposes or to receive medical treatment in one of the hospitals, which are mainly located in and around the city centres of the area.

The development of population numbers, on the other hand, is rather diverse. Whereas the areas of the city of Rostock and its district, the Tricity in Pomorskie, Blekinge and Viimsi have been experiencing or are expecting growing or at least rather stable numbers, other regions such as Guldborgsund and Klaipeda have had shrinking population numbers. Reasons for the shrinkage have been named as being a result of high birth deficits and net migration losses. One of the strongest decreases have been observed in Klaipeda city with a shrinkage of 26 % (from approx. 204 200 in 1990 to 151 300 in 2017). This negative trend has been accompanied by economic and demographic problems with strongly diminishing proportions of younger population groups and, in particular, the highly educated.

Tourism represents a main “reason to go” to visit a certain area. Typical for the coastal Baltic areas are, for instance, long sand beaches, islands and certain areas close to the beauty of nature with large amounts of holiday accommodation. Various attractions, such as historic city

centres, museums, theatres, zoos, hotels with spa arrangements, events, golf courses and other amenities can be very beneficial for prolonging the holiday season by attracting visitors throughout the year. All considered areas can be seen in having the touristic attractiveness in common. Depending on the frequency of tourists at certain touristic “magnets”, public transport should thus also be targeted actively at fulfilling the needs of tourists.

Particularly daily commuting is shaped by a major car-reliance in the respective regions, in particular for those who commute from/to rather rural suburban areas to/from the city centres. Whereas living conditions in suburban areas can be seen as favourable by a large stake of the population, employment rates are usually lower there and higher in urban areas / cities. This often requires commuting over larger distances with travel patterns peaking in the mornings with commutes to the working places and in the late afternoons with commutes back to the residential areas.

Since public transport networks especially in suburban areas tend to lack spatial density and timely frequency compared to the urban areas of cities, commuting is characterised by a predominant car-reliance. In fact, rural public transport is often rather concentrated on basic needs. In the examples of Guldborgsund Municipality and Rostock District the suburban public transport by buses thus mainly serves the target groups of commuting pupils or students followed by the group of people that cannot drive or do not have a car as well as by tourists.

As it was pointed out within the analysis of Blekinge, however, commuters often prefer public transport because of several advantages: It can be seen as comfortable and, compared to traveling by car, cost effective. Environmentally cautious commuters also accentuate the public transport’s sustainability as opposed to travelling by car. And perceived hurdles, such as expensive parking fees and limited parking space, may further cause commuters to use public transport instead of cars.

Nevertheless, people commuting by car tend to refrain from or minimise their use of public transport because of longer travel times as opposed to cars, reduced comfort and lacks of information related to public transport connections. For instance, besides a well-developed public transport system in Viimsi with more than 100 bus departures per day in per direction between Viimsi and Tallinn, congestion occurs regularly on a daily basis creating environmental and safety issues that the municipality has to deal with. Whereas almost 2 000 commuters use public transport on the Viimsi-Tallinn axis, almost 13 000 frequent the same route by car. This

may be supported by conditions such as free parking possibilities in the city, the high availability of cars in almost every household (93 %), inconvenient schedules of public transport and higher perceived comfort of cars including flexibility, privacy and independence.

Under certain circumstances, private car users may switch to using public transport. Mentioned conditions where e.g. the creation of more demand oriented and faster public transport lines as well as improved park and ride possibilities at transport hubs.

The challenges arising from commuting by car may not only require drastic changes regarding infrastructural investments with the expansion of PT networks, but also promotion campaigns as well as pricing schemes related to car ownership should be further considered to alter the travelling and commuting behaviour of suburban populations. In some places, well-developed public transport systems do indeed exist with the potential to reduce the car reliance, which, however, is not yet fully embraced by the commuting population.

Representatives of the considered regions have also been asked about existing and desired framework conditions supporting the use of public transport. Among employers, PT supporting schemes are generally lacking, such as in Guldborgsund Municipality where employers don't have possibilities to e.g. stimulate an enhanced use of public transport since "The offer of PT is very different from area to area – in some areas there is no PT at all". Travellers therefore have "no other opportunity than go[ing] by car". In Blekinge, for instance, it was mentioned that some employers have environmental policies giving advantages to their employees when using public transport. This, however, mostly only applies to travels during their working hours. There are no subsidies for coming to work using public transport. Although public transport organisers have promoted the idea of yearly tickets for employees, this has been used rarely until now. In fact, company owners or employers should support sustainable public transport by an environment-friendly agenda to make PT available or more affordable for their employees with a framework of conditions that support travelling with lower environmental impacts. Policies that support commuting and other work-related trips by public transport, bike or foot should be strongly considered and realised. The case of Copenhagen, for instance, could be consulted: Public spaces usually devoted to car traffic demands have been transferred to other ways of travel, thus also enhancing the visibility and usage of public transport within the city.

Framework conditions provided by public transport operators are considered to be worked on constantly in most cases. In Guldborgsund, the PT operating stakeholders work on improving

their services by, for example, upgrading the DSB train connection between Nykøbing Falster and Copenhagen for higher travel speeds and more comfort. In Blekinge it was highlighted that all public transport in Sweden is operated by contract and subsidised by the municipalities at, in average, about 50%. Since authorities have interest in decreasing pollution and making people less dependent on cars, this can be a favourable framework condition supporting the use of public transport. To less favour car traffic, the representative of Blekinge, furthermore suggest decrease subsidies for car travelling and to put more emphasis on climate change and sustainable means of transport to combat health problems as well as to save the environment.

