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Writer: Annisa Solihah Sontani
Faculty supervisor: Professor Harald Nils Røstvik	
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PREFACE

This thesis is made as a completion of the master education in urban design, Department of Industrial Economics, Risk Management and Planning, University of Stavanger. It serves as a documentation of my research from September 2016 until January 2017. This study presents the relation between shopping centers, the neighborhoods, and sustainable transportation in the Stavanger region. This work is to the best of my knowledge original, except where acknowledgement and references are made to previous works.

Several persons have contributed academically to this thesis. I am extremely grateful to my supervisor, Professor Harald Nils Røstvik, for his endless support and advice throughout the entire master thesis process. I would thank to Anette Øfsti Worum for the friendliest interview while sharing some information about Madla AMFI. I would also thank to Elisabeth Schibevaag for letting me asked everything about Arkaden between her busy times. Furthermore, I am very delighted with the help from Harald Brynlund-Lima through the process of seeking information about city's regulation.

Finally, I take this opportunity to express my gratitude to my husband, my daughter, and the unborn baby for their unfailing encouragement during my study and my master thesis process in UiS.

Stavanger, January 2017

Annisa Solihah Sontani

ABSTRACT

The main aim of this thesis is to study how shopping centers in Stavanger region co-exist with the city, with special focus on the relationship between the shopping centers and the neighborhoods. In addition, the sustainability aspect is examined to this research in order to provide more comprehensive study. The problem statement relies on understanding how the integrated shopping centers relate to some aspects such as location, density, accessibility, sustainable transport, and to some extent, economy.

In order to comply with these objectives, the development of shopping centers in Stavanger region with their classification is generally discussed, and then some specific shopping centers were selected based on their distinct aspects mentioned above.

The discoveries show that the location and the existing neighborhood's condition influence the relation between the shopping centers and the neighborhoods. The shopping centers in a high density and a robust neighborhood indicate more integration and sustainable than the other shopping centers in the opposite situation. However, city regulations may help to reduce the risk of disintegration between shopping centers and the neighborhoods. This thesis concludes that shopping centers in Stavanger region have been attempting to integrate with the neighborhood and trying to achieve sustainable transportation.

This thesis is structured in 7 main chapters: (1) Introduction referring to objective and study case, (2) Methods on how the thesis will be conducted, (3) Literature review addressing the academic background about shopping centers' classification and the regulation of shopping center's development in Stavanger region. (4) Previous studies in Norway including Stavanger that serve information about the dynamic development of shopping centers and some aspects relates to it, (5) General discussion about shopping centers in most of the districts in Stavanger region, (6) In-depth discussion of the selected shopping centers, (7) Conclusion presenting the relevance of taking different approaches to the shopping centers on order to be able to integrate with the neighborhood and more sustainable.

CONTENTS

PREFACE	2
ABSTRACT	3
CONTENTS	4
LIST OF CHARTS	7
LIST OF FIGURES	9
LIST OF TABLES	11
1 INTRODUCTION	12
1.1 BACKGROUND	12
1.2 RESEARCH QUESTION	13
1.3 CASE STUDY	14
1.4 RESEARCH AREA.....	14
1.5 OBJECTIVES	14
2 METHODS	15
3 LITERATURE REVIEW	16
3.1 HISTORY, DEFINITION, AND CHARACTERISTICS OF SHOPPING CENTER.....	16
3.1.1 <i>History and definition</i>	16
3.1.2 <i>Characteristics of shopping centers</i>	20
3.2 PATTERN OF CENTERS IN A CITY	21
3.2.1 <i>Challenges for old city centers</i>	22
3.3 SHOPPING ACTIVITIES AND SUSTAINABLE MOBILITY	23
3.3.1 <i>What do people buy in shopping centers?</i>	23
3.3.2 <i>Sustainable mobility and shopping</i>	24
3.4 SHOPPING CENTERS POLICIES AND STRATEGIES IN DEVELOPING SHOPPING CENTERS	27
3.4.1 <i>Stavanger municipality</i>	28
3.4.2 <i>Forus-Lura, Sandnes</i>	29
4 PREVIOUS STUDIES – SHOPPING CENTERS IN NORWAY	31
4.1 SHOPPING CENTERS DEVELOPMENT	31
4.2 SHOPPING TRIPS	32
5 SHOPPING CENTERS IN THE STAVANGER REGION	37
5.1 TYPE OF SHOPPING CENTERS IN THE STAVANGER REGION	38
5.1.1 <i>Definition of a shopping centers for the research</i>	39
5.3 SHOPPING CENTERS AND POPULATION	42
5.4 DISTRICTS' TURNOVER AND TOTAL RETAIL IN 2015	45
5.5 SHOPPING CENTERS' VISITORS AND TURNOVER.	46
5.6 RETAIL GOODS SOLD IN THE DISTRICTS	48
5.7 SHOPPING CENTERS AND MOBILITY.....	49
5.8 THE REGIONAL SHOPPING CENTER AND THE TWO CITY CENTERS IN THE STAVANGER REGION.	50
5.9 CHARACTERISTIC OF THE SHOPPING CENTERS IN STAVANGER	51
5.9.1 <i>Physical aspect and surrounding area</i>	51

5.9.2	<i>Transportation networks</i>	52
5.9.3	<i>Stores and facilities in the shopping centers</i>	53
5.10	THE VIBRANT CITY CENTER IN THE REGION; ‘STAVANGER SENTRUM’	55
5.10.1	<i>Stavanger sentrum strength/assets</i>	56
6	THE MAJOR SHOPPING CENTERS IN STAVANGER REGION	59
6.1	ARKADEN, STAVANGER SENTRUM	59
6.1.1	<i>Physical characteristics</i>	60
6.1.2	<i>Facts</i>	60
6.1.3	<i>The surrounding area</i>	63
6.1.4	<i>Catchment area</i>	65
6.1.5	<i>Accessibility and transportation networks</i>	66
6.1.6	<i>Future development in relation to neighborhood development</i>	67
6.2	MADLA AMFI, STAVANGER	68
6.2.1	<i>Physical characteristics</i>	69
6.2.2	<i>Facts</i>	70
6.2.3	<i>The surrounding area</i>	72
6.2.4	<i>Catchment area</i>	74
6.2.5	<i>Accessibility and transportation networks (public transport must be available)</i> 75	
6.2.6	<i>Future development in relation to neighborhood development</i>	77
6.3	KVADRAT, SANDNES.....	78
6.3.1	<i>Physical characteristics</i>	79
6.3.2	<i>Facts</i>	80
6.3.3	<i>The surrounding area</i>	82
6.3.4	<i>Catchment area</i>	84
6.3.5	<i>Accessibility</i>	85
6.3.6	<i>Future development in relation to neighborhood development</i>	86
7	SHOPPING CENTERS AND A CITY	88
7.1	SHOPPING CENTERS AND THE NEIGHBORHOODS.....	88
7.2	THE SHOPPING CENTERS AND SUSTAINABLE TRANSPORTATION	90
8	CONCLUSION	93
	REFERENCES	96
	ABBREVIATIONS	99
	APPENDIX 1 DISTRIBUTION OF SHOPPING CENTERS, THE SIZES, AND POPULATION,	100
	APPENDIX 2 NUMBER OF POPULATION AND THE SIZES OF SHOPPING CENTERS	101
	APPENDIX 3 ANNUAL DAILY TRAFFIC IN STAVANGER REGION	102
	APPENDIX 4 BUSWAY NETWORKS, POPULATION, AND THE SHOPPING CENTER SIZES (M2)	103
	APPENDIX 5 LOCATION AND SIZE ALLOWANCE FOR A DISTRICT SHOPPING CENTER	104
	APPENDIX 6 BUILDING UNITS AROUND SHOPPING CENTERS	105

APPENDIX 7 - INTERVIEW ABOUT MADLA AMFI.....	106
APPENDIX 8 - INTERVIEW ABOUT ARKADEN	107
APPENDIX 9 - INTERVIEW ABOUT FORUS AND SANDNES DEVELOPMENT.....	109
APPENDIX 10 MADLA AMFI FACTSHEET 2016	110

LIST OF CHARTS

Chart 1 Travel distance (km) and shopping trips in Stavanger region. Source: RVU 2005/Asplan Viak 2007.	24
Chart 2 Modal shares by customers to different shopping areas in Stavanger Region. Source: SINTEF 2014.....	33
Chart 3 Geographical distribution of travel behavior in shopping centers. Source: SINTEF 2012	34
Chart 4 Travel pattern for shopping trips between three different shopping areas. Source: RVU2005/Asplan Viak 2007.....	35
Chart 5 Comparison between sizes of the shopping centers. Sources: Norgesdigitalt, and generated by ArcMap's software.....	40
Chart 6 Population and density in Stavanger region. Sources: SSB 2016	43
Chart 7 A relation of population and total gross area (m ²) of commercial building. Source: SSB 2016, Norgesdigitalt.....	44
Chart 8 Development of shopping centers and population in 2020. Source: TØI	45
Chart 9 Districts' turnover and total retail sold in 2015. Source Spare-Bank1 2015	45
Chart 10 The relation between district turnover and total GFA (m ²) of commercial buildings. Source: SSB 2015, Spare Bank 1 2014.....	46
Chart 11 The relation between turnover and a district's population	46
Chart 12 Number of visitors and turnover 2014/2015	47
Chart 13 The relation between Shopping centers' size, turnover and visitors. Sources: Factsheets, Spare Bank 1	48
Chart 14 Proportion of retail items sold in the districts. Source: Spare-Bank1 2015	48
Chart 15 Shopping centers' size and number of households in walking distance.....	49
Chart 16 Comparison of trading between the two city centers and the regional shopping center. Source: Spare-Bank 1	50
Chart 17 Number of stores and BRA (m ²). Source: The shopping centers' sheetfacts.	54
Chart 18 Number of parking and BRA (m ²). Source: The shopping centers' sheetfacts.	54
Chart 19 Retail allocation in Stavanger sentrum. Source: Spare-Bank1 2015.....	61
Chart 20 Turnover Stavanger sentum and Arkaden shopping center. Source: Spare-Bank1 2015, Arkaden factsheet 2015.....	62
Chart 21 Adjacent buildings, except housing, around Arkaden shopping center in raidus 800 m and 2 km. Sources: Norgesdigitalt, ArcMap software.	63
Chart 22 Madla district retail allocation. Source Spare-Bank1 2015.....	71
Chart 23 Turnover in Madla district and Madla AMFi. Source: Spare-Bank1 2015 and Madla Amfi factsheet.	71

Chart 24 Adjacent buildings, except housing, around Madla AMFI in radius 800 m and 2 km. Sources: Norgedigitalt, ArcMap software.	73
Chart 25 Lura district's retail allocation. Source: Spare-Bank1 2015	80
Chart 26 Turnover in Lura district and Kvadrat. Source: Spare-Bank1 2015 and Kvadrat factsheet	81
Chart 27 Adjacent buildings, except housing, around Kvadrat shopping center in radius 800 m and 2 km. Source: Norgedigitalt, ArcMap software.	83
Chart 28 Shopping centers, population, and building sizes	89

LIST OF FIGURES

Figure 3-1 Abstract model of a typical urban subunit. By: Victor Gruen. 1973.....	21
Figure 3-2 Model of a transportation node. Source: Victor Gruen. 1973.....	22
Figure 3-3 The influence of travel chains on the total travel demand in cities, translated from R.Monheim (1985a, p.268) (as cited in Hillnhutter, 2016, p.15).....	27
Figure 3-4 Structure of centers for long term development of Stavanger region. Source TØI. 2010	30
Figure 4-1 Shopping centers in Stavanger region 2000-2006. Source: Asplan Viak. 2007	31
Figure 5-1 Distribution of center areas in Stavanger region. Sources: Norgedigitalt and ArcMap software.....	37
Figure 5-2 Shopping centers and the district centers area (R=800 m). Source: Norgedigitalt, ArcMap	42
Figure 5-3 Number of population and the size of shopping centers. Source: Norgedigitalt, ArcMap.....	43
Figure 5-4 Kvadrat shopping center. Source: Sandnesposten.	51
Figure 5-5 Madla AMFI shopping center. Source: Olav Thon Eindom.....	51
Figure 5-6 Shopping centers' neighborhoods and the main transportation networks. Sources: Norgedigitalt, ArcMap software.....	52
Figure 5-7 Annual Daily Traffic in Stavanger region (see Appendix 3). Sources: Norgedigitalt, ArcMap software.....	52
Figure 5-8 Busway networks, population, and the shopping centers' sizes (m ²) (see Appendix 4). Sources: Norgedigitalt, ArcMap software	53
Figure 5-9 The festivity during 'Gladmat' international food festival in Stavanger sentrum.	56
Figure 6-1 Arkaden shopping center's buildings.....	60
Figure 6-2 Arkaden neighborhood and the pedestrian street (A).....	63
Figure 6-3 Building functions in Stavanger sentrum. Sources: Norgedigitalt, ArcMap software.....	64
Figure 6-4 Neighborhoods situation in Stavanger sentrum. Sources: Personal photos, Google maps	64
Figure 6-5 Distribution of population in Stavanger sentrum area and the location of Arkaden. Souces: Norgedigitalt, ArcMap software.....	65
Figure 6-6 Stavanger sentrum population, transportation networks, and busway catchment area (200 m). Sources: Norgedigitalt and ArcMap software.....	66
Figure 6-7 Types of roads in Arkaden's neighborhood. Sources: Norgedigitalt, ArcMap	67

Figure 6-8 Madla AMFI's building block and its main entrances.....	69
Figure 6-9 Madla AMFI and its potential physical barriers.....	72
Figure 6-10 Building functions around Madla AMFI. Sources: Norgedigitalt, ArcMap software.....	73
Figure 6-11 Neighborhood situation around Madla AMFI. Sources: Personal photos, Google maps.	74
Figure 6-12 Distribution of population around Madla AMFI. Sources: Norgedigitalt, ArcMap software	74
Figure 6-13 Madla district's population and transportation networks. Sources: Norgedigitalt, ArcMap software.....	76
Figure 6-14 Types of roads in Madla AMFI's neighborhood. Sources: Norgedigitalt, ArcMap.....	77
Figure 6-15 Madla AMFI development plan. Source: Alliance Arkitekter.....	77
Figure 6-16 Forus map. Sources: Norgedigitalt, Forusvisjonen.no.....	78
Figure 6-17 Kvadrat shopping center aerial view.....	79
Figure 6-18 Kvadrat shopping center and the potential physical barriers	82
Figure 6-19 Building functions around Kvadrat. Sources: Norgedigitalt, ArcMap software.....	83
Figure 6-20 Neighborhood situation around Kvadrat. Sources: personal photos, Google maps.....	84
Figure 6-21 Distribution of population in Kvadrat's area and the center's border	84
Figure 6-22 Lura district population and transportation infrastructure.....	85
Figure 6-23 Types of roads in Kvadrat's neighborhood. Sources: Norgedigitalt, ArcMap	86
Figure 6-24 New development area (in red) of Kvadrat shopping center. Source: skycrapercity.no	87
Figure 7-1 Distribution of commercial areas and work place hubs in Stavanger region. Source: Norge digital and ArcMap software.....	91

LIST OF TABLES

Table 1 Turnover of various categories of goods in Rogaland county (1000kr). Source: Spare-Bank1. 2015.	23
Table 2 Turnover of shopping goods in Stavanger region (Stavanger, Sola, Sandnes, Randaberg, Rennesøy) (1000kr). Source: Spare-Bank1. 2015.	24
Table 3 Turnover of shopping goods in Stavanger city center (1000kr). Source: Spare-Bank1. 2015.....	24
Table 4 Acceptable distances for pedestrian/cyclist. (Buskerud fylkeskommune 2003)	25
Table 5 Turnover of shopping goods in Lura district, Sandnes (1000kr).....	32
Table 6 Turnover of shopping goods in Sandnes city center (1000kr).....	33
Table 7 Shopping trips in Jæren. Source Asplan Viak 2007	35
Table 8 Shopping centers in Stavanger district.....	40
Table 9 Centers conditions, visitor, and turnover. Source: the shopping centers' factsheet.....	90
Table 10 Shopping centers and transportations choices	91

1 INTRODUCTION

1.1 Background

The new generation of shopping centers was developed during the late 1950s in the US. Unlike any former types of commercial buildings such as open-air arcades or strip malls, shopping centers in the 1950s were characterized by massive building boxes with huge parking spaces around. The shopping centers at that time were standardized, air-conditioned, and designed in a particular way so that people would stay longer inside. The buildings are introvert because all activities are turned inward. This type of shopping center was immediately spread across the world including Norway. Since then, the characteristics of the shopping centers have not changed much.

The shopping centers mentioned above are also disintegrated with outside environment such as sidewalks and streets. One of the reasons of separating them is because the shopping centers want to create distinctive spaces inside the buildings without any distractions from outside. Therefore, people will focus on shopping and spending time inside the shopping centers. Shopping centers are parts of urban retail in a city that provide goods and services based on the people's demands. They contribute to the economy viability, pulsating trading activity, and absorb employment.

Classifications of shopping centers are depending on scales and sizes. Margaret Crawford (1992) explained that scales and sizes of shopping centers reflect the "threshold demand" of the minimum member of potential customers living within the geographical range of a retail item to enable it to be sold at a profit. She categorized them as neighborhood or district centers, community centers, regional centers, and super regional centers. In the Stavanger region, shopping centers are distributed in every district in the cities. The developments are concentrated in the district center known as *bydelsenter/lokalsenter*. The principle of a district center is to provide goods and services mainly for the people who live within the district. Typically, a shopping center consists of one or two anchor stores and several smaller stores. However, most of the anchor stores in Stavanger shopping centers are big grocery stores meanwhile in US, an anchor store is a major retail chain or a department store that offers a wide range of consumer goods. The regulation for a district shopping center's development is clearly stated in *Plan- og bygningsloven* or Planning and Building Act. It explains the allowed size of a shopping center's gross leasable area (*bruksareal/BRA*). There is also a big regional shopping center located in the periphery of the Stavanger city that offers a wider range of goods that is able to serve a larger number and more various types of customers.

Shopping center's buildings shield their visitors from changing weather. Public amenities such as toilets, sitting area, and cafes are often available in the shopping centers. Some big shopping centers even offer an attractive social function such as food court, ice skating rink, movie theater, etc. These functions might redirect people from visiting a city center towards a shopping center. In consequence, many city centers have lost their visitors and many people have claimed that the new shopping centers' development has deteriorated the city centers. However, in Stavanger, the strict policy of a shopping center's expansion may have helped restrain that occurrence. But at the

same time, a district shopping center still needs to be developed and expanded in order to attract more visitors and thus increase its revenues.