Compared to well-developed public transport networks of e.g. bus, tram and city train lines within the city borders, the public transport outside larger cities in the suburban areas generally offer rather sparse networks of regional bus and a few train lines with mostly infrequent connections. This spatial divergence is particularly evident in Rostock and its surrounding, where the comparably dense PT system of the local PT provider RSAG ends at the city borders. Hence, to curb the car-reliant commuting and besides providing more appropriate cycling infrastructure, a reliable PT system with high departure frequencies should not end at the city borders, but instead, spread beyond at least into those urban settlements where most of the commuting originates from. This may include the extension of bus, tram lines or city trains to the suburbs such as Kritzmow, Roggentin or Rövershagen. Since administrative borders are often too high regarding the responsibility for investments, a supporting measurement can be the incorporation of spatially close local authorities by the city of Rostock into their administrative area.

Similar to the District of Rostock, the bus lines in Guldborgsund do not yet encourage the majority to commute by public transport. Instead, bus lines within Guldborgsund municipality mainly serve the target groups of commuting pupils and students followed by the group of people that cannot drive or do not have a car as well as by tourists. Most frequented bus destinations therefore include the municipality's capital of Nykøbing especially for educational but also consumption (i.e. shopping-) purposes. It is believed that the potential for using public transport is higher than the current level of utilisation. Improvements should therefore increase the frequency of departures since often only a few connections per day are available particularly from the rural areas to the towns.

Blekinge's public transport network's is spread over many islands, which represents a unique characteristic among the analysed project partner's regions. Public transport by boat is thus a

frequently used mode of transport in this area. This network of ferries is especially attractive for leisure and touristic purposes for e.g. traveling from Karlskrona to the surrounding archipelago.

The public transport system of Pomorskie and the Tri-city respectively may, on the one hand, be a well-developed and dense network serving the needs of the metropolitan citizens. On the other hand, it is also marked by rather poor accessibility in the areas outside of the core metropolitan area and insufficient integration (of PT systems, at regional, metropolitan and local scale regarding the areas of technology, organisation, ticketing and information). Further pressure and necessity for changes may have been added by increasing travel needs of its own population as well as by the steadily increasing number of tourists. Without further investments in public transport, the development of the Pomeranian Voivodship as well as the shift towards more sustainable, non-car transport may be hampered.

Also the transportation in Lithuania is dominated by individual car transport followed by transport by bus. Rail passenger transport in Lithuania, for instance, has drastically declined in recent years. Limited accessibility of railway together with a low population density and low perceived attractiveness are among the major factors contributing to this trend. The inhabitants of Klaipeda city thus travel mainly by individual car transport (36% of all trips). After pedestrians (31%), the modal split ranks public transport on third position (30 %) in the city. Klaipeda therefore aims at promoting public transport in order to make travelling more environmentally friendly and comfortable. In fact, public transport development with multimodal transport hubs, promotion of non-motorised, non-car reliant transport with a new cycling infrastructure network are amongst Klaipeda's priorities for the upcoming years. The current sustainable urban mobility plan, for instance, promotes better interoperability/integration of urban and suburban public transport routes as well as with neighbouring municipalities by e.g. implementing a common e-ticketing system.

Curbing the car-reliant mobility is not particularly easy on the cross-border level, since the economic needs of the ferry operators as well as external circumstances must be considered. For example, unfavourable weather conditions can significantly delay ferry arrivals to a time point that subsequent public transport in the port city is not adjusted to. A common ticket between different public transport operators, such as the Intercombi ticket for travels between Rostock (Germany) and Nykøbing F. (Denmark), may lead to additional legal responsibilities (e.g. being counted as the "travel-organising" party for the whole journey although only one part

has been served). More passengers attracted by a common ticket can also mean a higher probability to reach the passenger capacity limits. It was furthermore stated regarding Guldborgsund Municipality that although public transport may have the potential to be used more often, the main user groups largely refuse to do so, since better possibilities, i.e. a train connection from the municipality's capital to the port of Gedser, are lacking and the frequency of buses may not be sufficient for many people.

In the Pomeranian Voivodship, further investments in the transport infrastructure, particularly where it is connected with national and European transport networks, are expected to increase passenger flows also regarding cross-border travels. Among the priorities should be the creation of frequent and direct connections with metropolises in Poland and to neighbouring countries from where the highest numbers of visitors come from (i.e. Germany, Scandinavia and the Baltic states). The public transport systems should furthermore be integrated including the implementation of common ticketing and the synchronisation of schedules.

## 5 References

- Aguiar, B. & Macário, R. (2017):** The need for an Elderly centred mobility policy, in: Transportation Research Procedia 25 (2017) 4355–4369.
- Albalade, D. & Bel, G. (2010):** Tourism and urban public transport: Holding demand pressure under supply constraints, in: Tourism Management 31 (2010) 425–433.
- ARK56 (2019):** ARK56 - Connected coastal trails in a UNESCO biosphere reserve [<https://ark56.se/en/home-2/>, 2019-06-21].
- Bajada, T. & Mifsud, D. & Di Ciommo, F. (2016):** Accessibility as an indicator of transport equity. The case of public transport infrastructure in Malta, and its impact on the elderly, in: Xjenza Online - Journal of The Malta Chamber of Scientists [<https://core.ac.uk/download/pdf/46604115.pdf>; 2019-03-15].
- Bamford, C. et al. (1987):** The use of association analysis in market segmentation for public transport: a case study of bus passengers in West Yorkshire, UK. In: Transportation 14 (1987): 21-32.
- Bleis, J. (2017):** Rostock auf Kurs [[https://www.vmv-mbh.de/fileadmin/downloads/Rostock%20auf%20Kurs\\_Entw3\\_2017%200629\\_aktuell.pdf](https://www.vmv-mbh.de/fileadmin/downloads/Rostock%20auf%20Kurs_Entw3_2017%200629_aktuell.pdf); 2019-04-12].
- Blekinge Business (2018):** Municipalities - Business Blekinge [<http://businessblekinge.se/municipalities/>; 2019-06-20].
- Blekingetrafiken (2018a):** Map of public traffic in Blekinge. [[https://blekingetrafiken.se/globalassets/filarkiv/03zonkarta/zonkarta\\_blekinge-2018.pdf](https://blekingetrafiken.se/globalassets/filarkiv/03zonkarta/zonkarta_blekinge-2018.pdf), 2019-06-20].
- Blekingetrafiken (2018b):** Map of public transport in Karlskrona, Blekinge. [<https://blekingetrafiken.se/globalassets/filarkiv/04linjekartor/karlskrona/karlskrona-tunnelbanekarta.pdf>, 2019-06-21].
- Blickle, Paul et. al. (2019):** Europas Speckgürtel-effekt, Zeit.de, 18.07.2019. [[https://www.zeit.de/politik/ausland/2019-07/demografie-europa-bevoelkerung-entwicklung-wandel-karte?utm\\_source=pocket-newtab](https://www.zeit.de/politik/ausland/2019-07/demografie-europa-bevoelkerung-entwicklung-wandel-karte?utm_source=pocket-newtab), 2019-07-24] based on the data of the Bundesinstitut für Bau-, Stadt- und Raumforschung, (03/2019) [[https://www.bbsr.bund.de/BBSR/DE/Veroeffentlichungen/BBSRInfo/2019/bbsr-info-3-2019-dl.pdf?\\_\\_blob=publicationFile&v=2](https://www.bbsr.bund.de/BBSR/DE/Veroeffentlichungen/BBSRInfo/2019/bbsr-info-3-2019-dl.pdf?__blob=publicationFile&v=2), 2019-06-12].
- Brandenhoff Hansen, M (2019):** Guldborgsund giver nabokommunerne baghjæl på antal overnatninger [<https://via.ritzau.dk/pressemeddelelse/guldborgsund-giver-nabokommunerne-baghjul-pa-antal-overnatninger?publisherId=11287667&releaselId=13576841>; 2019-04-30].
- Brinkhoff, T. (2019 a):** Guldborgsund (Municipality, Sjælland, Denmark) - Population Statistics, Charts, Map and Location [<https://www.citypopulation.de/php/denmark-sjælland.php?adm2id=376>; 2019-06-20].
- Brinkhoff, T. (2019 b):** Guldborgsund (Municipality, Sjælland, Denmark) - Population Statistics, Charts, Map and Location [[http://citypopulation.info/en/denmark/admin/sj%C3%A6lland/376\\_guldborgsund/](http://citypopulation.info/en/denmark/admin/sj%C3%A6lland/376_guldborgsund/); 2019-06-20].

- Cameron, J. & Kingma, R. (2002):** Public Transport in Cape Town: Market Segmentation and Policy Tests to Give Effect to Modal Shifts. In: 21st Annual South African Transport Conference South Africa, 15 - 19 July 2002 'Towards Building Capacity and Accelerating Delivery'.
- Cantwell, M. & Caulfield, B. & O'Mahony, M. (2009):** Examining the Factors that Impact Public Transport Commuting Satisfaction, in: Journal of Public Transportation, Vol. 12, No. 2, 2009.
- Center for Vækstanalyse (2018):** Vækstvilkår 2017; Lokal erhvervsstruktur og vilkår for vækst i GULDBORGSUND [[http://vaekstanalyse.dk/file/650183/vvk\\_guldborgsund.pdf](http://vaekstanalyse.dk/file/650183/vvk_guldborgsund.pdf); 2019-04-30].
- Cohen, S. et al (2014):** Understanding and Governing Sustainable Tourism Mobility: Psychological and Behavioural Approaches. Routledge, New York  
[[https://books.google.de/books?id=JzgsAAQBAJ&dq=tourists+public+transport&hl=de&source=gbs\\_navlinks\\_s](https://books.google.de/books?id=JzgsAAQBAJ&dq=tourists+public+transport&hl=de&source=gbs_navlinks_s); 2019-04-30].
- COWI (2015):** Befolkningsprognosen Guldborgsund Kommune 2015-2028  
[[https://www.guldborgsund.dk/~media/POLITIK/Politikker\\_og\\_strategier/Kommuneplanstrategi/Befolkningsprognose\\_Guldborgsund\\_Rapport\\_2015.ashx](https://www.guldborgsund.dk/~media/POLITIK/Politikker_og_strategier/Kommuneplanstrategi/Befolkningsprognose_Guldborgsund_Rapport_2015.ashx); 2019-04-30].
- Deschermeier, P. (2017):** Bevölkerungsentwicklung in den deutschen Bundesländern bis 2035  
[[https://www.iwkoeln.de/fileadmin/publikationen/2017/357919/IW-Trends\\_2017-03-04\\_Deschermeier.pdf](https://www.iwkoeln.de/fileadmin/publikationen/2017/357919/IW-Trends_2017-03-04_Deschermeier.pdf); 2019-04-30].
- Donini, L. et al. (2012):** Malnutrition in elderly: Social and economic determinants, in: The journal of nutrition, health & aging. January 2013, Volume 17, Issue 1, pp 9–15  
[<https://link.springer.com/article/10.1007/s12603-012-0374-8>; 2019-03-15].
- Ecorys Neatherlands BV (2006):** Study on Strategic Evaluation on Transport Investment Priorities under Structural and Cohesion funds for the Programming Period 2007-2013 – Country report on Lithuania  
[[https://ec.europa.eu/regional\\_policy/sources/docgener/evaluation/pdf/evalstrat\\_tran/lithuania.pdf](https://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/evalstrat_tran/lithuania.pdf); 2019-05-17]
- EURES (2018):** Database – EURES:  
[<https://ec.europa.eu/eures/main.jsp?lang=en&acro=Imi&catId=2799&countryId=PL>; 2019-06-28].
- EURES (2019):** Lithuanian Labour Market  
[<https://ec.europa.eu/eures/main.jsp?catId=2780&countryId=LT&acro=Imi&lang=en&regionId=LT0&nuts2Code=LT00&nuts3Code=LT003&regionName=Klaipedos%20apskritis>; 2019-04-10]
- EURES (2019):** The European Job Mobility Portal. Labour Market Information. Blekinge,  
[<https://ec.europa.eu/eures/main.jsp?catId=2604&acro=Imi&lang=en&countryId=SE&regionId=SE0&nuts2Code=SE04&nuts3Code=SE041&regionName=Blekinge%20%C3%A4n>, 2019-06-23].
- European Commission (2019):** Regional Development Strategy for Region Blekinge 2014-2020, 15.07.2019 [<https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/policy-document/regional-development-strategy-region-blekinge-2014-2020>, 2019-06-29].
- Eurostat (2018):** Database – Eurostat [<https://ec.europa.eu/eurostat/data/database>; 2018-12-10].