Shopping centers attempt to provide attractive places for shopping as well as socializing for both people who live inside and outside the neighborhood. However, the number of trips and travel distances by visitors from the outside neighborhood may increase the traffic and private car use. The large amount of private cars in a neighborhood will restrain the city from achieving its sustainability goal. Besides, the traffic situation could also bother inhabitants who live in the shopping center's precinct. Therefore, it is very important to consider the impacts of the shopping centers' development.

Shopping centers should have a parking facility. It is up to the management whether or not the parking is free of charge. A free parking shopping center may attract more visitors who use private cars. It also determines how long the visitors will stay at a shopping center. Many visitors use private cars because it is the most convenient mode of transportation for shopping trips. Using cars helps visitors bring all their shopping goods back home. However, too many private cars contribute to an unsustainable development. Therefore, Stavanger city has planned to upgrade the public transportation system and promote the use of non-vehicular transport modes in order to minimize the use of private cars.

Development of a residential area should be at high enough densities to create viability for local services (Banister, 1997). Local services are represented by shopping centers or other commercial buildings, mixed-use buildings, and business functions. These services should be supported by good pedestrian and public transport accessibility. *Transportøkonomisk institutt/TØI* or Institute of Transport Economics (2010) explained that a shopping center in a dense center area has a lower proportion of private car use compared to a shopping center in a rural area, which has a proportion of cars at over 95%.

Nevertheless, the realm of shopping centers in a city always depends on the relation between its people and the physical urban spaces. Yet the overall goal is to maintain the viability of the city without investing in a harmful effect for future generations.

1.2 Research question

Based in the introduction, the shopping centers have developed in certain ways resulting in buildings that have become separate and independent entities within the neighborhoods. From that hypothesis, the research question:

How do shopping centers in Stavanger region relate to their neighborhood?

The high number of private car use for shopping trips contributes to an unsustainable development. This problem statement leads to the question:

To what extent do shopping centers relate to sustainability, specifically regarding mobility?

This investigation focuses on shopping centers in different areas in Stavanger such as city centers, district centers, and rural/periphery of the city. Prior to that, a general discussion on shopping centers in the whole Stavanger region will be presented.

1.3 Case Study

Shopping centers in the Stavanger region are the case study of this research. Stavanger region in this research consists of 4 municipalities; Randaberg, Stavanger, Sola, and Sandnes. However, chapter 5 only focuses on shopping centers in Stavanger and Sandnes. These municipalities are chosen due to their significance in influencing urban development in the region.

There are some restricted data that were not accessible or possible to obtain such as customers' data, transportation choices by visitors and the shopping centers' periodic turnover. Neither did the shopping centers allow customer surveys to be conducted within their premises. As a consequence this research has made use of adapted reliable and relevant data sources from previous researches carried out by SINTEF, TØI, SIFO, Asplan Viak, Spare Bank1, Staten Vegvesen, and municipality documents.

1.4 Research area

The main area of the investigation is shopping centers' development in the Stavanger region particularly in three different administrative contexts; city center, district center, and rural area. It then delves into typology /physical aspects such as existing physical condition and future development, relation to the inhabitants nearby, infrastructure and transportation, and types of land use in the surrounding area. More detailed aspects such as parking spaces, turnover, number of visitors, types of retail will also be discussed in this research.

The research will be based on theoretical study of shopping centers, city, and sustainable mobility. The literature will further be coordinated with on-site surveys and interviews with shopping center's management and an urban planner from Sandnes.

1.5 Objectives

The research about Shopping Centers in a City will give insight about the existing shopping centers' condition and the impacts to the neighborhood and the city. It will also provide information about the actual city's policies on managing shopping centers' development. Further on, the research will be juxtaposed with recent issues about sustainability. In the same time, the research is expected to address a derelict city center that often happens due to the new development of a shopping center. The outcome will promote local/nearest shopping centers as the local inhabitants' main shopping destination and also encourage people to use sustainable transport for their shopping trips. Nevertheless, the overall goal is to integrate of shopping centers and a city, regenerate local shopping centers based on the distinction of its neighborhood in order

to create more inclusive surroundings, and to achieve sustainable transportation for shopping trips.

2 METHODS

The research will be conducted by descriptive-qualitative methods, which involves observation of the study case. Further analysis, a descriptive-quantitative method is needed as the study involves numerical data about merchants in the shopping centers, density of the neighborhoods, proximity measurements, and other statistics. The data is presented through maps and tables containing the data as the form of numbers and statistics. These methods are combined in order to get reliable results. In addition, this research involves interviews with the management of the shopping centers and the urban planner of Sandnes.

The data sources are mostly numerical and observation-based information about shopping centers within the Stavanger Region specifically in the districts of Stavanger sentrum or the city center, Madla, and Lura. The Stavanger region, in this research, consists of the 4 municipalities Randaberg, Stavanger, Sola, and Sandnes. Precondition of shopping centers to be investigated in this research are commercial buildings that have at least 5000 m² of BRA, and have over 10 stores. These numbers are used as a threshold for this research for reason of practicality. Stavanger city plan from GisLine (online data) will support the investigation. Below is an explanation of the data gathering process:

1. Collect quantity data about 3 shopping centers including their turnover, number/type of stores, particular information about its visitors, type of transport modes used by the visitors, and data about the neighborhood in the surrounding areas.
2. Investigate the history of the shopping centers' development.
3. Investigate each shopping center based on literature references.
4. Observe the typology and other distinctive physical characteristics.
5. Observe the neighborhood; access for pedestrian, cars, and public transport.
6. Observe the neighborhood in walkable radius from particular shopping centers. This comprises types of neighborhood and density.
7. Compare shopping centers from different districts.

The information collected will be linked to previous researches carried out by city official institutions or survey organizations. The quantitative data and maps will be processed by ArcMap software, which cultivate Geographical Information System (GIS) and eventually yield map graphic and tables/charts.

3 LITERATURE REVIEW

3.1 History, definition, and characteristics of shopping center

3.1.1 History and definition

The new development of shopping centers in the US happened in the late 1950s. It was contributed to Victor Gruen, an architect best known as pioneer in the design of shopping center in US. His major work was to develop an enclosed shopping center located in the periphery of the city as people call it regional shopping center. It consists of several merchants that offer a wide range of goods and services. He also designed shopping centers with leisure functions such as a water-park, ice skating rink, movie theater, etc. His projects transformed people's perception of shopping centers from having a single function into shopping centers having multiple functions in addition to shopping. His shopping centers' design have been adapted to most shopping centers across the world and have also influenced urban development patterns in cities for example sprawling patterns of urban settlements.

Margaret Crawford (1992) explained that shopping centers introduce a variety of services that attract many visitors. Services such as a movie theater, ice-skating rink, video-game rooms, and fast-food arcades signaled the shopping centers' expanded recreational roles. The availability of toilets, nursery rooms, and disable access make visitors feel comfortable being inside the shopping centers. The attractive services and facilities provided by shopping centers will make the visitors stay longer and purchase more.

Shopping centers in the US have become centers for social interaction. The centers serve as the hub for recreation, public life, and social interaction in addition to commercial activities.

Below are US predecessors to current regional shopping centers:

1. Shopping villages (1930-1940). The design was integrated with communities and functioned as cores for the new development. It does not have "anchors" shop, main shops among others, but only smaller merchandise.
2. Stripped malls started to develop during the postwar period. Here, each store stands next to each other, creating a linear configuration and with open access to anyone from the street adjacent to the stores. This triggered to "go back" to the 19th century arcade, which has more convenient access for customer, because the street had become hostile.
3. Regional shopping centers bloomed during the 1960s. This type of shopping center was an enclosed building that protected its customers from changing weather conditions. The façade was plain and the shopping center focused inward, turning its back to the public street. Most people travel to a regional shopping center by car therefore it is equipped with a giant parking lot surrounding the center. Merchants in the downtown city center tempted to "open branches" in suburban areas in order to gain revenue with lower rent

price and tax. People move from the city to regional shopping centers and thus this phenomenon affects the livability of the downtown city center.

Margaret Crawford (1992) also described about “participants’ of a shopping center as follows:

1. One or more large department stores (approximately 5500 – 35000 square meter) as an “anchor”. In the US a department store is a collection of stores satisfying all possible human needs under one roof (sale food is an exception). Meanwhile in Europe sale food is often represented in a department store. The anchors provide functional poles of attraction for shoppers.
2. Secondary sizes of shopping units are either junior department stores or branches of large chain stores.
3. Supermarket, which offers more goods than local/neighborhood supermarkets.

In Britain, shopping centers development started earlier than in the US;

1. Open-air piazza shopping center (The Royal Exchange, 1571) is the Britain’s first shopping center with 100 different stores in a two-storey building.
2. Early stage of supermarket (Sainsbury’s in London, 1869). It was a market selling dairy products. Today, Sainsbury’s is one of the biggest supermarket chains in Britain.
3. Early stage of department store (Marks and Spencer in Leeds, 1884). It was a small retail business. A century later, it became the country’s most successful retail business.
4. Early stage of out-of-town shopping center or regional shopping center (London’s Brent Cross, 1976). It had 86 shops and 5000 parking lots in order to cater to a car-owning Britain. Apparently, this type of shopping center adapted the shopping centers’ in the US.

In the UK, Michelle Lowe (2005) said that the concept of shopping centers in the UK owes its origins to the pioneering work of Victor Gruen. On the other hand, she mentioned that UK shopping centers are different from the US shopping centers. They were used as “a vehicle enlarging and modernizing central area shopping” rather than were developed as freestanding suburban facilities as it happened in the US.

There are several definitions on recognizing shopping centers. Based on European Journal Marketing by Jonathan Reynolds (1992), there are at least three kinds of purpose-build centers, broadly related to the size of market served:

1. Centers serving a “regional” market
2. Centers serving a broad range of community or district needs
3. Local neighborhood centers.

In the meantime, Margaret Crawford (1992) described the size and scale of a shopping center:

1. Neighborhood centers must serve local markets within 2 miles radius
2. Community center should cover 3-5 miles radius.
3. Regional malls must have at least two department stores and hundred shops to attract customers from 25 miles away.
4. Super regional malls have at least five department stores and up to 300 shops. The coverage area is approximately 100 miles.

Robert. J. Gibbs (2012) explained that in a perfect retail theory, retail offerings would balance consumer's demand in one area, for example a shopping center would provide the exact brands, goods, prices, and services desired and needed by their communities nearby. Therefore, people would only have to walk or drive shortly to the most of the preferred stores. He also defined types of shopping centers. Each type of center appeals to a particular market segment through its tenant types, size ranges, location criteria, and site plan standards.

1. Corner store. This store is the smallest and most useful retail type of center and ranges from 150-300 square meters in GLA (Gross Leasable Area - the amount of floor space available to be rented in a commercial property). This store offers the beverages and food local workers/travelers need on a regular basis.
2. Convenience center: The convenience center is typically between 1000-3000 square meters in GLA. The convenience center offer an array of goods and services geared to the daily needs of its surrounding neighborhood. Often including a small specialty food market or pharmacy. The convenience center's primary economic advantage is its close location to residences, allowing the time-pressed shopper to make a quick purchase on the way to or from home.
3. Neighborhood center: The neighborhood center is 5000-7000 square meters in including its supermarket. It is considered the core of the traditional neighborhood and a staple of the shopping center industry. Anchored with a supermarket, pharmacy, and restaurant, a neighborhood center offers the complete array of goods and services needed by households on a regular basis but not available at smaller or larger centers. The neighborhood centers primary anchor is a full-sized supermarket, typically 4500-6000 square meters in area. This anchor is the commercial engine that supports most of the center's other shops. When a supermarket closes, many of those businesses will immediately suffer sharp declines in sales and be forced to close or relocate. To be economically sustainable, a neighborhood center needs 6000 - 8000 households within its primary trade area. In suburban setting, the trade area within a 1.5- to 3- km radius and its residents, on average will shop once/twice a week. In rural area, the trade should cover 8 km radius. Meanwhile in a high-density neighborhood, the center should be located within half a mile or even just a few blocks. On average, it has 10-15 small retailers (bakery, bank, bike shop, dry cleaner, etc)
4. Community centers: Community centers are larger than neighborhood centers. It is typically 25000 - 35000 square meters and draws customers from within a 6 to 10 km radius trade area with a population of 50.000 or more. Meanwhile, International Council of Shopping Centers (ICSC) mentioned that typical community centers are 10000-40000 m² in GLA size and have 15-40 stores.

Community centers are anchored by major department store, home improvement stores, supermarkets, or restaurant clusters. The economics of many community centers often require low-cost construction and surface parking lots, except in affluent suburbs or high-density urban areas.

5. Regional center: This is the largest type of shopping center. These centers are always anchored by at least two full-sized fashion department stores and often include 20000 to 30000 square meters inline shops and restaurant. At a minimum, regional centers are 50000 square meters in size, but they can reach more than two hundred thousand square meters in area. They have 16- to 19-km radius trade area in regions with suburban densities. Meanwhile, International Council of Shopping Centers (ICSC) mentioned that the primary trade area of regional shopping centers are 8-24 km and they typically have 40-80 stores.
6. Lifestyle or town center: This type of center is created in an effort to offer upscale fashion and home furnishing without subsidized department stores. By definition, lifestyle centers only include retail and restaurant uses, while town centers incorporate office, residential, and civic use as well. It can be located between regional centers, or even nearly adjacent to these. The trade area is 8-12 km.
7. Outlet centers: Outlet centers are programmed to allow select manufacturers of apparel, electronics, gifts, house wares, and other products to sell directly to customers. The average size is 20000 square meters. Typically, outlet centers contain large unanchored retailers or department stores. This type of center is always developed on inexpensive real estate, and usually as open-air strip centers with surface parking.

Statens institutt for forbruksforskning/SIFO or National Institute for Consumer Research mentioned various types of centers available in Jæren, Rogaland:

- *Hovedsenter* (county/region center). It has an important regional function in serving goods and services for most people in the region.
- *Kommunesenter* (municipality center). It provides various shops, culture and public services.
- *Bydels-, kommunedelsenter* (district center). It offers shops and some services to cover neighborhood demands.

Statens Vegvesen or National Transport Plan added community center and local service in addition to the types of centers described by SIFO. A local center has a limit up to 800 m² of BRA and is developed in a residential area.

Rikspolitiks bestemmelse/RPB or the Nationwide Regulation explained that a shopping center is a place for trading one or more retail goods, whether it is open for all customers or limited membership customers. It also said that a grocery store could be categorized as a shopping center. City centers, neighborhood centers, and other local centers are important points for people to socialize besides shopping. The centers must be accessible from/to public transportation nodes so people would prefer to use public transport, thus reducing the need for private car users for shopping trips.

Below is a guide to in locating a shopping center based on its size.

1. Shopping center < 3000 m² BRA or Gross Leasable Area (GLA). This shopping center is situated in a relatively low density urban settlement. A grocery store or small local public services are desirable in this center. If the center is located in a low density and spread settlement area with poor public transport, it is necessary for the center to provide parking space as many visitors in this shopping center will use private cars.
2. Shopping center > 3000 m² BRA in a center of a city. Shopping centers in this context are situated in a dense urban settlement. The shopping center should have good accessibility for pedestrians, including cyclists. Public transport should be available close to towards this shopping center. The number of parking area should be determined in order to limit unnecessary use of private cars.
3. Shopping center > 3000 m² in BRA in a neighborhood center. Shopping centers in this context are situated in a less populated area than in the center of the city as mentioned above. The shopping center in the neighborhood should provide good accessibility for pedestrian, public transport and good connections to the city center by public transport.

Meanwhile, TØI describes type of shopping centers as follows:

- a. Shopping center categories based on location
 - Downtown center (*bykjernesenter / bysenter*)
 - Semi-external centers (located in the border of the city)
 - External centers (located outside the city).
- b. Shopping center categories based on sizes/surrounding area:
 - Local center / district center (local market oriented)
 - City center or town center
 - Regional center (has the ability to cover big region with many cities/towns)

3.1.2 Characteristics of shopping centers

Victor Gruen (1993) mentioned two types of shopping centers based on their response to the surrounding area and pedestrian flow;

- Introverted centers provide for show windows and entrances to the individual stores exclusively from the public pedestrian areas (malls, courts, arcades, etc.). In the case of the introverted centers, the shoppers are guided from arrival points through a limited number of short arcades into the main lobby area. The shoppers then experience all the amenities of the public areas and are given the chance to establish contact with all stores in the course of their shopping trip.

Impacts:

1. Saving capital and operating costs for the entrepreneur as well as for each of the individual tenants, because only one set of store fronts and entrance doors are necessary.

2. The possibility of an attractive treatment of the exterior of the center core which is freed from individual signs and advertising.
 3. The possibility of employing fully all those measures, which bring about a balanced shoppers' traffic stream within the center complex
- Extroverted centers provides for show windows and entrances, which are directed toward the parking facilities, and for additional ones, which are directed toward the public pedestrian area.

Impacts:

1. Shoppers' traffic is split. Some of the shoppers who enter from the parking area might never be exposed to the public pedestrian area and thus to the other stores.
2. The provision of two store fronts, two entrance doors, two sets of show windows is wasteful, not only as far as capital investment is concerned but also as far as utilization of the rentable area and the operation of each individual store is concerned.

3.2 Pattern of centers in a city

Shopping centers are often located in the center of a neighborhood. The neighborhood could be a city center, a community center or a district center. Victor Gruen (1973) developed a new center's pattern, shown in Figure 3-1, as a response to growing population. He emphasized the necessity of having new strategy, which will cater the need for new spaces. He then designed a new form of urban pattern, which will conserve land and all those nature-given substances.