- EuroStat (2018):** JRC and European Commission Directorate-General for Regional Policy, 2019-06-03].
- Eurostat (2019):** Database – Eurostat [<https://ec.europa.eu/eurostat/data/database>; 2019-07-25].
- Fatima, K et al. (2018):** A Case Study of Elderly Public Transport Accessibility, in: Proceedings of the 7th International Conference on Transportation and Traffic Engineering (ICTTE 2018), Beijing, China, 21-23 December 2018, pp. 1-6 [<https://researchbank.rmit.edu.au/view/rmit:51717>; 2019-03-12].
- Fundacja Rozwoju Inżynierii Lądowej (2015):** Strategia Transportu i Mobilności Obszaru Metropolitalnego do 2030 r., Annex nr 2, Diagnoza systemu transportowego Obszaru Metropolitalnego, p.9. [[https://www.metropoliagdansk.pl/upload/files/STIM\\_2%20-%20Pe%C5%82na%20Diagnoza.pdf](https://www.metropoliagdansk.pl/upload/files/STIM_2%20-%20Pe%C5%82na%20Diagnoza.pdf); 2019-04-30]
- Fundacja Rozwoju Inżynierii Lądowej (2015):** Strategia Transportu i Mobilności Obszaru Metropolitalnego do 2030 r., Annex nr 4, Transportowy model prognostyczny podróży dla Obszaru Metropolitalnego, p.38. [[https://www.metropoliagdansk.pl/upload/files/STIM\\_4%20-%20Model.pdf](https://www.metropoliagdansk.pl/upload/files/STIM_4%20-%20Model.pdf); 2019-04-30].
- Garcia, A. et al. (2013):** Integrating public transportation in personalised electronic tourist guides, in: Computers & Operations Research 40 (2013) 758-774.
- Główny Urząd Statystyczny, 2018:** Komunikat Prezesa Głównego Urzędu Statystycznego w sprawie realnego wzrostu przeciętnego wynagrodzenia, 2012-2018 [<https://stat.gov.pl/sygnalne/komunikaty-i-obwieszczenia/lista-komunikatow-i-obwieszczen/komunikat-w-sprawie-realnego-wzrostu-przecietnego-wynagrodzenia-w-2018-roku-w-stosunku-do-2017-roku,274,6.html>; 2019-06-3].
- Google Maps (2019):** Blekinge province [<http://maps.google.com/maps>; 2019-06-21].
- Gordon, P. & Kumar, A. & Richardson, H. (1986):** The Influence of Metropolitan Spatial Structure on Commuting Time, in: Journal of Urban Economics 26,138-151 (1989).
- Griesbach, J. (2015):** Rebus mit neuen Bussen unterwegs. In: Schweriner Volkszeitung 2015-10-07 [<https://www.svz.de/10890801>; 2019-04-30].
- Gronau, W. (2017):** Encouraging behavioural change towards sustainable tourism: a German approach to free public transport for tourists. In: Journal of Sustainable Tourism, Volume 25, 2017 - Issue 2, p. 265-275 [<https://doi.org/10.1080/09669582.2016.1198357>; 2019-06-28].
- Guldborgsund Kommune (2018 a):** BEVÆG DIG FOR LIVET – Guldborgsund Kommune Visionsaftale 2018-2023 [<http://www.gsir.dk/-GSIR/4-Guld/Nyt/vis-aftale.pdf>; 2019-04-30].
- Guldborgsund Kommune (2018 b):** Grundfortaelling A3 Juni17 [[https://www.guldborgsund.dk/~media/OM\\_KOMMUNEN/Organisation/Grundfortaelling\\_A3\\_Juni17.ashx](https://www.guldborgsund.dk/~media/OM_KOMMUNEN/Organisation/Grundfortaelling_A3_Juni17.ashx); 2019-04-20].
- Guldborgsund Kommune (2019 a):** Tal og fakta [[https://www.guldborgsund.dk/da/Om\\_kommunen/Tal\\_og\\_fakta.aspx](https://www.guldborgsund.dk/da/Om_kommunen/Tal_og_fakta.aspx); 2019-04-30].
- Hall, C. & Le Klähn, D. & Ram, Y. (2017):** Tourism, Public Transport and Sustainable Mobility. Channel View Publications [<https://books.google.de/books?id=GJfzDQAAQBAJ>; 2019-06-28].

- Hanse- und Universitätsstadt Rostock (2018 a):** Statistisches Jahrbuch 2018  
[[https://rathaus.rostock.de/sixcms/media.php/rostock\\_01.a.4984.de/datei/HRO\\_Jahrbuch%202018.pdf](https://rathaus.rostock.de/sixcms/media.php/rostock_01.a.4984.de/datei/HRO_Jahrbuch%202018.pdf); 2019-04-12].
- Hanse- und Universitätsstadt Rostock (2018 b):** Rostock in Zahlen 2018  
[[https://rathaus.rostock.de/sixcms/media.php/rostock\\_01.a.396.de/datei/Rostock%20in%20Zahlen%202018\\_endg%C3%BCltig.pdf](https://rathaus.rostock.de/sixcms/media.php/rostock_01.a.396.de/datei/Rostock%20in%20Zahlen%202018_endg%C3%BCltig.pdf); 2019-04-30].
- Hansestadt Rostock (2012):** Befragung zum Mobilitätsverhalten in der Hansestadt Rostock und im Umland 2012 [[http://www.radregion-rostock.de/fileadmin/downloads/Befragung\\_zum\\_Mobilitaetsverhalten.pdf](http://www.radregion-rostock.de/fileadmin/downloads/Befragung_zum_Mobilitaetsverhalten.pdf); 2019-04-30].
- Hansestadt Rostock (2015):** System repräsentativer Haushaltsbefragungen (SrV 2013) Mobilität in Städten, Befragungsjahrgang 2013 [[http://www.radregion-rostock.de/fileadmin/migrated/content\\_uploads/SrV\\_2013\\_HRO\\_Kurzfassung.pdf](http://www.radregion-rostock.de/fileadmin/migrated/content_uploads/SrV_2013_HRO_Kurzfassung.pdf); 2019-04-30].
- Hansestadt Rostock (2016):** Statistische Nachrichten, Bevölkerungsprognose bis 2035  
[[https://rathaus.rostock.de/sixcms/media.php/rostock\\_01.a.396.de/datei/Bev%C3%B6lkerungsprognose%20bis%202035.pdf](https://rathaus.rostock.de/sixcms/media.php/rostock_01.a.396.de/datei/Bev%C3%B6lkerungsprognose%20bis%202035.pdf); 2019-04-30].
- Hensher, D. (2006):** Some Insights into the Key Influences on Trip-Chaining Activity and Public Transport Use of Seniors and the Elderly, in: International Journal of Sustainable Transportation Volume 1, 2007 - Issue 1.
- Higgs, G. (2017):** Modelling spatial access to General Practitioner surgeries: Does public transport availability matter? In: Journal of Transport & Health Volume 6, September 2017, Pages 143-154 [<https://www.sciencedirect.com/science/article/pii/S2214140516303243>; 2018-03-15].
- Jagiello, A. & Wojtach, A. & Łuczak, A. (2018):** INTERCONNECT REPORT Benchmarks for the current public transport systems [<http://www.interconnect.one/images/PDFs/report-Interconnect-4-1.pdf>; 2019-04-12].
- Kantar Emor (2018):** Microsoft PowerPoint - 02\_AS Kanter EMOR  
[[https://www.mnt.ee/sites/default/files/02\\_as\\_kantar\\_emor.pdf](https://www.mnt.ee/sites/default/files/02_as_kantar_emor.pdf); 2019-04-30].
- Karlskrona Kommun (2019):** Befolkningsutveckling - 1:a kvartalet 2019 (2019)  
[<https://www.karlskrona.se/globalassets/kommun-och-politik/det-har-ar-karlskrona/dokument/befolkning-forsta-kvartalet-2019.pdf>; 2019-06-03].
- Klaipeda Sustainable Mobility plan (2017):** [<https://www.klaipeda.lt/lt/teritoriju-planavimas/urbanistinio-planavimo-programa/klaipedos-miesto-darnaus-judumo-planas/3611>; 2019-04-14]
- Lachapelle, U. et al. (2011):** Commuting by Public Transit and Physical Activity: Where You Live, Where You Work, and How You Get There, in: Journal of Physical Activity and Health, 2011, 8(Suppl 1), S72-S82.
- Laconte (2002):** Smart Segments For Urban Public Transportation: An International Survey of Practices. In: Japan Railway & Transport Review 32 September 2002.
- Lapko, A. (2014):** Urban tourism in Szczecin and its impact on the functioning of the urban transport system, in: Procedia - Social and Behavioral Sciences 151 (2014) 207 – 214.
- Le-Klähn, D. & Gerike, R. & Hall, C. (2014):** Visitor users vs. non-users of public transport: The case of Munich, Germany, in: Journal of Destination Marketing & Management 3 (2014) 152–161.