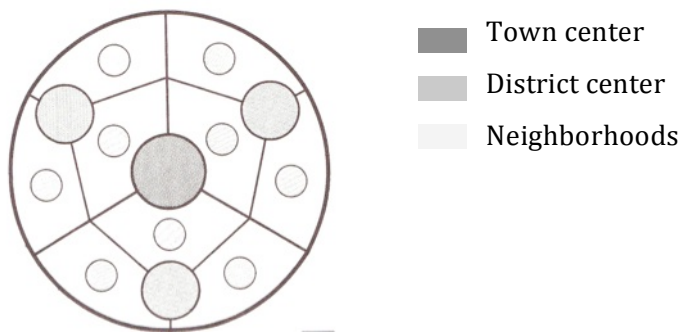


Figure 3-1 Abstract model of a typical urban subunit. By: Victor Gruen. 1973

The roles of each of the centers in the simplest term are:

- a. The neighborhood center serves immediate needs
- b. The community center serves weekly needs
- c. The town center serves standard requirement
- d. The metropolitan center serves exceptional requirements

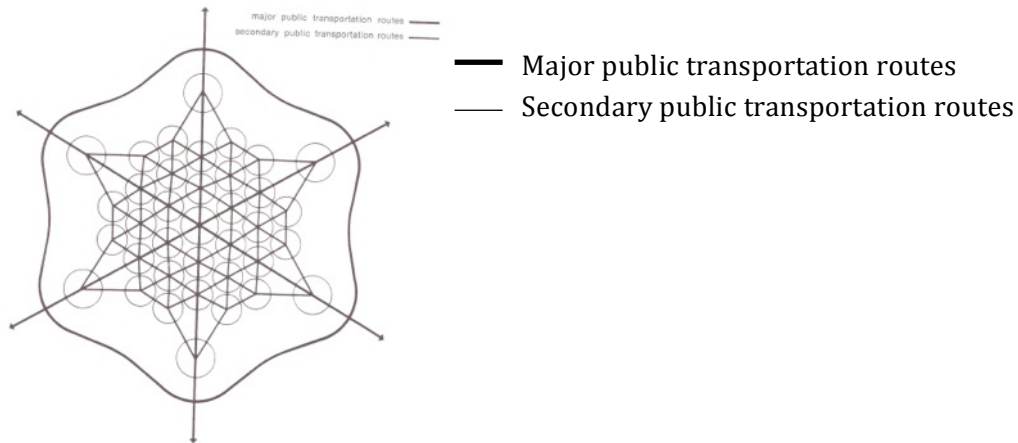


Figure 3-2 Model of a transportation node. Source: Victor Gruen. 1973

He also established a transportation model as shown in Figure 3-2. It illustrates how public transportation coming from the outside is distributed along the boundaries of the urban area, and how primary urban transportation connects all town centers. Secondary public transportation would consist of accessory transportation for people and goods.

3.2.1 Challenges for old city centers

Old town city centers contain heritage buildings and a valuable *genius loci*. The identity of the city often projected from its image of downtown (Robertson, 1999). Therefore, it represents the heart and soul in most cities. City centers have been developed into the domain of retails, business, leisure and culture. However, the growing population and the sprawling development are some of the major sources that contribute to the decline of a city center. This centrality of functions offered by the city center had become less preferable due to the new developments in other areas that compete with the city center. Kent Robertson (1995) mentioned some strategies in order to reestablish the distinctiveness of downtown, such as historic preservation, main street approach, pedestrian improvement, and waterfront development. He also described how a successful downtown revitalization can be achieved by:

- Maintain high density levels
- Emphasize historic preservation
- Maintain/develop true civic public places
- Do not “suburbanize” the downtown
- Develop and enforce strict design controls
- Do not underestimate the importance of street level activity
- Plan for a multifunctional downtown.

Those efforts correspond with other “downtown activist” such as Jan Gehl and Jane Jacobs. The main idea is to maintain the vitality and livability of the downtown so that people in the city can utilize it appropriately.

TØI (2015) explained that the effect from the development of regional shopping centers increases competition to a city center. Consequently, a city center with a regional shopping center nearby will significantly lose its trade. In addition, the

combination of a sprawling development of commercial areas, residential areas and working places contribute to the increased use of private cars.

Visitors have multiple purposes when they visit a shopping center and apparently shopping is not the only purpose. Therefore, a city center must offer several types of attractions, lively streets, or cultural activities in addition to shopping places in order to attract visitors. Stavanger municipality also believes that historic values in the city center will create an attractive center. Placing some shopping centers appropriately in the city center will strengthen the city center in terms of the economy viability.

3.3 Shopping activities and sustainable mobility

3.3.1 What do people buy in shopping centers?

TØI (2015) explained that it is important to know what types of retails are sold in the market. It appears that grocery is the most sold retail in the market. Normal grocery shopping often takes place in the shopping center as opposed to supermarkets or local grocery stores. This is an important factor to consider prior to developing a shopping center in order to avoid unexpected shopping trip patterns and undesirable competition between other commercial buildings.

TØI (1997) also found that 40-50% of customers at Ski and Vinterbro shopping centers in Akershus, said that grocery shopping is the most important reason for the visit. Larger supermarkets in the malls have a wider selection of goods and more special offers. The majority of respondents also undertook several other tasks in the shopping centers. It is convenient to run several errands in one location.

Another study was carried out by Spare-Bank 1 in Rogaland. Table 1 and 2 show that almost half of visitors do their grocery shopping in Rogaland while in Stavanger city center, only one third of visitors do the grocery shopping there.

Table 1 Turnover of various categories of goods in Rogaland county (1000kr). Source: Spare-Bank1. 2015.

Rogaland	2015	Proportion 2015
Total retail	35562000	
Grocery	15524000	48%
Clothing and shoes	3739000	12%
Building materials	3092000	10%
Others	6759000	21%
Furniture and electrical	3722000	12%
Sports and leisure equipment	1549000	5%

Table 3 shows that grocery retail still has the highest turnover in Stavanger city center but the difference in proportion between groceries, clothing and shoes, and others goods are not significant. Meanwhile, building materials and furniture/electrical goods have the lowest turnover. This happens because those stores are not located in the city center. Stores that sells large items and require a lot of space should be located outside of the city center. Referring to table 1, 2 and 3, it could be said that retails' turnover shows the amount of particular retails available in an area.

Table 2 Turnover of shopping goods in Stavanger region (Stavanger, Sola, Sandnes, Randaberg, Rennesøy) (1000kr). Source: Spare-Bank1. 2015.

Stavanger region	2015	Proportion 2015
Total retail	20295000	
Grocery	8136000	48%
Clothing and shoes	2334000	14%
Building materials	1362000	8%
Others	3696000	22%
Furniture and electrical	2528000	15%
Sports and leisure equipment	999000	6%

Table 3 Turnover of shopping goods in Stavanger city center (1000kr). Source: Spare-Bank1. 2015.

Stavanger city center	2015	Proportion 2015
Total retail	2611700	
Grocery	882200	34%
Clothing and shoes	644200	25%
Building materials	13700	1%
Others	794400	31%
Furniture and electrical	115100	4%
Sports and leisure equipment	117000	5%

3.3.2 Sustainable mobility and shopping

Travel distance determines what types of retail that people will buy. Chart 1 shows that most people who shop for groceries live in a short distance from the stores. Radius 1 km is the optimum distance for shopping trips, especially grocery shopping. After that, the numbers of trips gradually decrease as the distance to the stores increase.

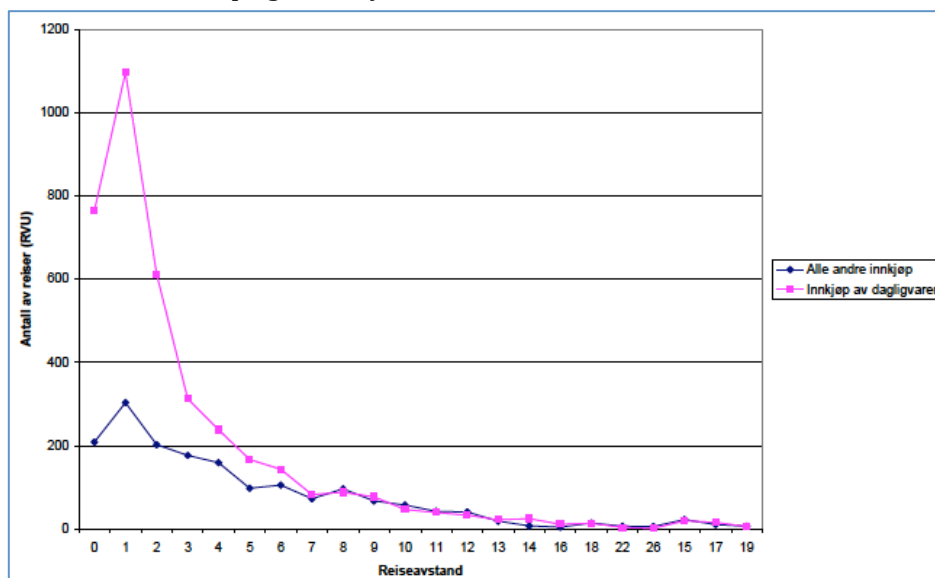


Chart 1 Travel distance (km) and shopping trips in Stavanger region. Source: RVU 2005/Asplan Viak 2007.

TØI (2010) explained that shopping centers must provide good accessibility for pedestrians and cyclists. The acceptable walking and cycling distance varies from place to place. Buskerud county (2003) and TØI (2006) described the acceptable distance as in Table 4.

Table 4 Acceptable distances for pedestrian/cyclist. (Buskerud fylkeskommune 2003)

Distance in km	Walk	Bicycle
Regional center	1,0-1,5	2,0-3,0
District center	0,8-1,0	1,5-2,0
Neighborhood center	0,5-0,8	1,0-1,5

Shopping centers with good accessibility for pedestrians, bicycles, and public transport are expected to reduce the use of private cars. In addition, to prevent unnecessary private car use by visitors, the shopping centers should limit the parking lot capacity. Staten vegvesen also wish to reduce car traffic by limiting the size of the parking area in shopping centers' parking areas and they expect visitors to use sustainable means of transportation.

TØI (2010) also recommended the ideal capacity for a parking lot in a shopping center in order to achieve environmentally friendly mobility:

- A shopping center that has a good access for public transport should have low capacity for private car parking; 1 parking space per 200 m² BRA or less.
- A shopping center that is located in a low density area with insufficient access for public transport in which its condition is not conducive to significantly increase the use of environmentally friendly transport means that it should provide ample parking; 1 parking space per 50 m² BRA.
- A shopping center that requires a big space (especially for logistic activities / big transport) should have a good parking area; 1 parking space per 100 m² BRA.

The World Business Council for Sustainable Development defines sustainable mobility as: 'the ability to meet society's need to move freely, gain access, communicate, trade, and establish relationships without sacrificing other essential human ecological values, today or in the future' (WRI, 2004).

In the UK, the land use planning policies proposed in PPG13 (Planning Policy Guide 13) would help reduce the need to travel in four ways (Department of Energy (DoE)/Department of Transport (DoT), 1994; Banister, 1994 as cited in Guy, 2007)

1. New development should be located where it is readily accessible by a choice of travel modes
2. New developments which have the potential to attract multi-purpose trips should be clustered together
3. New housing developments should include local facilities, in order to encourage walking and cycling trips
4. Traffic demand should be managed by planning authorities through control of car parking

The first two of these policies emphasized that town and district centers are the ideal locations for retail development. These center sare normally the focus of established public transport routes and hence are accessible to people who do not have access to using a car. Large stores (mainly grocery stores), which would not easily fit

into traditional center environments, should be located at the edge of the center, accessible by foot from the main retail area (DoE/DoT, 1995: 74-5 as cited in Guy, 2007)

Along with many other writers, Banister (1997) also suggested that new residential development should be at densities high enough to create viability for local services and facilities for walking and cycling within neighborhoods should be improved.

The final assumptions from Planning Policy Guidance 13 in UK, which also underlie the planning policy discussion:

1. Out-of-center retailing generates proportionally more car travel than similar retail provision in town centers
2. Therefore, building more out-of-centers will reduce dependence on car trips.
3. Building supermarkets in or close to town centers will encourage linked trips, therefore reducing total car travel.
4. High-density residential and mixed-use development will encourage local shopping and reduce total car travel.
5. Car parking should be restricted in order to discourage shopping trips by car
6. Public transport/bicycle/walking modes are seen by shoppers as appropriate for shopping trips: (essential for non-car ownership and adequate for car owners)

Clifford Guy (2007) investigated some surveys regarding shopping activity and sustainable mobility in Britain. He found that stores located close to town centers would do little to reduce overall car travel. Surveys carried out in Safeway stores showed that their town center supermarkets tend to attract at least 80% car trips (Hass-Klau et al. 1998: table 26 as cited in Guy 2007:179). In the meantime, research by Sainsbury's (1993:6) showed that 97% of car-owning household 'used the car regularly for the main food and grocery shopping'.

Guy (2007) assumed that it is generally true that out-of-center retailing generates proportionally more car trips than similar retail provision in city centers, but it is not always true that building more out-of-center stores will increase total car travel. The number of travels is determined by travel chain or linked trips. The study of Monheim (as cited in Hillnhütter, 2016) demonstrated the importance of travel chains in reducing the total travel demand in cities. The author showed how accessing more destinations along one journey can decrease trips between homes and travel destinations, for example, travelling from work directly to a shopping center, and then to sport facility before turning home as shown in Figure 3-3.

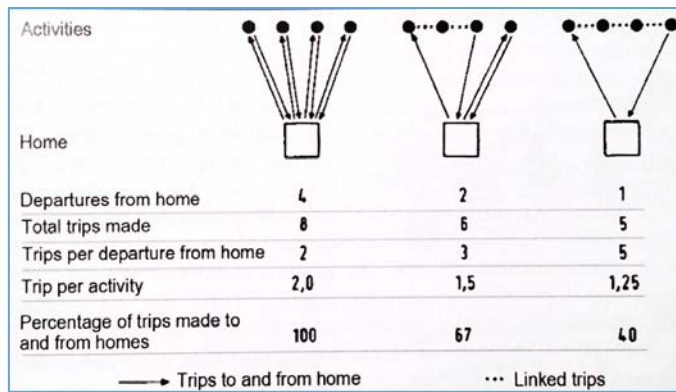


Figure 3-3 The influence of travel chains on the total travel demand in cities, translated from R.Monheim (1985a, p.268) (as cited in Hillnhutter, 2016, p.15)

One effort in achieving sustainable transport in general is by developing a TOD (Transit Orient Development) in a city. TOD's neighborhood with an advanced public transport system would have a 'commercial core' containing shops, restaurants, local offices, entertainment and community facilities with possibly high-density housing situated above them, all within the radius of 100 meter (Tony Hall, 2015). Hall added that substantial office employment and high-density housing should be located adjacent to the commercial core. The commercial core contains a minimum of a convenience store and local offices. This local center would be surrounded by primarily residential and educational uses at comparatively lower density within walking distance of 800 meters.

3.4 Shopping centers policies and strategies in developing shopping centers

Rikspolitisk bestemmelse/RPB or the Nationwide Regulation decision published a regulation for shopping centers in 2008. The main purpose of the policy provision is to standardize the development of the shopping centers across the region. The policy is used as a tool to strengthen existing urban centers, promote efficient land use, and offer environmentally friendly transport choices. The long term goal is to achieve a sustainable and resilient urban development.

Shopping centers can only be established or expanded in accordance with the approved county plan or municipality plan. For areas not covered by such plan, it is not allowed to establish or expand shopping centers with a total floor space of more than 3000m². The authority in the county can give consent to waive the provision, if after an assessment, the expansion of a shopping center is considered to be compatible with the objective of the regulation. This policy is valid for ten years from the year it was announced.

TØI (2010) stated that new development of shopping centers in Jæren should be located within the regulated area in the cities that is in the center area. The exception apply for shopping centers that require big space e.g. for logistics / storage. Those shopping centers could be located outside of a center area in a city. It is not allowed to develop new shopping centers outside the regulated area that has been determined in the regional plan or municipality plan. Corner/local stores in residential areas that

provide daily needs can be built up to 800 m² BRA. The distance between these stores should be more than 1 km.

Based on a survey conducted by TØI (2010) shopping centers outside of the cities have a proportion of cars at over 95%, while shopping centers in the central location have a proportion right down to 20%. At the same time, SIFO (2000) reported that around 95% of visitors use private cars to go to shopping centers outside of the city, while 44-60% visitors use private cars to go to inner city shopping centers. RPB (2008) also said that larger shopping centers must have accessibility to public transportation nodes so that the use of private cars will decrease.

3.4.1 Stavanger municipality

In Stavanger, there is a municipality regulation that specifically mentioned about location and size allowance for a district shopping center as shown in more detail in Appendix 5. Retail area should be concentrated in the center area of the district. *Plan- og bygningsloven* (PBL) § 11.10 explained that BRA is a total area for sales, storage, eating area / canteen and also office area. Therefore, BRA is equal to Gross Leasable Area (GLA). Appendix 5 shows that Stavanger sentrum area does not have a certain size of limitation in developing its retail centers. Meanwhile other district centers has various limitation from 10.000 m² to 40.000 m².

Shopping centers that require a big space could also be located in regulated business areas in Forus, outside the area influenced of public transport.

In the document "*Framtidens byer*", TØI mentioned main objectives in developing commercial areas for future cities in Norway:

- Strengthen, revitalize, develop, and protect city centers. The management and development of commercial areas are formulated differently in every municipality. It is also important to strengthen existing local centers. Accessibility for citizens in commercial areas should also be maintained.
- Reduce private car traffic
- Create job opportunities
- Set the goals. They might be different from in every municipality. One of the smaller municipalities has stated that commercial development should be concentrated in downtown and local centers. Local centers will provide daily needs for the citizens in the surrounding area. The centers must be clearly defined, easy to distinguish, have strong centrality, and be accessible for all. Other big municipalities like Oslo emphasizes that the centers should have reasonable distance to the residential areas. They must have good pedestrian infrastructure and a good public transport system

Stavanger municipality plan document 2006-2021 mentioned some regulations regarding center development in the Stavanger area:

- New shopping centers can be developed in the assigned area for commercial business with specific size allowance.
- A shopping center that needs big spaces (for logistics) can only be developed in certain areas.

- A corner store / local store that selling products that cover daily needs could be build up to 1000 m2 BRA. The distance between local stores and a center must be more than 500 m from the periphery of the center.
- Plan for district / local centers should be approved at municipal level.
- Development of the city center is a priority.
- The regulation is to prevent undesirable competition between an existing city center / district centers and new shopping centers.

Stavanger sentrum commercial area must provide parking space for both cars and bicycles. There should be minimum 0,5 and maximum 0,9 car parking space in every 100 m2 BRA. At least 3 bicycle parking spaces should be available per 100 m2 BRA. In other commercial areas that have high density and are close to public transportation, car parking space should be available at minimum number of 0,9 and maximum 1,2, and have 2 bicycle parking spaces in every 100 m2 BRA.