- Le-Klähn, D. & Hall, C. (2014):** Tourist use of public transport at destinations – a review. In: Current Issues in Tourism, Volume 18, 2015 - Issue 8, p. 785-803 [<https://doi.org/10.1080/13683500.2014.948812>; 2019-06-28].
- Lithuanian Airports (2018):** LOU 2018 Aviation Statistics Overview, [<https://www.ltou.lt/en/about-lithuanian-airports>; 2019-08-24].
- Lithuania Travel/Ministry of Economy and Innovation (2018):** Tourism in Lithuania 2018, [<https://www.lithuania.travel/en/news/tourism-statistics>; 2019-05-20].
- Lithuanian Department of Statistics (2008):** Social and demographic characteristics of Klaipeda county [[http://regionai.stat.gov.lt/pdf/klaipedos%20apskritis\\_socdemas\\_11\\_25.pdf](http://regionai.stat.gov.lt/pdf/klaipedos%20apskritis_socdemas_11_25.pdf); 2019-05-16]
- Lithuanian Railways (2019):** Train lines in Lithuania. Source Lithuanian Railways [[https://www.traukiniobilietas.lt/portal/attachments/27281/LG\\_MAP\\_4.svg](https://www.traukiniobilietas.lt/portal/attachments/27281/LG_MAP_4.svg); 2019-06-08]
- Lokaltog (2019):** Køreplaner [<https://www.lokaltog.dk/media/1283/710r-lollandsbanen-saerkoereplan-2019.pdf>; 2019-06-20].
- Lumsdon, L. & Downward, P. & Rhoden, S. (2006):** Transport for Tourism: Can Public Transport Encourage a Modal Shift in the Day Visitor Market? In: Journal of Sustainable Tourism Volume 14, 2006 - Issue 2, p. 139-156 [<https://doi.org/10.1080/09669580608669049>; 2019-06-28].
- Lyons, G. (2004):** Transport and society, in: Transport Reviews, Volume 24, 2004 - Issue 4, 485-509.
- Mann, E., & Abraham, C. (2006):** The role of affect in UK commuters' travel mode choices: An interpretative phenomenological analysis, in: British Journal of Psychology, 97, 155-176.
- Mazouzi, M. & Cihon, M. & Warszycki, P. (2018):** INTERCONNECT Project Report on Policies, Projects and Best Practices [<https://drive.google.com/open?id=1umgebBxYwdbtHg-6G6RtDO02wAGVco0L>; 2019-03-12].
- Ministerium für Landwirtschaft, Umwelt und Verbraucherschutz Mecklenburg-Western Pomerania (2010):** Regelwerk Küstenschutz Mecklenburg-Western Pomerania [[http://service.mvnet.de/\\_php/download.php?datei\\_id=10879](http://service.mvnet.de/_php/download.php?datei_id=10879); 2019-04-12].
- Ministerium für Wirtschaft, Arbeit und Tourismus (2008):** Luftreinhalte- und Aktionsplan für die Hansestadt Rostock [[https://www.lung.mv-regierung.de/umwelt/luft/archiv/lrp\\_hro\\_091008.pdf](https://www.lung.mv-regierung.de/umwelt/luft/archiv/lrp_hro_091008.pdf); 2019-04-12].
- Ministry of Economy and Innovation (2018):** Lithuanian Tourism strategy 2016-2020 [[www.tourism.lt/uploads/documents/VTD%20rinkodaros%20strategija.doc](http://www.tourism.lt/uploads/documents/VTD%20rinkodaros%20strategija.doc); 2019-05-22] Strategic Development plan for years 2013-2020
- Movia (2017):** Guldborgsund-Kommunekort [<https://www.moviatrafik.dk/media/6076/guldborgsund-kommunekort.pdf>; 2019-06-20].
- Movia (2019):** Movia - Om os [<https://www.moviatrafik.dk/om-os>; 2019-06-20].
- MURRAY, A. et al. (1998):** PUBLIC TRANSPORTATION ACCESS, in: Transportation Research Part D, Vol. 3, No. 5, pp. 319-328.
- NDR (2019):** Rostock, district and city area, [[https://www.ndr.de/nachrichten/Mecklenburg-Western-Pomerania/mvkreise101\\_v-contentgross.jpg](https://www.ndr.de/nachrichten/Mecklenburg-Western-Pomerania/mvkreise101_v-contentgross.jpg); 2019-04-12]
- NetPort Science Park (2019):** [<https://www.netport.se/en/about-netport/>, 2019-06-20].