3.4.2 Forus-Lura, Sandnes

Lura is a district in Sandnes. It is also situated within Forus business district. The district has a center that consists of commercial functions. The size allowance of commercial functions, including shopping centers, is not clearly explained in the municipality's development plan. The municipality only mentioned that the size of shopping centers in Lura is adjustable, depending on trade analysis and impacts to the surrounding area. However, the development or expansion of the shopping centers shouldn't outperform the existing city center.

The central area should consist of many functions such as public or private services, shopping centers, housing, industries, culture, squares, playground areas, and green structure. The centers should provide good accessibilities for pedestrian and public transport. Parking lots are preferably developed inside public facilities (indoor parking).

Outside of the center area, small shopping centers for grocery retail can be established up to 1000m2 BRA. Corner stores must be located more than 500m from the center's periphery. Each corner store should be at least 500m away from each other.

Parking space is one of the mandatory facilities in Forus. Based on the Regional Plan of Stavanger, there should be 0,75-1 parking spaces per 100 m2 BRA in the Forus area. Meanwhile, there is a regulation about parking space in Forus based on type of building purpose and percentage of private car use:

- For buildings for industry or storage with more than 60% car use the parking space should not exceed 0,6 parking spots per 100m2 BRA.
- For commercial buildings, shopping centers, and other type of stores with more than 60% car use the parking space not exceed 2,9 parking spots per 100 m2 BRA.
- For business/office buildings with more than 60% car use the parking space should not exceed 2,2 parking spots per 100m2 BRA.

Figure 3-4 shows that Forus area defined as a regional destination point, open for business and commercial activity within the *bybane* or the busway impact area. Forus-Lura area is prepared for workplace gravity.

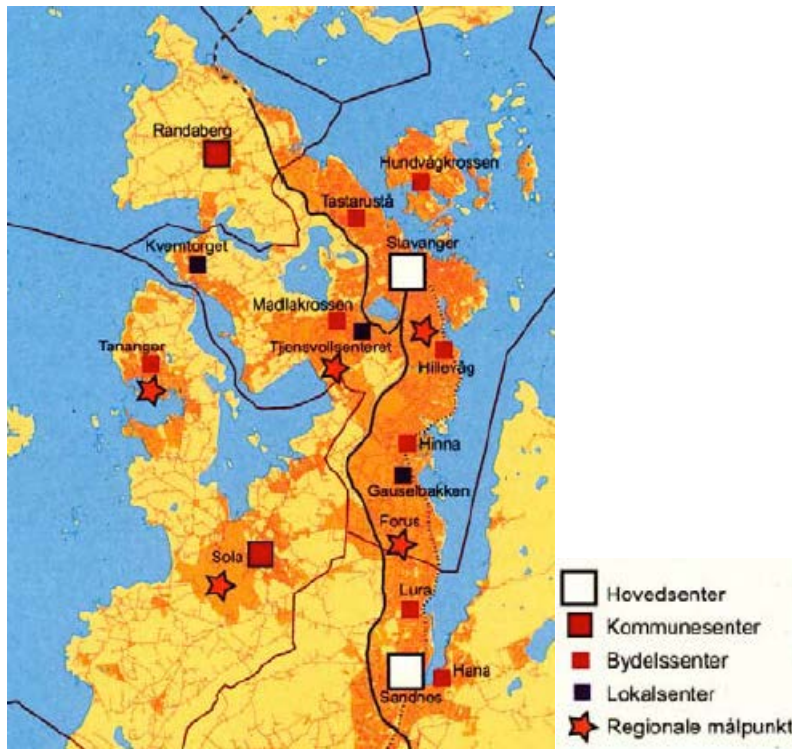


Figure 3-4 Structure of centers for long term development of Stavanger region. Source TØI. 2010

Sandnes municipality defined three main purposes regarding regulation in both city center and district centers;

- Strengthening the quality of centers for local community by increasing commercial activities, social, and esthetic aspects.
- Create an environmental friendly transport system
- Develop the area to accommodate the optimum number of population and to achieve attractiveness.

4 PREVIOUS STUDIES – SHOPPING CENTERS IN NORWAY

This chapter presents some research carried out by TØI, Aplan Viak, Spare Bank 1, and SINTEF in different periods and contexts. Generally, the research discussed shopping centers' development in the Stavanger region and their relation to the population growth, types of retail and turnover. In addition, the research also examined shopping trips' situation in the Stavanger region such as modal share and average travel distance.

4.1 Shopping centers development

Shopping centers in the Stavanger region has developed rapidly since the 1980's. The competition between shopping centers has increased in terms of attracting visitors and gaining high revenues. As a result, the centers have tried to expand the areas, added more stores, redesigned the buildings, or expanded parking capacity. Shopping centers select the tenants and preferred to choose international chain stores as they offer a wide range of products for a reasonable price. However, this condition may affect the livability of local shops and other commercial buildings in the center area. Therefore, the task is to strengthen city centers or district centers in the region while these competitions continue to happen.

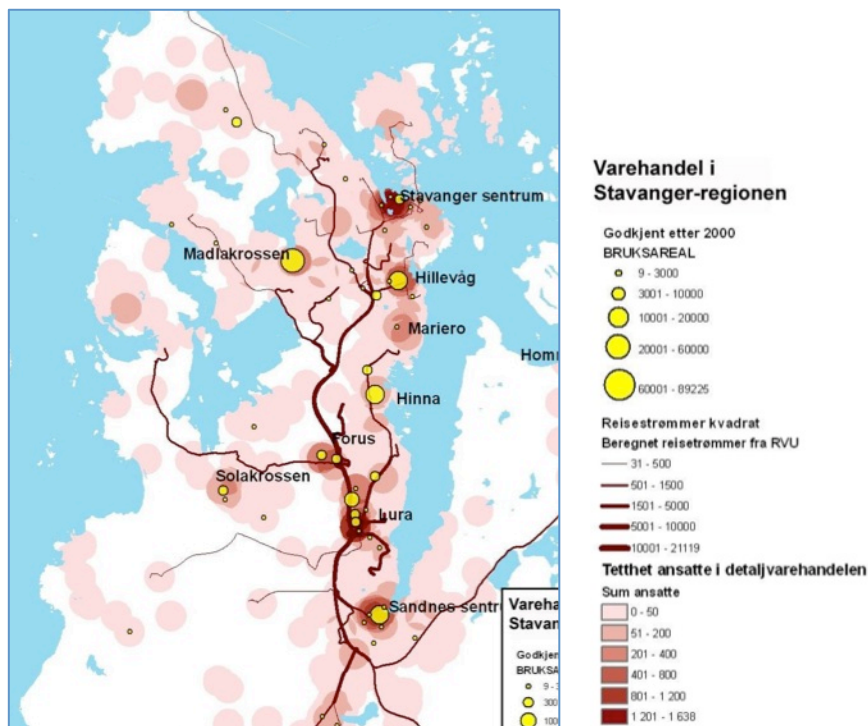


Figure 4-1 Shopping centers in Stavanger region 2000-2006. Source: Asplan Viak. 2007

Based on Figure 4-1 by Asplan Viak (2007), Stavanger sentrum, Forus, and Lura have high concentration of employees in retail industry. Meanwhile, Madlakrossen, Hillevåg, Hinna, and Sandnes sentrum have many shopping centers. The thick line on the

map represents number of trips. Apparently, traffic along Hillevåg-Forus is the busiest in the region. It occurs either because of shopping trips, commuting trips, or the combination of them.

TØI (2010) mentioned that from 2000-2006, business and commercial areas in the Stavanger region had developed to 220.000m². In their survey the Stavanger region consists of Stavanger, Randaberg, Sola, Sandnes, Klepp, Time, Hå, Strand, Gjesdal, Rennesøy. Apparently, 73% of the development happened in the regional point of the region as shown in Figure 3-4.

Kvarud (2008) described a forecast for the district's retail turnover 2006-2020. He found that a high population growth gave impact to the growth and turnover of the shopping centers. In the same time, SSB (2010) said that the population growth from 2005-2020 is 30.9%. They predicted that there would be 350.000 more people in the Stavanger region by 2020 and obviously, the growth will drive the commercial development and its turnover. The highest retail turnover will be generated from shopping centers, followed by grocery stores. Regarding district turnover, Sandnes is expected to have the highest turnover in the Stavanger region (TØI, 2010).

Besides population, the BRA of shopping centers in Stavanger municipality will also increase. Total BRA of the shopping centers will reach 205.000 m² in 2020. In the same time period, Sandnes will grow 38% in BRA and will reach 213.000 m² in 2020. Each type of commercial area will have different proportion where shopping centers will increase 50% in BRA and grocery stores 28%. Other types of commercial buildings that selling furniture, building materials, and car workshops are increasing respectively 26%, 31%, and 23% in size.

4.2 Shopping trips

Spare-Bank 1 (2015) described the turnover in between some districts in Rogaland as shown in Table 3, 5, and 6. Both Stavanger and Sandnes city center have a lower total retail turnover than Lura. Lura and the two city centers happen to have a different proportion of majority retail sales. Both city centers have the highest turnover in groceries, while Lura's furniture and electrical retail are the highest.

Table 5 Turnover of shopping goods in Lura district, Sandnes (1000kr).

Lura	2015	Proportion 2015
Total retail	3767000	
Grocery	424000	16%
Clothing and shoes	573000	22%
Building materials	249000	10%
Others	696000	27%
Furniture and electrical	1538000	60%
Sports and leisure equipment	222000	9%

Table 6 Turnover of shopping goods in Sandnes city center (1000kr).

Sandnes city center	2015	Proportion 2015
Total retail	2197000	
Grocery	727000	28%
Clothing and shoes	390000	15%
Building materials	207000	8%
Others	579000	23%
Furniture and electrical	87000	3%
Sports and leisure equipment	119000	5%

Asplan Viak (2007) mentioned that shopping trips in the Stavanger region increased 20% from year 2001 to 2005. The increased shopping trips were due to the population growth during that period. Apparently, half of the shopping trips were shorter than 3 km and more than 70% were trips by private cars and only 5 % of the shopping trips were by public transport. The report also said that the visitors in Kvadrat shopping center are willing to travel farther than any other district shopping center in the region.

Independent research organization SINTEF (2012) carried out a travel behavior survey in shopping centers across the Stavanger region as shown in Chart 2. They found that 70% of the respondents used private cars, 15% walked, 6% used a bicycle, and 6% used public transport. At the same time, Berg and Thesen (2006) said that 70% of shopping trips in the Stavanger region were by private cars, 12% by walking, 9% as car passengers, 4% by bicycle, 4% by public transport, and 1% were other modes of travelling. These research showed that the modal share hadn't changed much from 2006 to 2012 and apparently, shopping by walking had a higher percentage than shopping by public transport.

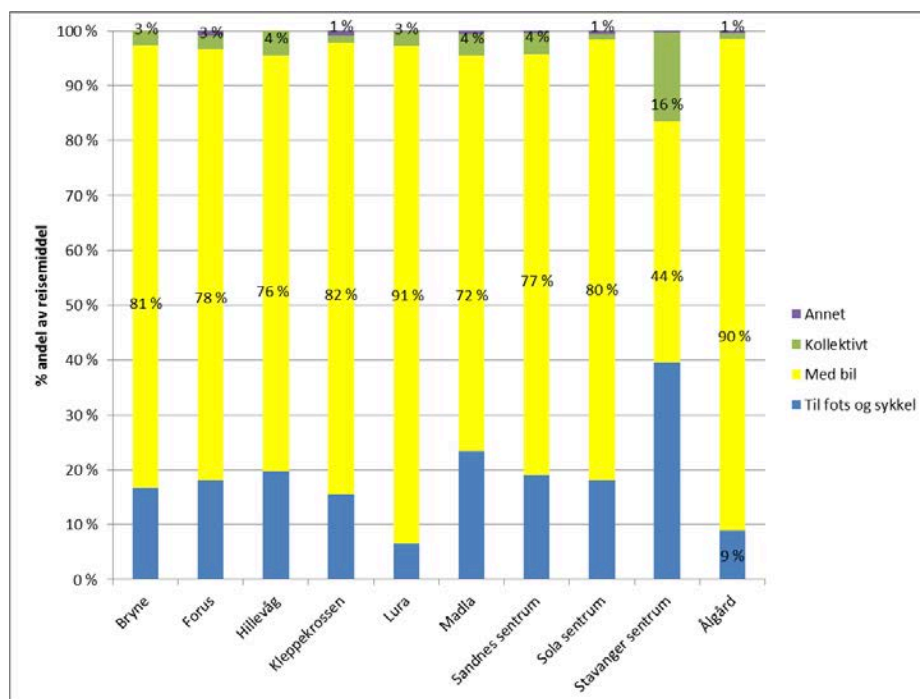


Chart 2 Modal shares by customers to different shopping areas in Stavanger Region. Source: SINTEF 2014.

SINTEF (2014) found that Lura district in Sandnes has 91% or the highest shopping trips by private cars. Meanwhile some districts in Stavanger such as Forus, Hillevåg, and Madla have a proportion of private cars trips of over 70% whereas Stavanger sentrum has the least shopping trips by private cars.

Meanwhile, the majority of the trips are to shop within people's own municipality, and nearly 80% of them use cars. Non-motorized vehicles are used for 17% of these trips, while public transport is used for only 4% of the trips to shopping or service-activities. Chart 3 shows that shopping trips occur in the people's own neighborhood. 70% of people did the shopping in their own municipality and 13% of them travel outside their own municipality.

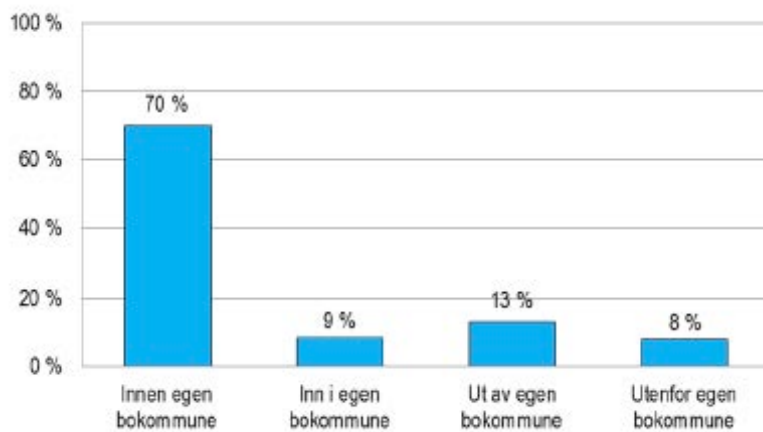


Chart 3 Geographical distribution of travel behavior in shopping centers. Source: SINTEF 2012

In the mean time, Asplan Viak's (2013) said that the sizes of the municipalities in the Stavanger region are small and therefore commercial activities are so interwoven throughout the districts. Kvadrat and Ikea contribute to a strong commercial area in Lura in Sandnes. Sola does not have any shopping centers so its retail turnover is lower than in Stavanger and Sandnes. Madla and Hillevåg have high turnovers because those districts have big shopping centers such as Madla AMFI and Kilden that attract many visitors and generate huge amount of transactions.

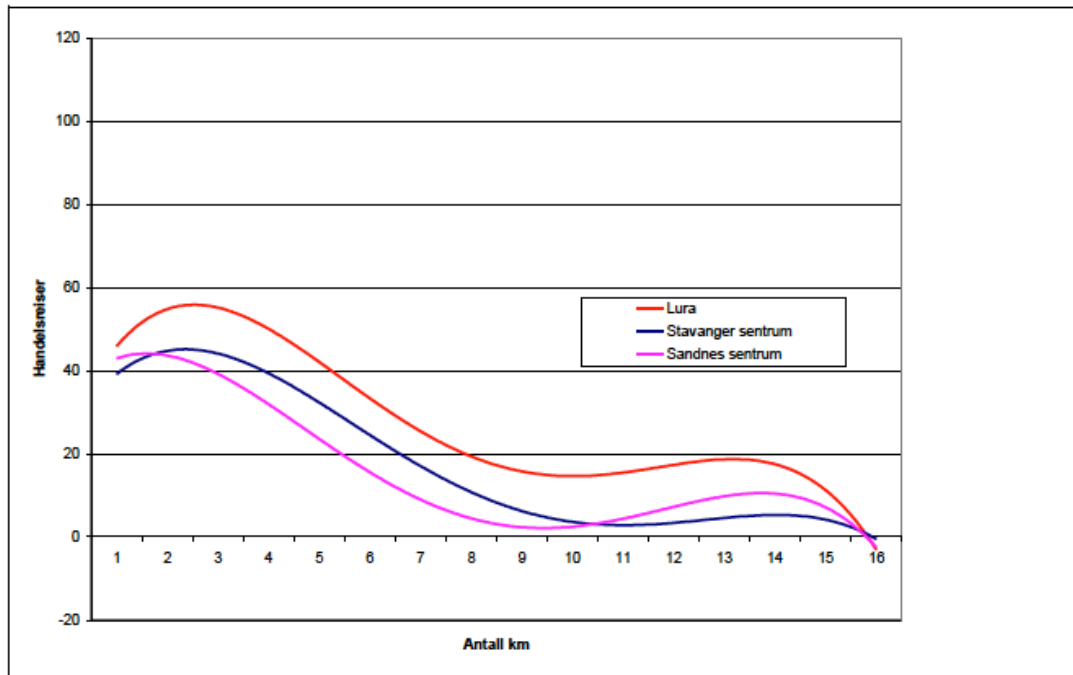


Chart 4 Travel pattern for shopping trips between three different shopping areas. Source: RVU2005/Asplan Viak 2007

Chart 4 shows that Kvadrat shopping center in Lura has more shopping trips than Stavanger and Sandnes sentrum. Shopping trips also represent the number of visitors who travel to the shopping centers. The patterns of shopping trips as shown in the chart between Lura, Stavanger sentrum, and Sandnes sentrum are the same. Shopping trips gradually decrease from 3 km until 9 km, although there is a slight increase for 13 km and 14 km. This means that most of the visitors live within a 3 km radius from the shopping centers they visited.

Asplan Viak's (2007) research study found that travel distance determines types of shopping as shown in Table 7. People prefer to do the grocery shopping in less than 1.6 km from where they live. However, grocery shopping up to 5 km is still acceptable. On the other hand, 5-10 km is the travel distance where most people will do other types of shopping such as clothes/shoes, furniture, electronics, building materials, etc.

Table 7 Shopping trips in Jæren. Source Asplan Viak 2007

Travel distance (km)	Grocery shopping	Other shopping
< 1,6	44%	27%
1,6-5	39%	37%
5,1-10	12%	25%
10,1-20	5%	11%
Total	100%	100%

Lunden (1994) mentioned that walking & cycling are predominant transportation modes for shopping trips less than 1 km. Meanwhile, private cars are a preferable transport mode when people need to shop at more than 1 km distance.

TØI (1992) also carried out a survey about shopping centers in Oslo in the late 1990s. They investigated Ski and Vinterbro shopping centers that are located outside Oslo. Both shopping centers have easy access to the highway and they are characterized as typical car-based out-of-town shopping centers. The research found that Ski shopping center

has larger visitor numbers than Vinterbro because the location is close to residential areas and workplaces.

Many studies have attempted to uncover whether or not establishing new shopping centers really lead to the increase of private cars' use. The conclusions are not always clear and sometimes contradictory. Visitor surveys in shopping centers showed that people travel to shop in different stores inside at the same time, but less frequently, i.e. once a week during the weekend.

New offerings in shopping centers may increase the distance between shopping centers and the existing city center, where independent local shops are often located. People fear that this will happen overtime and contribute to a dead city center as well as increasing car travel.

Shopping centers with long opening hours and parking spaces attract more visitors. In addition, shopping centers that offer amenities such as a playground, toilets, and a nursery area will make the visitors stay longer.

When shopping centers attract so many visitors from areas farther away, the total travel distances and traffic volume will increase. Meanwhile, when a shopping center is located in the center of the district and concentrated with other building's functions, the travel distance will be less although the traffic volume is still unpredictable.

5 SHOPPING CENTERS IN THE STAVANGER REGION

This chapter presents the big picture about shopping centers development in the Stavanger region. The aim from is to show, in general, the relation between the shopping centers, the district centers, and the districts. The study includes both physical and non-physical aspects of the shopping centers such as location, building characteristics, infrastructures, turnover, mobility pattern, and population in the surrounding area. The discussion attempts to address the research questions about the relation between shopping centers and their neighborhoods and the impacts to sustainability. The result will show which shopping centers have the most significant influence on the city and the selected shopping centers will be investigated further in the following chapter.

There are several types of shopping centers in the Stavanger region. Many of them are located in the district centers. The regulation said that commercial buildings, particularly shopping centers, should be concentrated in the center area and should be mixed with other types of buildings such as housing, business and offices. This strategy is to achieve denser urban areas and will help to prevent sprawling development and decrease private cars dependency. Shopping centers that require big space such as furniture and electronic stores or building material suppliers could be located outside of the center area therefore the mobility in delivering goods will not interfere the neighborhood's traffic. Refer to the literature study, Stavanger region's pattern has developed in the same way as Victor Gruen's concept about decentralizing district centers as a response to the population growth. Stavanger region is composed by municipalities as units and districts as subunits. Each of them has a center where activities such as commercials, cultural institutions, and business are concentrated. Basically, both municipality centers and district centers play the same roles. They

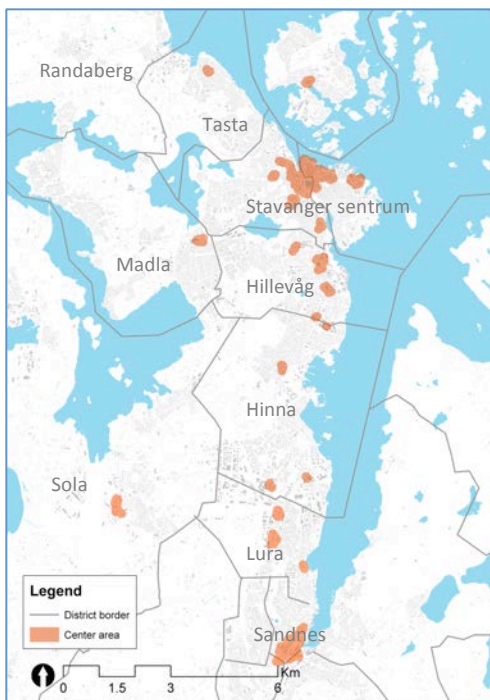


Figure 5-1 Distribution of center areas in Stavanger region. Sources: Norge digitalt and ArcMap software.

should provide mixed-use facilities for the inhabitants. Things that distinguish between those centers are the scope area and the size.

Concentrating center areas is a strategy to draw population growth into one area instead of sprawling. A dense center helps to decrease transportation and energy needs and promotes people to use environmentally friendly transportation. It also increases the centers attractiveness therefore enhance the quality of a neighborhood. In terms of accessibility, this research found that access to public transport and availability of parking area have been materialized by most of the shopping centers in Stavanger region, regardless to how effective it is used by people in the city and how advance the public

transportation system is. The accessibility for pedestrians is one of the important factors to

establish an integration with the neighborhood. However, there are some elements that could hinder the integration such as parking structures and transportation infrastructures that are often considered as physical barriers for mobility.

5.1 Type of shopping centers in the Stavanger region

Based on the description about shopping centers by SIFO (2010) and TØI (2010), shopping centers in Stavanger are categorized based on their location and size; regional shopping center, city center, district shopping center, and neighborhood shopping center. Stavanger sentrum is the city center in Stavanger. The area consists of individual stores in the pedestrian street area, shopping centers, public institutions, and business/office buildings. The pedestrian street is a safe area for pedestrian as it excludes vehicular transports around the area. Stavanger sentrum has good accessibility for public transport and the bus terminal is located less than 400 m from the pedestrian street. The pedestrian street also offers social and cultural functions such as library, cinema, an outdoor lakeside area, and an outdoor venue for activities whose functions are rarely found in a typical shopping center. The life of the pedestrian street's neighborhood attracts many people to visit Stavanger sentrum therefore the city center in Stavanger is very vibrant. Other than the pedestrian street, there are also some indoor shopping centers in Stavanger sentrum. The shopping centers sometimes have the same stores as in the pedestrian street. The advantage of having the outdoor pedestrian street and the indoor shopping centers in the same neighborhood is that people can alternately visit the shopping places they want to, depending on their conditions, i.e. women with small children may need shelter or a nursery room inside a shopping center or people prefers to be inside a shopping center during harsh weather. In addition, offering people with many building functions such as station, bus terminal, library, old church, etc will strengthen the idea of Stavanger sentrum as a main hub for the city. Regarding functionality, Stavanger sentrum can also behave as a region center. SIFO (2010) explained that a region center should be able to serve goods and services for most people in the region. At the same time, Stavanger sentrum has a wide range of goods and services. However, it is not practical to shop large amount of goods and switch between stores that are spread out across the city center.

Robert J. Gibbs (2012) explained that a regional shopping center is the largest commercial building among other types of shopping centers. The location is the outside of the city border and the area should be at minimum 50.000 m² in BRA size. It also needs to be anchored by at least two large department stores and consist of more than 40 stores. The primary trades of regional shopping centers varies between 8-24 km and are expected to cover 150.000 people's need, depending on the density around it. Kvadrat shopping center in Sandnes municipality is the regional shopping center in Rogaland county. The location is adjacent to the Stavanger city border. People from other municipalities (i.e from Stavanger, Sola, Sandnes, Klepp, Time) can reach Kvadrat shopping center easily by a car because the highway is situated next to it. It also provides vast and free parking. Food courts, cafes, and restaurants are available in the shopping center so people could spend more time there. Many researchers agree that the more time spent in a shopping center, the more turnover value and revenues a shopping center will get. These kinds of facilities also provide social spaces for people, a

nice indoor area for children to play around in, or simply a convenient space for people during a harsh weather.

Based on the criteria, most of the district shopping centers in Stavanger are in the category of community centers. A community center has BRA between 10000-40000 m² with primary trade area 6-10 km. To be economically sustainable, a community center should be able to cover 50000 population of its trade area. Shopping centers in Stavanger are located in every *bydel* or district in Stavanger. Each of them has a district center, which consists of commercial buildings that sell goods and offer services for the entire inhabitants in the neighborhood. Some shopping centers in this category are Tastasenter, Madla Amfi, Arkaden, Kilden, Stadionparken, Tvedtsenteret, Amfi Vågen, Bystasjon. Based on the regulation, as shown in Appendix 5, a district shopping center in Stavanger has a size limit between 10.000 m² to 40.000 m². A shopping center in a district center should have good accessibility for public transport and pedestrians/bicycles. It is a strict regulation because Stavanger wants to achieve the goals for sustainable transport, although until today there are many people who still prefer to use private cars rather than public transports to visit the centers. Nevertheless, most of the shopping centers in this category consist of at least 25 stores and they can cover all Stavanger municipality's inhabitants in the primary trade area of 6-8 km.

Neighborhood centers in Stavanger are Straen Senteret and Magasinblaa. A neighborhood center is a shopping center that has GLA size 5000-10000 m². It should cover 6000-8000 households within the primary trade area of 1,5-3 km.

Special shopping centers in Stavanger such as big supermarkets (Coop Obs,), building material suppliers (ByggMax, Maxbo, Monter, Coop bygg, etc), big furniture stores (IKEA, Jysk, Skeidar, etc), electronics and cars equipments (Lefdal, Elkjøp, Biltema, etc) are located in a low density area or at the border of the city next to a highway or a major road. The location is selected due to the logistic mobility that requires big and easy. A big shopping center's precinct should be big enough for picking up and delivering goods with a special type of transportation.

Meanwhile, convenience stores and corner stores such as Rema 1000, Kiwi, Coop prix, and Joker offer an array of goods for daily needs and groceries for inhabitants in the surrounding area. These types of stores allow shoppers to make a quick purchase on the way to or from home.

Recently, an outlet center named Norwegian Outlet was established in Ålgard municipality. It is located approximately 25 kilometer south of Stavanger city. It sells various apparels directly from manufacturers to customers. So far, there is not any regulation about outlet centers in the region but from the size of the building itself, Norwegian Outlet is almost the same as a regular district center, but the location is even more rural than that of the regional shopping center.

5.1.1 Definition of a shopping centers for the research

Due to practicality, this research will focus on some shopping centers in a city center, district centers, and an outside of the city (regional) area. The shopping

centers in this investigation have at least 10 stores and the sizes are more than 5000 m². Therefore, some small shopping centers, neighborhood supermarkets, or corner stores will not be discussed in this research.

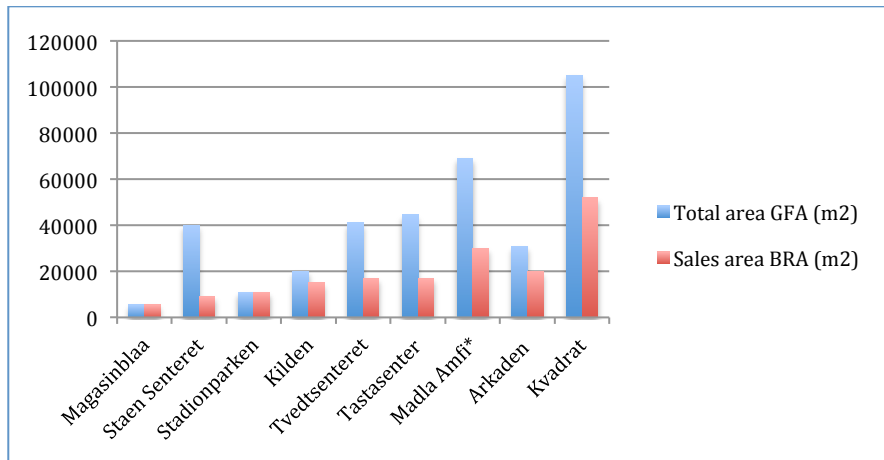


Chart 5 Comparison between sizes of the shopping centers. Sources: Norgesdigitalt, and generated by ArcMap's software

As previously mentioned, Stavanger municipality has seven districts, and three neighboring municipalities; Randaberg, Sola, and Sandnes. The organization of the city is decentralized with a center in each district. Each district center consists of some commercial buildings and local services including shopping centers

Table 8 Shopping centers in Stavanger district

District	Shopping center	Year of developed	Total area GFA (m ²)	Sales area /BRA (m ²)	Number of stores	Company operator
Tasta	Tasta senter	2012	44500	17000	43	OBOS
Eiganes & Våland	Straen Senteret	2000	40000	9000	18	Øgreid eiendom
Madla	Madla Amfi*	2007	69000	30000	80	AMFI Drift AS - Olav Thon
Storhaug	Arkaden	1988	31000	20000	60	Steen&Strøm
	Magasin blaa	2002	5500	5500	20	Tvedt eiendom
Hillevåg	Kilden	2004	20000	15000	60	Citycon
Hinna	Stadion parken	2005	11000	11000	25	Citycon
	Tvedt senteret**	2008	41000	17000	29	Tvedt eiendom
Lura, Sandnes	Kvadrat	1984	105000	52000	160	Store brand livsforsikring & AMFI Drift AS- Olav Thon

*Madla AMFI was developed from Madlahandelslag (opened in 1908)

** First Tvedt senteret was opened in the 1980's and expanded in 2008.

Based on Table 8, most of the shopping centers are located in the center of district. They were developed approximately around ten years ago. During the ten years between 2002-2012, Stavanger population has grown 16%, while Sandnes 23%. The growth was higher compared to population during the 1990s. Meanwhile, Arkaden and Kvadrat shopping center were established during the 80s. The first is

located in Stavanger city center while the latter is outside the city border. These shopping centers were the major shopping destinations because there weren't many shopping centers as today. About twenty years later, other shopping centers were developed in every district. An increased consumption and more modern lifestyle due to urbanization have put impacts to the development of the shopping centers. They upgraded their physical condition, size, interior organization, and also selection of the stores in order to fit those conditions.

In term of size, there is a specific regulation to determine *Bruksareal/BRA* or sales area for shopping centers in the district. It shouldn't be exceeded than 40.000 m². But there is an exemption for a shopping center in a city center and outside the city region. Both Arkaden and Kvadrat shopping center are allowed to have bigger size than other shopping centers. The size allowance is applied in order to strengthen commercial activity in the city center and to provide a wider range of products and services to cover inhabitants' need for the whole region. At the same time, Madla AMFI is the biggest shopping center and has the most number of stores than other district shopping centers.

Refer to Table 8, Madla is one of the biggest districts in Stavanger. In the future, there will be a big development in Revheim, which is around 2 km away from Madla district center area. There will be some commercial areas therefore the new development will address the needs of the district's inhabitants.

Hinna district is situated in the border of Stavanger and Sandnes and it is the second biggest district after Stavanger sentrum (Eiganes/Våland and Storhaug). There are two shopping centers there, but their types are not identical. Stadion parken is one of Hinna's shopping center that is surrounded by a residential and a mixed-use area. Meanwhile, Tvedt senteret is located in Forus neighborhood. Forus is the business and industry district of Stavanger. The shopping center offers some stores with big-sized products such as furniture, building material, and sports equipment.

When it comes to company operator, both Madla AMFI and Kvadrat owned by Olav Thon group, the biggest shopping center company in Nordic countries. Its strong economy and long experiences in managing shopping centers have lead to success in running the business including to pleased the customers.

5.2 Distribution of the shopping centers

Figure 5-2 shows that most of the shopping centers in Stavanger are located in the district center. Madla is located in the most western part of the city, but the district center itself is not situated in the middle of the district. In fact, it is further east to the border of Stavanger sentrum and Hillevåg. On the other hand, people who live in west Madla needs to travel approximately 2 km to the center. Based on Stavanger municipality's document plan, the west part of Madla, named Revheim, will be developed into a commercial and mixed-use area, so in the future, it can provides goods and services for the people living in that area.

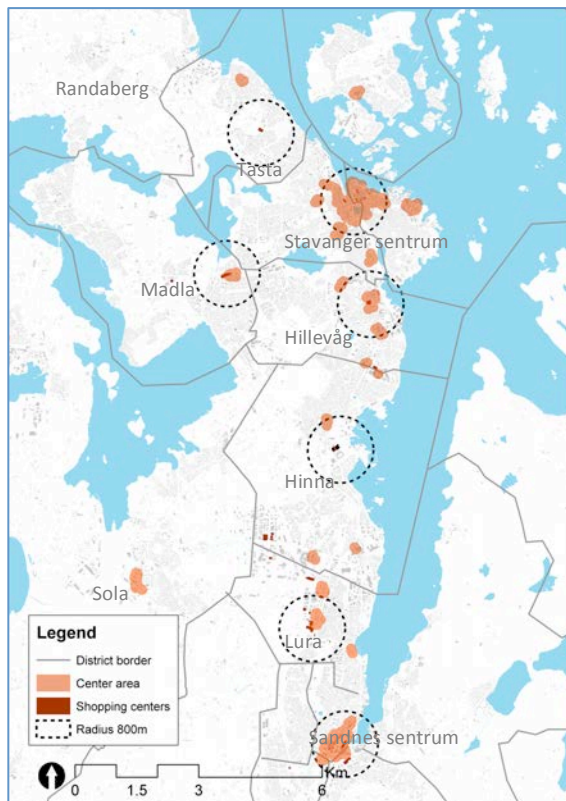


Figure 5-2 Shopping centers and the district centers area (R=800 m). Source: Norgedigitalt, ArcMap

By 2020, the busway project will be completed and it will run through every district center. It will eventually provide a sustainable travel choice for many trips including shopping trips. Meanwhile, Figure 5-2 shows that Kvadrat shopping center in Lura is the only one that has direct access towards E39 highway. Based on the previous studies by TØI (1998), a shopping center that is located next to a highway is very convenient for visitors yet in the same time it could increase private car use. The NSB railway passes through most of the districts in Stavanger except Madla and Tasta. The train goes through Stavanger sentrum area (Eiganes/Våland and Storhaug), Hillevåg, Hinna, and Sandnes sentrum. Unfortunately, this transport mode is not favorable for a shopping trip. Some of the reasons are the long distance and poor connectivity between train stops and the shopping centers.

Recently, Madla AMFI expanded its parking area and it now offers two hours free parking. This indicates that many visitors still use private cars to shop there. Stadionparken, Tvedtsenteret, Kilden also offer two hours free parking, Tasta senter offers three hours free parking, and even Kvadrat does not charge for its parking area. The parking facility is an instrument for a shopping center to attract more visitors, but at the same time, it contradicts the city plan's goal to reduce private car use. In a shopping context, people prefer to use a private car because it is convenient and easier for people who shop particularly for groceries.