- Nykøbing F. Turistinformation (2014):** Turistfoldernettet [<https://www.aabne-samlinger.dk/media/400819/Turistfoldernettet.pdf>; 2019-04-30].
- OECD (2019):** OECD Territorial Reviews: Småland-Blekinge Monitoring Progress and Special Focus on Migrant Integration. OECD Publishing Paris. [<https://doi.org/10.1787/9789264311640-en>; 2019-06-28].
- Official Statistics Portal (2015):** Transport in Lithuania 2015 [<https://osp.stat.gov.lt/en/informaciniai-pranesimai?eventId=140181>; 2019-04-14]
- Pas, E. & Huber, J. (1992):** Market segmentation analysis of potential inter-city rail travellers. In: Transportation 19 (1992): 177-196.
- Planungsverband Rostock (2016):** Bevölkerungsprognose 2030 Stadt-Umland-Raum Rostock [[https://www.planungsverband-rostock.de/wp-content/uploads/2018/07/Bevoelkerungsprognose\\_SUR\\_Rostock.pdf](https://www.planungsverband-rostock.de/wp-content/uploads/2018/07/Bevoelkerungsprognose_SUR_Rostock.pdf); 2019-04-30].
- Planungsverband Rostock (2017):** Bevölkerungsprognose 2030 Landkreis Rostock [[https://www.landkreis-rostock.de/landkreis/daten\\_fakten/Bevxlkerungsprognose\\_2030\\_LK\\_Rostock.pdf](https://www.landkreis-rostock.de/landkreis/daten_fakten/Bevxlkerungsprognose_2030_LK_Rostock.pdf); 2019-04-30].
- Planungsverband-Rostock (2019):** Fakten - Planungsverband Region Rostock [<https://www.planungsverband-rostock.de/region/fakten/>; 2019-04-30].
- Pomorska Regionalna Organizacja Turystyczna (2018):** Gospodarka turystyczna regionu pomorskiego, Sprawozdanie 2017, [[https://www.prot.gda.pl/wp-content/uploads/2018/06/Sprawozdanie\\_2017.pdf](https://www.prot.gda.pl/wp-content/uploads/2018/06/Sprawozdanie_2017.pdf); 2019-05-26].
- Port of Klaipeda (2019):** Port statistics | Port of Klaipeda.lt [<https://www.portofklaipeda.lt/index.php?page=port-statistics>; 2019-06-28].
- Rahman, M. et al. (2016):** Transportation alternative preferences of the aging population, in: Travel Behaviour and Society 4 (2016) 22–28.
- Rebus (2019 a):** Verkehrsgebiet [<https://www.rebus.de/index.php?p=verkehrsgebiet.htm>; 2019-05-29].
- Rebus (2019 b):** Aufgaben [<https://www.rebus.de/index.php?p=aufgaben.htm>; 2019-05-29].
- Rebus (2019 c):** Vorstellung [<https://www.rebus.de/index.php?p=vorstellung.htm>; 2019-05-29].
- Rodney (2003):** Sustainable Transport: Planning for Walking and Cycling in Urban Environments, p.13.
- Rostock Business (2013):** Immobilienbericht der Hansestadt Rostock [<https://www.rostock-business.com/files/rb/download/Immobilienbericht%202015.pdf>; 2019-04-12].
- Rostock Port (2019):** Main Cargoes | Rostock Port - Hafen Rostock [<https://www.rostock-port.de/en/rostock-port/key-facts-figures/main-cargoes.html>; 2019-04-30].
- RSAG (2019):** RSAG in Zahlen und Fakten [[https://www.rsag-online.de/fileadmin/media/PDF/PDF\\_Flyer\\_ZahlenFakten-2019.pdf](https://www.rsag-online.de/fileadmin/media/PDF/PDF_Flyer_ZahlenFakten-2019.pdf); 2019-03-12].
- Saar, I. (2018):** Viimsi Vallavalitsus [Presentation given during the study visit and seminar in Viimsi 2018-10-01 – 2018-10-03 (INTERCONNECT activity 4.6)].
- Schlag, B. & Schwenkhagen, U. & Trankle, U. (1996):** TRANSPORTATION FOR THE ELDERLY: TOWARDS A USER-FRIENDLY COMBINATION OF PRIVATE AND PUBLIC

TRANSPORT, in: Journal of International Association of Traffic and Safety Sciences, p. 75-82 [<https://trid.trb.org/view/481457>; 2018-03-15].

**Sejm Rzeczpospolitej Polskiej (1999):** Dz.U. 1998 nr 96 poz. 603, [<http://prawo.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU19980960603>; 2019-03-21].

**Shergold, I. & Lyons, G. & Hubers, C. (2015):** Future mobility in an ageing society—Where are we heading? In: Journal of Transport&Health 2 (2015) 86–94.

**Simpson, B. (1994):** Urban Public Transport Today. London.

**Spiekermann & Wegener (2013 a):** *Transport Accessibility at Regional/Local Scale and Patterns in Europe, Final report* [[https://www.espon.eu/sites/default/files/attachments/TRACC\\_FR\\_Volume2\\_ScientificReport.pdf](https://www.espon.eu/sites/default/files/attachments/TRACC_FR_Volume2_ScientificReport.pdf); 2019-05-19].

**Spiekermann & Wegener (2013 b):** Transport Accessibility at Regional/Local Scale and Patterns in Europe, Poland case study, p.18/19 [[https://www.espon.eu/sites/default/files/attachments/TRACC\\_FR\\_Volume3\\_PartE.pdf](https://www.espon.eu/sites/default/files/attachments/TRACC_FR_Volume3_PartE.pdf); 2019-05-19].

**Statistics Sweden, SCB, (November 2018):** Number of commuters in Blekinge 2017. [<https://www.scb.se/en/finding-statistics/statistics-by-subject-area/labour-market/employment-and-working-hours/labour-statistics-based-on-administrative-sources/pong/tables-an>, 2019-06-25].

**Statistisches Amt Mecklenburg-Vorpommern (2018):** Statistisches Jahrbuch Mecklenburg-Western Pomerania 2018. Schwerin.

**Stena Line (2018a):** Karlskrona - Gdynia, Development of Freight / Cars volumes (1995-2017) Stena Line Presentation, May 17, 2018.

**Stena Line (2018b):** Karlskrona - Gdynia, Development of guest's volumes (1995 – 2017) Stena Line Presentation, May 17, 2018.

**Sullivan, C. & O'Fallon, C. (2008):** Segmentation research for sustainable transport: do's and don't's. Paper presented at 32nd Australasian Transport Research Forum [[http://www.patrec.org/web\\_docs/atrf/papers/2009/1756\\_paper103-Sullivan.pdf](http://www.patrec.org/web_docs/atrf/papers/2009/1756_paper103-Sullivan.pdf)].

**Svensson, H. (2003):** The Public Transport Preferences of Elderly People; A study related to individual capacity and environmental stress in service route traffic and other systems. Doctoral Thesis, Department of Technology and Society, Lund University [<https://lup.lub.lu.se/search/publication/21260>; 2019-03-12].

**Thompson, K. & Schofield, P. (2007):** An investigation of the relationship between public transport performance and destination satisfaction, in: Journal of Transport Geography 15 (2007) 136–144.

**Truong, N. & Shimizu, T. (2016):** The effect of transportation on tourism promotion: Literature review on application of the Computable General Equilibrium (CGE) Model, in: Transportation Research Procedia 25 (2017) 3096-3115.

**United Nations (2019):** Department of Economic and Social Affairs, Population Division, World Population Prospects 2019, Highlights [[https://population.un.org/wpp/Publications/Files/WPP2019\\_Highlights.pdf](https://population.un.org/wpp/Publications/Files/WPP2019_Highlights.pdf); 2019-07-27].

**URBACT (2018):** Klaipeda's Integrated Action Plan 2018-2020 [[https://urbact.eu/sites/default/files/20180201\\_iap\\_klaipeda.pdf](https://urbact.eu/sites/default/files/20180201_iap_klaipeda.pdf); 2019-04-10]

- UrbiStat (2018a):** Province of Blekinge Inhabitants Trend  
[<https://ugeo.urbistat.com/AdminStat/en/se/demografia/popolazione/blekinge-lan/10/3; 2019-06-21>].
- UrbiStat (2018b):** Blekinge province age distribution by gender  
[<https://ugeo.urbistat.com/AdminStat/en/se/demografia/eta/blekinge-lan/10/3, 2019-06-21>].
- UrbiStat (2018c):** Average age in municipalities of province of Blekinge  
[<https://ugeo.urbistat.com/AdminStat/en/se/classifiche/eta-media/comuni/blekinge-lan/10/3, 2019-06-21>].
- Visit Lolland-Falster (2019 a):** Marielyst | Badebyen med Danmarks bedste strand | #marielyst | #marielyst strand [<https://www.visitlolland-falster.dk/marielyst; 2019-04-30>].
- Visit Lolland-Falster (2019 b):** Top Attractions on Lolland-Falster | Visitlolland-falster  
[<https://www.visitlolland-falster.com/In-int/lolland-falster-top-attractions; 2019-04-30>].
- Visit Lolland-Falster (2019 c):** Cycling routes on Lolland-Falster | Visitlolland-falster  
[<https://www.visitlolland-falster.com/In-int/cycling-routes-on-lolland-falster; 2019-04-30>].
- VisitBlekinge (2019):** [<https://www.visitblekinge.se/en, 2019-06-18>].
- VVW (2016 a):** Statistik Verkehrsverbund Warnow VVW Verbundgebiet  
[<https://www.verkehrsverbund-warnow.de/vvw/statistik.html; 2019-03-12>].
- VVW (2016 b):** Wir bringen Sie zusammen. Verkehrsverbund Warnow [[https://www.landkreis-rostock.de/kreistag/sitzungsvorlagen/familie-jugend-senioren-soziales-gesundheitsausschuss-sitzungsunterlagen/2016/2016-11-07/07-Anhang\\_Protokoll\\_2016.09.26.-Sozialausschuss\\_des\\_LRO\\_-\\_Verstellung\\_VVW.pdf; 2019-05-20](https://www.landkreis-rostock.de/kreistag/sitzungsvorlagen/familie-jugend-senioren-soziales-gesundheitsausschuss-sitzungsunterlagen/2016/2016-11-07/07-Anhang_Protokoll_2016.09.26.-Sozialausschuss_des_LRO_-_Verstellung_VVW.pdf; 2019-05-20)].
- VVW (2019):** Netzplan Region [[https://www.verkehrsverbund-warnow.de/downloads.html?file=files/downloads/VVW-Netzplan\\_Region.pdf; 2019-04-30](https://www.verkehrsverbund-warnow.de/downloads.html?file=files/downloads/VVW-Netzplan_Region.pdf; 2019-04-30)].
- Wong, R. et al. (2017 a):** Elderly users' level of satisfaction with public transport services in a high-density and transit-oriented city, in: Journal of Transport & Health Volume 7, Part B, December 2017, Pages 209-217 [<https://doi.org/10.1016/j.jth.2017.10.004; 2019-03-12>].
- Wong, R. et al. (2017 b):** Public transport policy measures for improving elderly mobility, in: Transport Policy Volume 63, April 2018, Pages 73-79  
[<https://doi.org/10.1016/j.tranpol.2017.12.015; 2019-03-12>].



## / Partners



## / Associated partners



## / Further contact

Marco Mazouzi

Hanseatic Institute for Entrepreneurship and  
Regional Development at the University of  
Rostock (HIE-RO)

+49 381 498 56 28

[marco.mazouzi@hie-ro.de](mailto:marco.mazouzi@hie-ro.de)