5.3 Shopping centers and population

Figure 5-3, larger view in Appendix 2, shows the relation between density and the availability of shopping centers and commercial areas. There are many commercial buildings on the border between Lura and Hinna. The density of these neighborhoods is very low because the area consists of industry building blocks and agriculture. In addition, this area has the biggest shopping center that attracts many people from outside the neighborhoods. Madla does not have many commercial areas as Hinna and Lura but there is a big shopping center there that is expected to cover the high-density neighborhood. In the meantime, Stavanger sentrum has many commercial buildings but the sizes are smaller than the others.

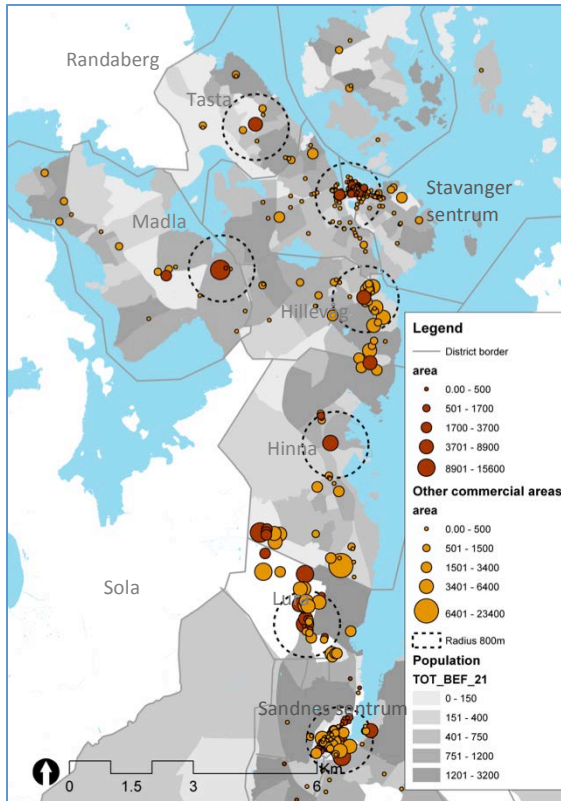


Figure 5-3 Number of population and the size of shopping centers (see Appendix 2). Source: Norgedigitalt, ArcMap

A shopping center in a district should be able to provide people's needs at least for those who live in the surrounding area. Based on Chart 6, Eiganes/Vålånd and Storhaug, known as Stavanger sentrum district, have the highest density therefore the shopping centers in that districts should be able to provide more goods and services to cover a larger number of inhabitants.

Chart 6 shows that Lura has both a low population and low density. It would not be economically sustainable if the shopping center only relies on visitors from the neighborhood. Besides, as a regional shopping center, Kvadrat is supposed to have a bigger trading area and provide a wider range of goods than a normal district shopping center. Therefore, Kvadrat shopping center recently added more stores and expanded its parking area. The development plan is expected to increase its turnover thus making it more economically viable.

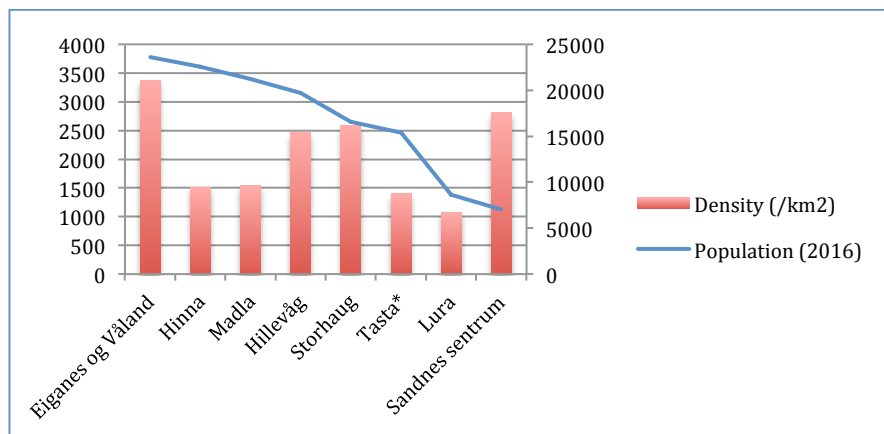


Chart 6 Population and density in Stavanger region. Sources: SSB 2016

Table 7 shows population growth in the districts. Stavanger sentrum area (Storhaug and Eiganes/Vålånd) has the highest growth rate. This indicates that the city has developed within the two districts. Hinna district, that is located on the border between Stavanger and Sandnes municipality, has a high growth rate as well. Rapid urban development in Forus and Jåttå has triggered this condition. It means that sprawling development has happened on the edge of Stavanger municipality thus connectivity between the city center and Hinna must be considered. The population may indicate how much or how many commercial and service areas should be available in the area in

order to cover the population's needs. If the commercial areas are available close to where people live, their shopping trips and travel distance will be reduced therefore creating a more sustainable environment.

Table 7 Districts area and population growth in Stavanger region

District	Area (km ²)	Population (January 2016)	Annual population growth (%)
Hundvåg	6,4	13217	0,8
Tasta*	11	15379	0,9
Eiganes og Våland	7	23616	1,7
Madla	13,8	21234	1
Storhaug	6,4	16544	3,5
Hillevåg	8	19681	1
Hinna	15	22581	2,1
Lura	8	8605	1
Sandnes sentrum	2,5	7015	1

Chart 7 shows that the lower the population is, the higher the number of commercial buildings available in a district is. Lura and Hinna have a low population but the total gross floor areas of commercial buildings in the districts are high. The reason is that less populated areas provide more vacant land to be developed into certain types of shopping centers. Another reason is that there is a big industrial and commercial area in Lura and Hinna, known as Forus, and there are not many residential areas in those neighborhoods.

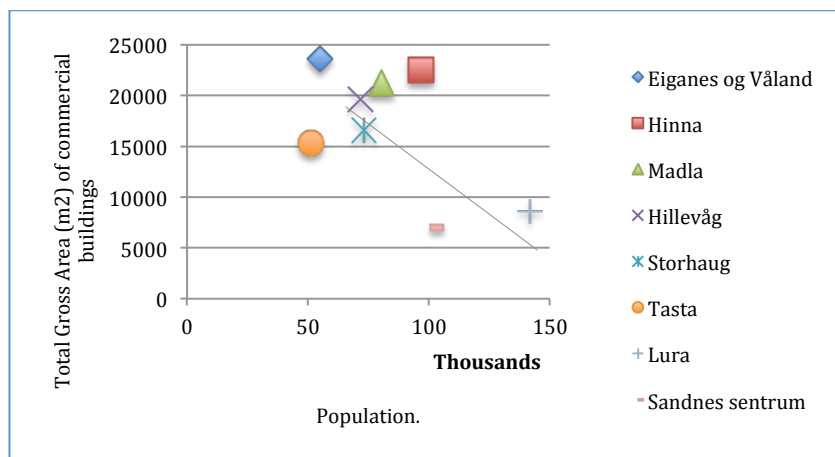


Chart 7 A relation of population and total gross area (m²) of commercial building. Source: SSB 2016, Norgedigitalt.

Based on research by TØI (2008), BRA of the shopping centers in Stavanger will increase 40% within fourteen-year period from 2006-2020. That means in 2020, total BRA will reach 205.000 m² in Stavanger. Meanwhile, Sandnes' shopping centers will increase 30% so the total BRA for shopping centers in 2020 will reach 213.000 m².

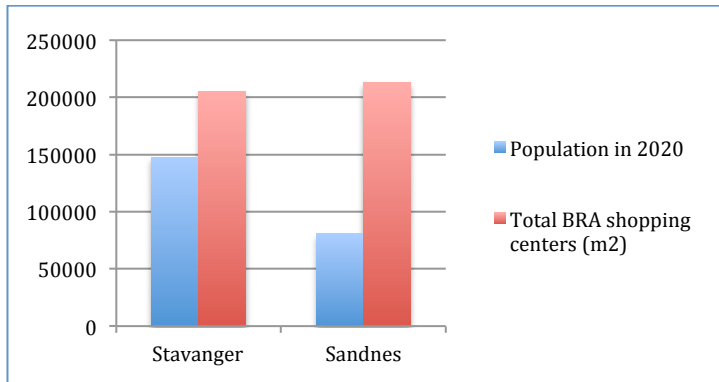


Chart 8 Development of shopping centers and population in 2020. Source: TØI

The population in Sandnes in 2020 will be less than in Stavanger, meanwhile the number and size of the shopping centers in Sandnes will be larger than in Stavanger. The prediction is that people from Stavanger will be attracted to visit shopping centers in Sandnes, thus increasing the travel distance.

5.4 Districts' turnover and total retail in 2015

The total turnover in a district is influenced by the number of commercial buildings and total gross floor area available in the district itself as shown in Appendix 1. Lura has a total commercial area of 140.000m2. It is the highest among other districts in the region. This total area presents Lura as the district with the highest turnover as shown in Chart 9. On the other hand, shopping centers in Lura such as Kvadrat and IKEA could only cover fewer households within the walking distance due to the low-density number. Therefore, most visitors to the commercial areas in Lura come from other districts.

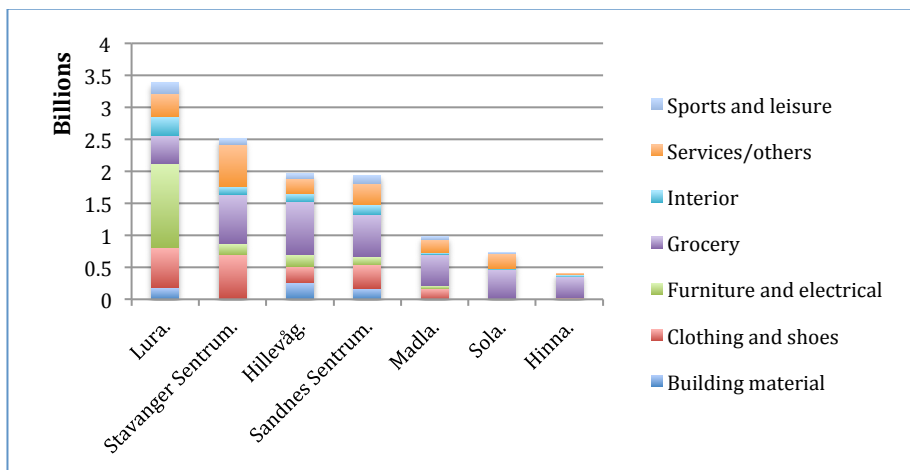


Chart 9 Districts' turnover and total retail sold in 2015. Source Spare-Bank1 2015

Appendix 1 also shows the distribution of shopping centers throughout the Stavanger region. Some of the shopping centers are located on the border of the district. It indicates the possibility of people to travel crossing from one district to another in terms of shopping. The most available shopping centers in a district may attract visitors

from other districts. The migration to different districts results in the loss of turnover in the home district.

Chart 10 from the research investigation shows that the more commercial buildings there are in a district, the higher turnover the district will obtain. Lura has the largest size of total commercial buildings therefore the district has the highest turnover. Both Stavanger and Sandnes city centers have an almost equal size and the turnover is almost the same. Meanwhile, Hinna has many totally commercial buildings but its turnover happens to be the lowest. This happens because Hinna does not offer types of retails other than grocery stores.

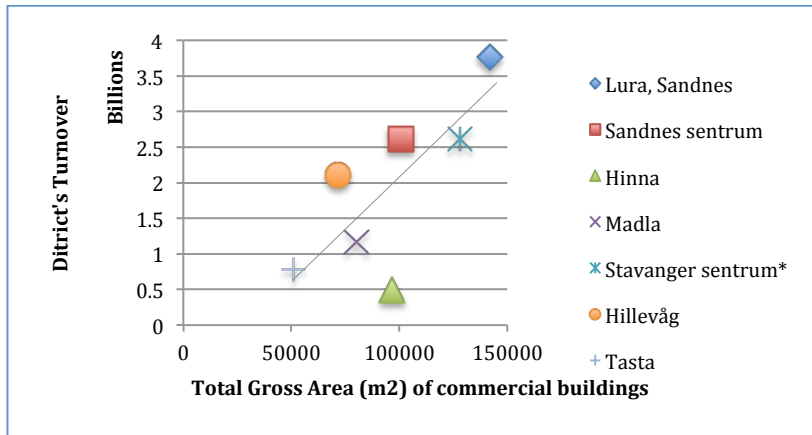


Chart 10 The relation between district turnover and total GFA (m2) of commercial buildings. Source: SSB 2015, Spare Bank 1 2014.

Chart 11 shows that apparently, when the population is low, the district's turnover is high. This condition is especially evident in Lura and Sandnes sentrum. Based on Chart 10 and 11, there is a strong relation between population, turnover, and the size of a shopping center.

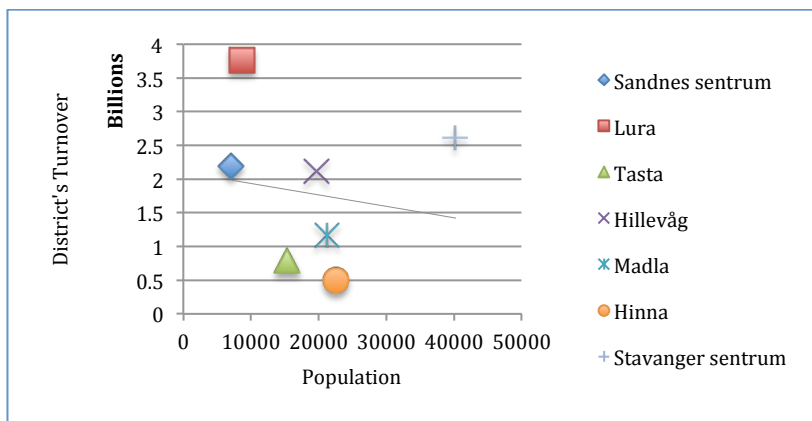


Chart 11 The relation between turnover and a district's population

5.5 Shopping centers' visitors and turnover.

The research found that high number of visitors does not necessarily indicate that a shopping center will obtain a high turnover. Referring to Chart 12, Arkaden shopping center has the most visitors but its turnover is low. At the sametime, Kvadrat shopping

center has the highest turnover and it also has the largest number of visitors. This condition happens due to the different locations in which those shopping centers are situated. Arkaden shopping center is located in Stavanger city center, where there are many interesting public spaces available. People visit Arkaden not only for shopping but they also visit the public places in the city center. They generally want to enjoy the city center's environment and to visit Arkaden is a part of the experience. In addition, Arkaden has many entrances that connect it to many parts of the city center, and therefore many people just walk through Arkaden as a way to reach a particular destination outside of the shopping center. The same situation also happens in a shopping center in another city center such as Amfi Vågen in Sandnes city center. It can be said that visitors to the city center's shopping center are not purchasing as much as visitors in the district shopping centers. The development of shopping centers in the city centers may not attract visitors to shop in the shopping centers because the visitors have more options other than shopping therefore the turnover level is unpredictable. Meanwhile, some shopping centers that are not located in the city center such as Madla AMFI, Kilden, and Kvadrat has a consistent proportion between turnover and number of visitors. Obviously, the visitors deliberately visit the shopping centers for a shopping purpose.

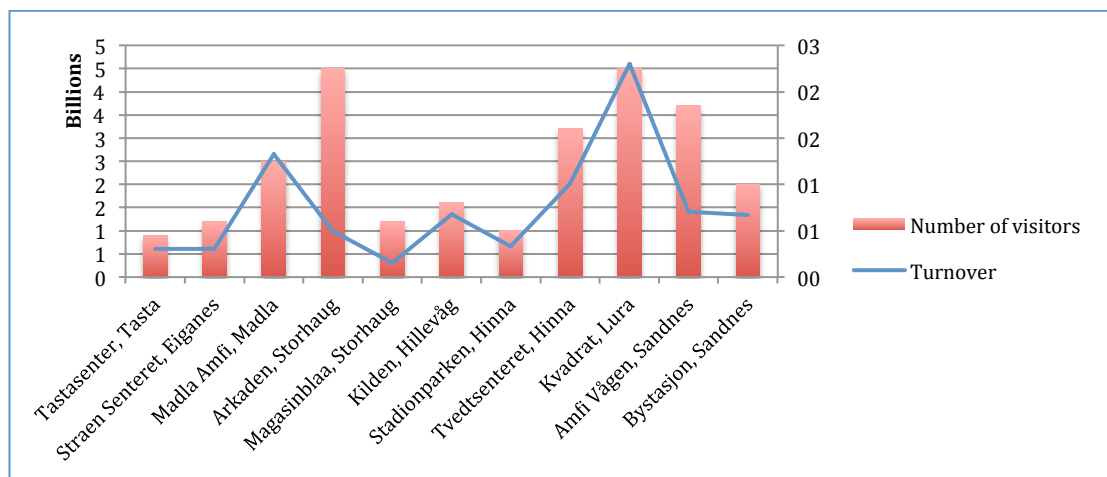


Chart 12 Number of visitors and turnover 2014/2015

Kvadrat is located outside of the city center. Most of the people who visit the shopping center purchase something. It has the biggest size and the most stores therefore Kvadrat shopping center has the highest turnover and number of visitors. Madla Amfi has the highest turnover among the other district shopping centers and the visitors are also consistent with its turnover. One of the reasons is that Madla Amfi is the biggest district shopping center in terms of sales area/BRA.

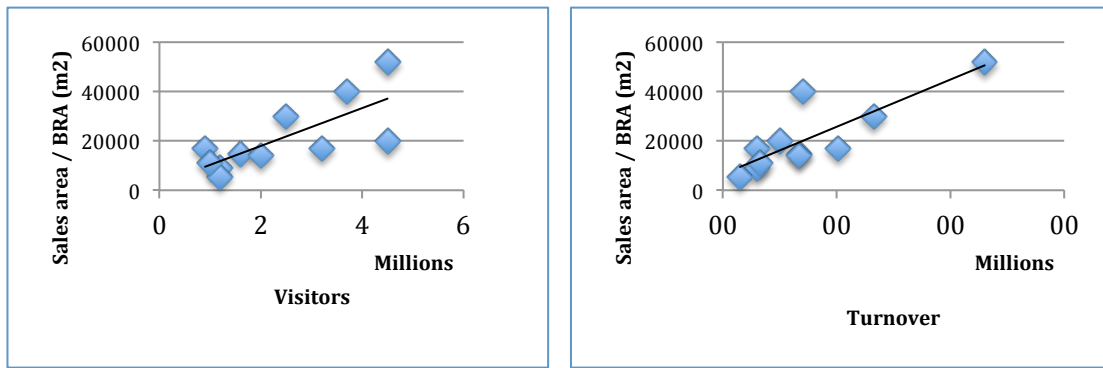


Chart 13 The relation between Shopping centers' size, turnover and visitors. Sources: Factsheets, Spare Bank 1

Chart 13 shows that the size of a shopping center gives impact to its viability. Big shopping centers offer a wider range of products than the smaller ones therefore attracting more visitors. As mentioned in the previous paragraph, a high number of visitors do not always contribute to a high turnover, but still contribute to a stronger possibility of obtaining a higher turnover depending on the location of the shopping center.

5.6 Retail goods sold in the districts

Previous study by TØI (1998) proved that 25% of trips in Norway are shopping trips. One third of the shopping trips are for grocery shopping. Apparently, a lot of people also shops for groceries in the shopping centers besides in the grocery stores nearby them. Most of the shopping centers in Stavanger provide a big grocery store. It provides practicality to their visitors to undertake various retails purchases in one shopping center. Chart 14 shows that groceries is the main type of retail purchased by the people in the districts, except in Lura. The proportion of grocery shops in Lura is lower than furniture-electrical and clothing-shoes shops. The reasons are Lura district has some big shopping centers that sell furniture goods such as IKEA, Skeidar, and Jysk. Kvadrat shopping center in Lura mostly sells clothing goods including shoes, bags, etc. Lefdal and Expert are big electronic stores in Lura. These conditions make the grocery retail inferior.

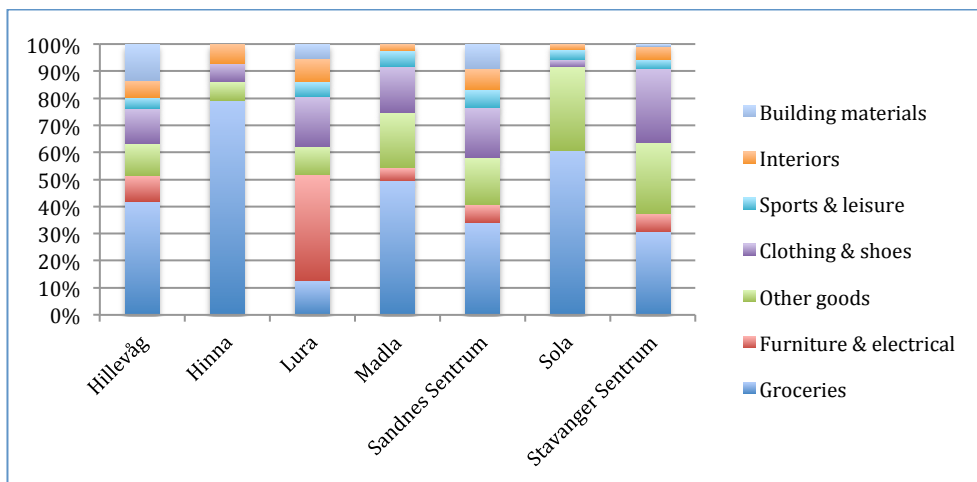


Chart 14 Proportion of retail items sold in the districts. Source: Spare-Bank1 2015

Chart 14 shows that the grocery shopping is dominant in most of the district shopping centers except in Kvadrat, Lura. The reason why Kvadrat's grocery turnover is low is because the shopping center offers more other retail than just groceries.

5.7 Shopping centers and mobility

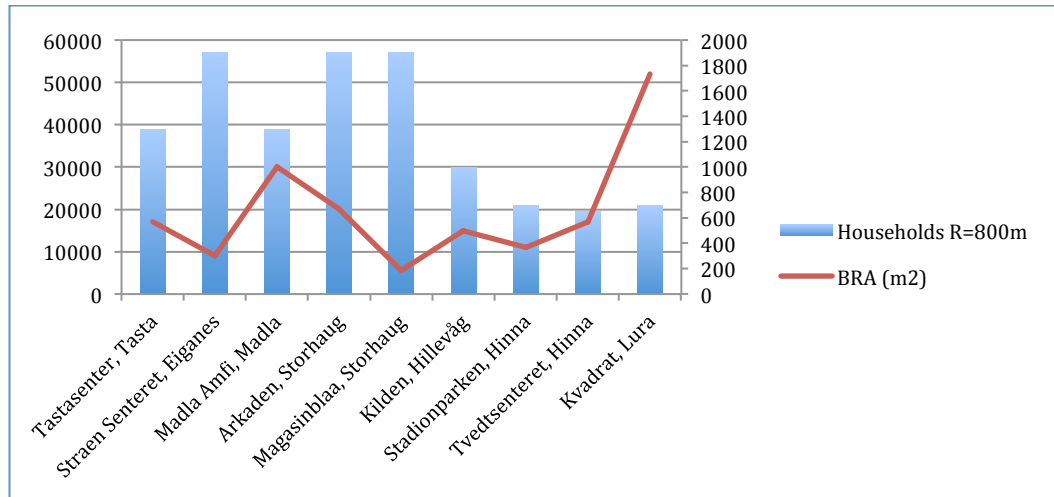


Chart 15 Shopping centers' size and number of households in walking distance.

The research as shown in Chart 15 found that only three shopping centers have more than 1400 households in a radius of 800 meters. They are Straen senteret, Arkaden, and Magasinblaa, which all are located in the city center. This group of people will have a shorter travel distance to the shopping centers. Moreover, people who live close to shopping centers tend to use environmentally friendly transportation such as walking or bicycle and therefore contribute to a sustainable environment. Meanwhile, people who live 1 km away from the shopping center tend to use cars (Lunden, 1994). On the other hand, the sizes of these shopping centers are smaller than the others such as Madla AMFI and Kvadrat. These big shopping centers attract many visitors and it is very important to keep the surrounding area dense thus the shopping centers have more visitors who travel for a shorter distance. At the same time, the shopping centers in Hinna could only reach approximately 800 households within its 800 m radius of walkable distance while the population of the entire district is actually high. It means that the distribution of people in Hinna is not concentrated in the district center, and this could triggers to the shopping trips by private cars.

Pedestrian infrastructure is always available towards the center areas as it is one of the requirements in developing a shopping center in Stavanger. Therefore, there should not be an accessibility issue for people to walk to a nearby district center/shopping center. But this kind of transport mode does not always suit those who do grocery shopping. Moreover, people who live more than 1 km from a shopping center tend to use a private car. Referring to Asplan Viak (2007), half of the shopping trips were shorter than 3 km and 71% of them were by private cars, and people on average do their grocery shopping within 1.6 km from their home. This means that many people will use cars for their shopping trips even when the shopping center is located within their district.

The shopping trip pattern is also influenced by job location. It is common for someone to shop while they from/to their workplace. The Stavanger region has some major industry areas where a lot of people work. Those are Dusavik (near Randaberg municipality), mostly having petroleum industry companies, Forus that is new and the most important industry area, and the old industry area in Hillevåg.

5.8 The regional shopping center and the two city centers in the Stavanger region.

A regional shopping center and a city center are an inseparable discussion in the context of urban planning development. Most shopping centers have developed after the old city center. The development of shopping centers has some advantages such as providing new and interesting possibilities for shopping and new public places for people. But the advantages are accompanied with some disadvantages such as the deterioration of the old city center due to the migration of its visitors towards the new shopping centers.

Kvadrat regional shopping center is located 13 km away from Stavanger city center and 4 km from Sandnes city center. The location is in a low density area and thus indicates that many visitors are coming from outside of the district. The trips to Kvadrat can be both by a public transport or a private car. In order to achieve sustainability, a better public transport system should be available near Kvadrat. In addition, the area should be densified so that many visitors will have shorter travel distance to the shopping center.

However, there are some qualities that cannot be found in Kvadrat such as culturally enriching activities, a waterfront, livability, and other distinctive environments that people often find in the city centers. On the other hand, the city centers do not provide free toilets, equipment for disabled people, convenient indoor spaces against unfriendly weather, and they do not offer a wide range of product such as Kvadrat does.

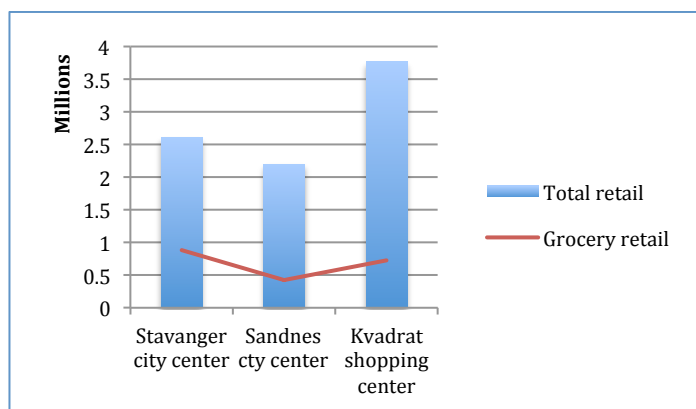


Chart 16 Comparison of trading between the two city centers and the regional shopping center.
Source: Spare-Bank 1

From Chart 16, Kvadrat's total retail exceeds the two city centers. However, the competition between them is not only based on the turnover, but also on the number of visitors and the livability aspect. All of them have a good number of visitors. In Kvadrat, the total retail is consistent with the number of visitors. If so, to gain more turnover,

Kvadrat should develop or expand the shopping center and thus attract more visitors. On the other hand, the city centers might encounter an issue of limited space to expand the shopping area. But the city centers could increase their livability by upgrading their historic buildings and adding more cultural activities.

5.9 Characteristic of the shopping centers in Stavanger

5.9.1 Physical aspect and surrounding area

Shopping centers in the Stavanger region have typical design forms as shopping centers in the US. They are indoor-buildings with an opaque façade. Closed walls and few numbers of entrances hinder the relation between the inside area of a shopping center and the outside environment. The condition is precisely shown as Victor Gruen described about an introvert shopping center that is the direct entrances toward stores in a shopping center are exclusive from public pedestrian area.



Figure 5-4 Kvadrat shopping center. Source: Sandnesposten.



Figure 5-5 Madla AMFI shopping center. Source: Olav Thon Eindom

Kvadrat shopping center, shown in Figure 5-4, is located outside of Stavanger city. Like regional shopping centers in other countries, this type of shopping center is often built in a low-density neighborhood, next to the highway. The advantage of building a shopping center in this area is cheaper than in a city with high prices property. To reduce building costs, parking areas in the shopping center is designed on the ground instead of under the ground. Consequently, the huge parking lot creates a gap between the public environment of the surrounding area and the shopping center itself. Meanwhile, Madla AMFI, shown in Figure 5-5, is one example of a district shopping center that is built in a populated area. The size and height of the shopping center is strictly regulated by the city. Due to the building ratio limitation, most of its parking areas are placed underground.

5.9.2 Transportation networks

Figure 5-6 shows transportation networks in the region that allow people to travel in a short time. Both the E39 highway and the railway stretch along the north-south axis of the region. Apparently, only three district centers have direct access to a railway station; these are Stavanger sentrum, Hinna, and Sandnes sentrum, and only one district center has direct access to the highway, which is Lura. However, people prefer to use the train for longer commuting trips rather than for shopping trips. This condition enforces people to use other

transportation networks such as normal roads to go to the district shopping centers and travel time takes longer than the highway or the railway.

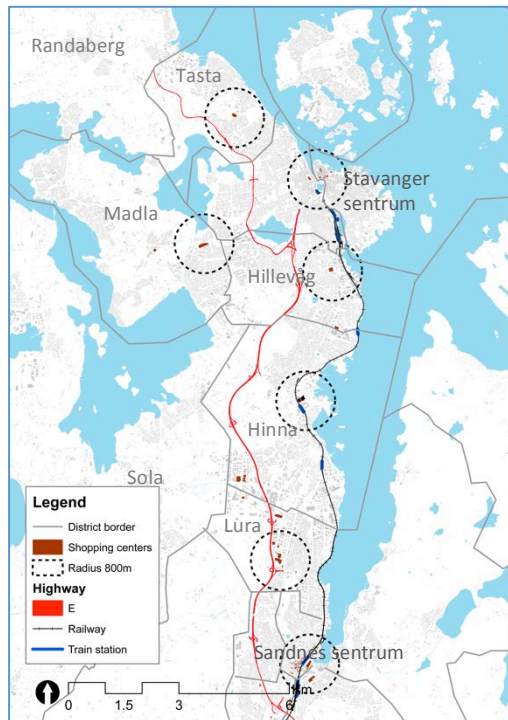


Figure 5-6 Shopping centers' neighborhoods and the main transportation networks. Sources: Norgedigitalt, ArcMap software

Figure 5-7 shows that the Annual Daily Traffic (ADT) along the highway is highest especially from Hillevåg and Lura. The high amount of traffic in this area is mainly because of working trips to Forus. In addition, the main road located along the railway is also busy especially from Stavanger sentrum to Hinna. Surprisingly, traffic around Arkaden shopping center and the pedestrian street (A) in Stavanger sentrum are less busy than the other district shopping centers' traffic.

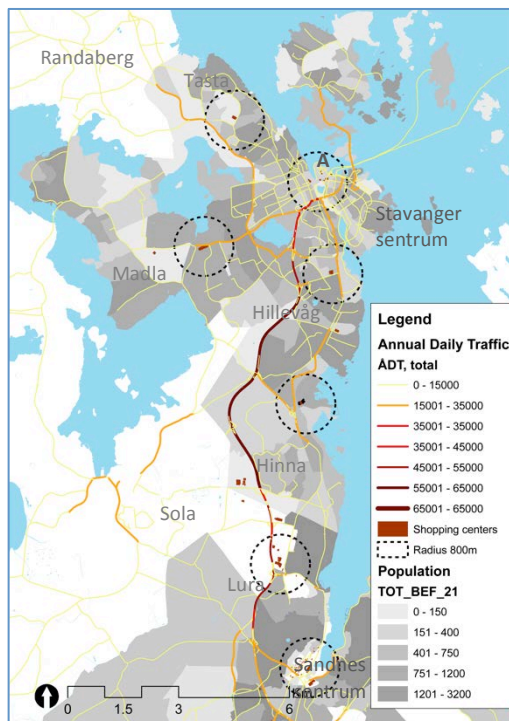


Figure 5-7 Annual Daily Traffic in Stavanger region (see Appendix 3). Sources: Norgedigitalt, ArcMap software.

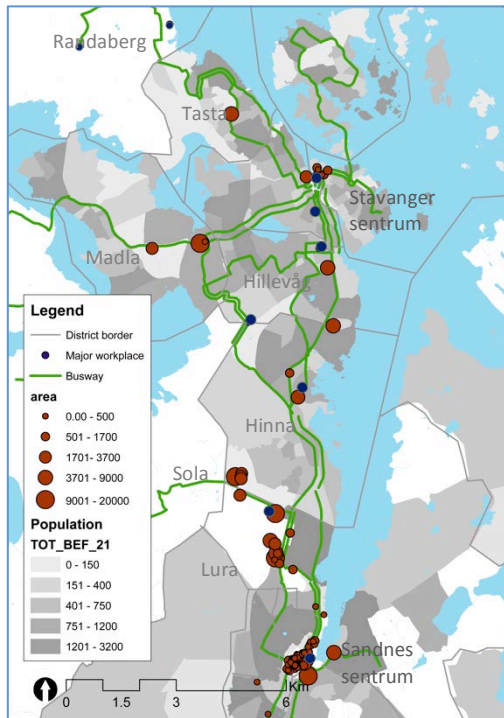


Figure 5-8 Busway networks, population, and the shopping centers' sizes (m2) (see Appendix 4). Sources: Norgedigitalt, ArcMap software

The busway routes in Figure 5-8 run on the arterial roads and connect most of the neighborhoods in the region. They also reach many high-populated areas, big shopping centers, and workplace hubs. The adjacency between shopping centers and workplace hubs will promote linked trips and therefore reduce the number of trips between home and destinations. For example, travelling from the workplace and directly to a shopping center nearby before turning home. The busway is expected to reduce the traffic volume by private cars to these areas. However, the busway project is not accomplished yet. It will be finished by the year 2020.

5.9.3 Stores and facilities in the shopping centers

Shopping centers in the Stavanger region offer a wide range of products and services. However, a grocery store in the shopping centers is often the biggest one and it provides higher quality products than in common grocery stores within the neighborhoods. A typical regional shopping center used to have big department stores as their anchor stores such as Macy's in the US or Marks and Spencer in Britain. Department stores are perceived differently in the US and countries in Europe. In the US, it provides a collection of goods satisfying all possible human needs, except groceries, under one roof, meanwhile in Europe groceries is often represented in a department store (Victor Gruen, 1970). In Stavanger, there is not any department store present neither in the regional shopping center nor the district shopping centers. Instead, the grocery store is likely to act as an anchor store for the shopping centers due to its size. Based on the literature review, a particular size of a grocery store in a district shopping center determines the economy of the whole shopping center. It is also the commercial engine that supports most of the smaller stores. In order to be economically sustainable, a district shopping center in Stavanger needs around 50.000 people within its primary trade area. The trade area is varies, from 6 to 10 km radius. Based on this research calculation aided by ArcMap software, most of the shopping centers are economically viable based on the trade area indicator. The trade area of the shopping centers in the Stavanger region is able to cover between 75.000 – 140.000 people as shown in Chart 17. If a shopping center could not reach a certain number

of households within its primary trade area, then it needs to be developed in other ways in order to attract more visitors.

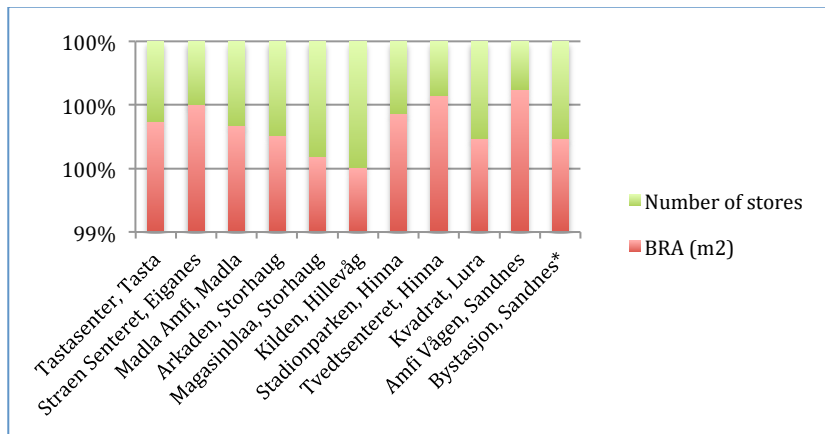


Chart 17 Number of stores and BRA (m2). Source: The shopping centers' sheetfacts.

Parking is one shopping center facility that can attract more visitors. At the same time, a big parking area could increase the use of private cars. The proportion of parking lot and BRA size in Magasinblaa, Arkaden, and Amfi Vågen shows that these shopping centers prioritize pedestrians over cars as shown in Chart 18. Besides, three of them are located in the city center where a public parking hub is available. Meanwhile, the proportion of parking is bigger than the BRA size in Stadion parken, Tvedtsenteret, Kvadrat, and Bystasjon shopping centers. Many shopping centers expand their parking area in order to accommodate the high demand of it. Madla AMFI is the shopping center that recently expanded its parking area as the number of visitors keeps increasing.

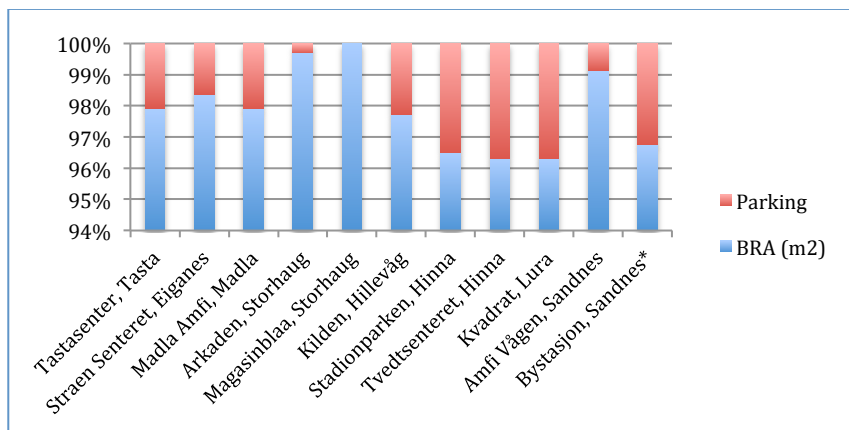


Chart 18 Number of parking and BRA (m2). Source: The shopping centers' sheetfacts.

Shopping centers that have more cafés and restaurants provide more public spaces. These facilities can fulfill the desire of spending more time for socializing. People visit shopping centers not only to “shop and go”, but also for experiencing, judging products, comparing, and so on. Therefore, as Victor Gruen (1973) said, shopping activities in a shopping center is a time consuming and rather tiring activity therefore it should be designed in a way so that people can enjoy and feel comfortable in it. In the US, many shopping centers' interiors are equipped with attractive landscape seating areas, eating facilities, movie theaters, lecture rooms,

etc. Some big shopping centers in the US even have an indoor amusement park or waterpark facility in order to gain more visitors. The more a shopping center offers spaces for socializing and recreation, the more visitors it will have, and they will stay longer in the shopping center. Meanwhile, most of the shopping centers in Stavanger do not offer those facilities but only eating facilities and some simple sitting benches.

All of the shopping centers in Stavanger provide toilets and some of them have nursery rooms. Apparently, these facilities are very important for some visitors, especially for certain group of visitors such as women with small children. Victor Gruen (1973) explained that women who have some time on her hands are the largest part of the shopping army, especially in a typical regional shopping center. In Stavanger shopping centers, it is very common to find a group of women with children enjoying their mingling time in a warm and convenient shopping center, especially during winter or wet seasons.

5.10 The vibrant city center in the region; 'Stavanger sentrum'

A lot of city centers across the world experience deterioration of their old city center. Many believe that the development of new shopping centers has killed the city center. To some extent, that condition might occur if sprawling development and decentralization continues to happen and people prefer to visit shopping centers instead of a city center. The city center is the heart of a city and should always be kept healthy and well functioning. Therefore, it is important to preserve a city center. In addition to commercial program and shopping uses, the city center need to include other suitable uses such as working, dwelling, sightseeing, participating in civic, social, cultural, recreational and spiritual events (Victor Gruen, 1970). These functions will attract great numbers of people thus making it 'healthy' and viable.

An attractive city center should be composed by some main functions such as; residential, government, private business administration, trade, and culture and art. Fortunately, those functions are represented in Stavanger sentrum:

- Residences: a city center without any people living in it will become dead during non-working hours. The problem is, not everyone desire to live in the city center. The ideal core population can be formed by students, artists, intellectuals, scientist, or those who love sociability and those who appreciate living in their place of employment.
- Government:
- Private business administration:
- Trade:
- Culture and art: (including historic preservation)

In order to attract people, a city center must have strategies for designing components of the city center. There must be good arrangement of buildings and spaces, and streets and traffic. The management must bring about a good environmental condition, good accessibilities, and active public open spaces. However, Stavanger sentrum does not exclude vehicular traffic in the center area except in the pedestrian street area. The traffic condition may create an unpleasant experience for pedestrians

when they are in an immediate distance to the traffic. At the same time, Stavanger sentrum has good accessibility by public transport. There are some transport mode choices towards Stavanger sentrum such as NSB train and bus. But due to its less restriction of car use in Stavanger sentrum, a lot of people still prefer to use cars instead of public transport.

5.10.1 Stavanger sentrum strength/assets

Based on the observation, Stavanger sentrum is a lively city center. It attracts many people and offers several activities such as cultural activities, shopping, sightseeing, transit, and so on. So far, many activities have taken place in the central library involving families and children in the city. Eventual concerts by the fjord, regular international events, or small community 'food tasting' events are some of the activities that enrich Stavanger sentrum as a main leisure venue as shown in Figure-9 below.



Figure 5-9 The festivity during 'Gladmat' international food festival in Stavanger sentrum.

In terms of commercial, Chart 9 in page 44 shows that Stavanger sentrum has a high retail turnover which means many people consider Stavanger sentrum as a place for shopping. The city center eventually has become a multifunctional hub for people in the city. A strong partnership between the municipality and private actors increase the sense of community for the city. Moreover, Urban Waterfront development in the eastern part of Stavanger sentrum shows the concern of improving blue-green infrastructure of the city. The city center really intends to maintain both physical and non-physical aspects of the city center.

From the investigation, Stavanger sentrum has successfully maintained its high density levels, emphasized historic preservation, developed civic public places, enforced design control, maintained street level activities, and provided a multifunctional city center.

Below is a city center development strategy that has been applied in Stavanger sentrum:

- Main street approach, new office development, waterfront development, convention center, pedestrianization improvements, parking facilities, tourism, centralized retail management, downtown housing, transit improvements, indoor shopping center, traffic circulation changes, nightlife/entertainment, pedestrian mall

In addition, Stavanger municipality established an organization for Stavanger sentrum. The goal is to nurture both the city center's physical aspects and the activities inside it. Some of the points in the plan are:

- Strengthen the existing and establish new urban spaces
- Improve accessibility for pedestrians, cyclists, transit, etc.
- Establish good sized and appropriate place parking hubs.
- Strengthen programming of rental properties. (original text: Styrke programmeringen av utleielokaler)
- Establish several events to keep the city center active.
- Keep the city center safe and clean.

The ministry of local government and regional development (kommunal- og moderniseringsdepartement) developed a concept called CID (City Impact District) for Stavanger sentrum. The plans are to make Stavanger sentrum into a multifunctional urban development, develop some smaller projects to keep the dynamic of the city center, to increase positive competition with other districts in the city. So far, the concept has worked well as many parties have supported it.

Chapters 5 findings:

- *Size regulations of shopping centers in Stavanger region are varies depend on the geographical contexts. The city center's shopping centers can be developed bigger than the others. This regulation helps to avoid undesirable competition between shopping centers and commercial areas in the city center therefore it could keeps the viability of the city center. In addition, size limitation for the district shopping centers could controls consequences to the neighborhood such as infrastructural or traffic conditions.*
- *In Stavanger, the population determines the number of commercial areas available in an area.*
- *Population growth in a neighborhood should be compensated by adding more commercial areas. If the commercial area are available close to where people live, their shopping trips and shopping distances will be reduced therefore create more sustainable environment.*
- *The size of the shopping centers in Stavanger region could determines its turnover value.*
- *The location of the shopping centers in Stavanger region could determines the limit size of the shopping center's development. A big shopping center often located in the low density and vast vacant area.*

- *Particularly in the city centers, the visitors tend to utilize the shopping centers as a part of city center's leisure space instead of solely as a shopping place. Meanwhile, visitors in the district shopping centers consider it as shopping destinations and they will focus on purchase something.*
- *The size and number of stores of the shopping centers in Stavanger could determine the number of visitors and the turnover.*
- *In Stavanger, providing a grocery store in the shopping centers is very important in order to attract more visitors and obtain high turnover.*
- *A big shopping center in a low density neighborhood such as Kvadrat creates more travel distance. A long travel distance means leaving more carbon footprints by vehicular transportation modes.*
- *People will use private cars for grocery shopping even the distance of the store is not requiring them for using the cars.*
- *Arkaden in the city center is the only commercial neighborhood that has less-busy traffic. The city center has been successful in managing high number of visitors with less vehicular traffic than the others.*
- *Stavanger sentrum is a vibrant city center that has many interesting public spaces and mixed-use functions therefore the city center attracts many visitors. In turns, the shopping centers in the city center will take the advantages from this situation.*

6 THE MAJOR SHOPPING CENTERS IN STAVANGER REGION

This chapter examines specific shopping centers based on contexts and types; Arkaden in the city center, Madla AMFI in Madla district, and Kvadrat in the periphery of the Stavanger city. This chapter discusses the recent condition of the shopping centers, the situation of the neighborhoods, and the relation with transportation. In addition, the chapter presents the result from the interviews as well as personal observations. The research is trying to address the research questions about the shopping centers and the neighborhoods and to what degrees they are able to integrate with the surrounding area. Besides, the chapter also tries to explain if the transportation choices for the shopping trips are sustainable.

6.1 Arkaden, Stavanger sentrum

Arkaden is one of the oldest shopping centers in Stavanger. It is located in the heart of the city center, known as Stavanger sentrum, adjacent to the pedestrian street. Referring to the interview with Arkaden's marketing manager, the shopping center and the pedestrian street are interdependent from one another. On one hand, the pedestrian street contributes to the added number of visitors for the shopping center, whereas the shopping center provides some facilities such as toilets and an infant changing room and some foreign chain stores that are not available in the pedestrian street. Apparently, the shopping center and the pedestrian street share the same visitors and most visitors in Stavanger sentrum will visit both of the shopping areas.

The marketing manager convinced that the shopping center has a good relation with the pedestrian street. Both of them are members of the city center's organization (Stavanger sentrum AS / STAS) that manages approximately 320 member stores in the city center. The good relations between them can be found from the availability of several accesses from the shopping center to other buildings in the pedestrian street such as direct entrance to a bank, a grocery store, and a big café.

Stavanger sentrum consists of the two districts Eiganes/Våland and Storhaug, and it has the densest populated area with approximately 2500 people per square kilometer. The classification of the center is *hovedsenter* or a regional center for Rogaland county. It is also a district center for Eiganes/Våland and Storhaug. The commercial areas in the city should be able to address the demands of both people in the region and the neighborhood. Due to the broad scope of the center, Stavanger sentrum has the biggest functional area for commerce, business, cultural institutions, and public spaces. The functional area spans around 0.4 km², meanwhile the whole center area is nearly 1 km². Stavanger sentrum also has a fine grain urban fabric. It consists of several small buildings and mixed activities. The richness of its urbanity creates an attractive and lively city center.

Based on the planning and building act or *Plan- og bygningsloven* (PBL) § 11.10, Stavanger sentrum has no certain size limit for developing or expanding its commercial area. The reason is that Stavanger sentrum is expected to be the main commercial hub

for people in the region therefore it needs bigger and more various types of commercial places

6.1.1 Physical characteristics

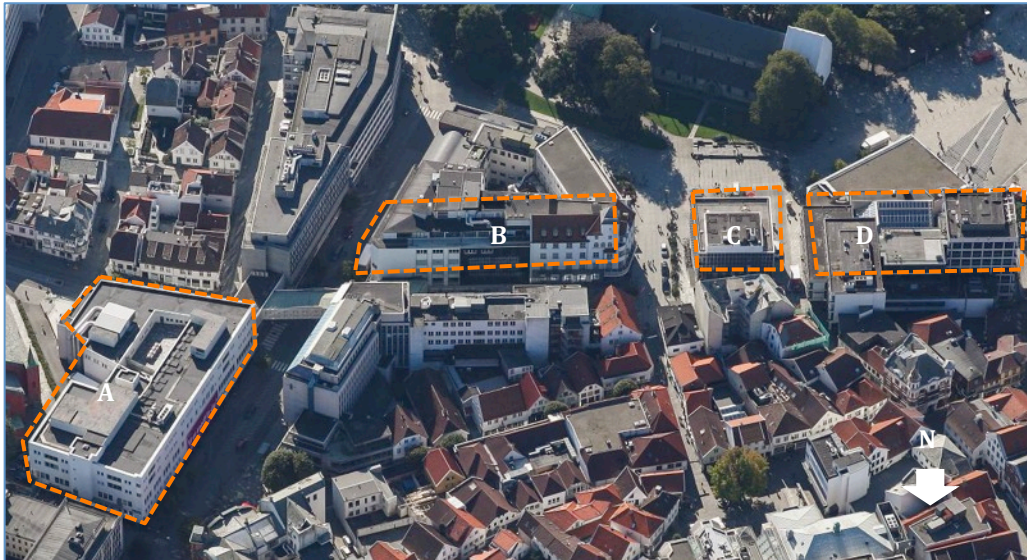


Figure 6-1 Arkaden shopping center's buildings

Unlike other shopping centers in Stavanger, Arkaden shopping center is composed by several building blocks. The existing dense area forced Arkaden to be constituted by spread and smaller building blocks. Building A and B are the oldest and opened in 1988. Building D opened in 1998, while building C opened in 2000. People used to call Arkaden Stavanger Storsenter but in the early 2011, the shopping center launched the new brand name Arkaden Torgterrassen.

The linearity of Arkaden's cluster, which is shown in Figure 6-1, emphasizes flow of circulation from/to west and east. From the research observation, Arkaden has several entrances that connect different part of the city center.

6.1.2 Facts

Based on the factsheet, Arkaden is owned by Steen& Strøm AS. The shopping center was established in 1988, 1998, and 2000.

Name of shopping center	: Arkaden Torgterrassen
Location	: Stavanger sentrum (city center)
Total Area	: 31.000 m ²
BRA	: 20.115 m ²
Number of stores	: 60
Parking	: 70
Visitor in 2015	: 4.5 million
Turnover in 2016	: 0.5 billion kr

The size of Arkaden shopping center is in the category of community shopping center with a trade area up to 8 km. It provides goods and services to two districts;

Eiganes/Våland and Storhaug. Simultaneously, the location of Arkaden in the city center is in the category of a region center with a trade area between 16-19 km. The trade area for Arkaden as a region center means that the facilities offered there should be able to cover a broader area such as Randaberg, Sola, and Sandnes municipality.

Based on TØI (2010) in the previous chapter, the average acceptable walking distance for a region center and district center is 800 m until 1,5 km. The population within 800 m distance from Arkaden is around 7.400 people while the population in radius 1,5 km is nearly 25.000 people. However, the population within the border of the city center is not as large as it is outside the border (see Figure 6-5, p.64). The residential areas start to become denser from the periphery of the border.

Asplan Viak (2007) has explained that there would be fewer people who do shopping trips if the distance is more than 8 km from their home. Meanwhile, the optimum distance for shopping trips is 2 km from their home. When the 8 km is stretched from Arkaden, the primary market of this shopping center consists of three municipalities; Stavanger, Sola, Randaberg and some area in Sandnes. Meanwhile, people who live in Stavanger sentrum, Hillevåg, Tasta, and Hundvåg will have travel the optimum travel distance for shopping trips. Referring to the marketing manager, 75% of the visitors are people who live in Stavanger municipality and around 10% of them are visitors who live in Sola, Sandes, Randaberg, and Finnøy.

When it comes to turnover, Stavanger sentrum has a balanced proportion of retails sold; clothing and shoes, groceries, services and others. Services/others turnover come from restaurants/cafes, cultural activities, and health institutions. Apparently, there is no single dominating retail types (Chart 19), which means the city center provides equal amount of retails and the visitors purchase various goods and services there.

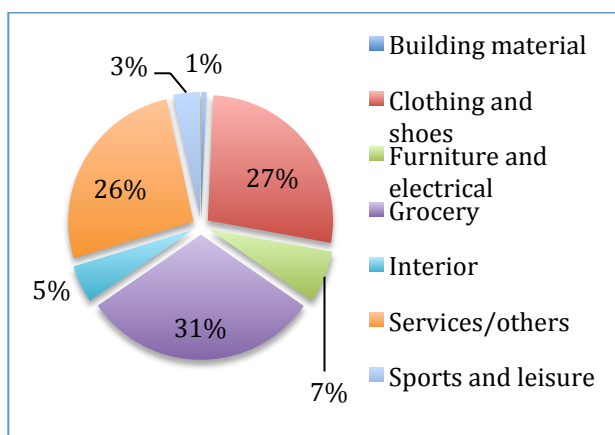


Chart 19 Retail allocation in Stavanger sentrum. Source: Spare-Bank1 2015.

Based on Chart 20, the turnover in Arkaden shopping center only reaches one fifth of the total turnover in Stavanger sentrum. This condition occurs because the shopping center offers limited retails and most of them are fashions/clothing and shoes. There are two types of customers in Arkaden; the first group is customers

who visit both the pedestrian street and the shopping center and they do several errands including shopping. The other group is customers who only visit Arkaden although referring to the marketing manager, most of Arkaden’s customers are also visit the pedestrian street. Therefore, both the shopping center and the pedestrian street should be considered as one important economic engine’s unit for the city center. She also added that the ability to create interesting offers for customers is more important than expanding the buildings although she didn’t deny that expanding the size could help to increase its turnover.

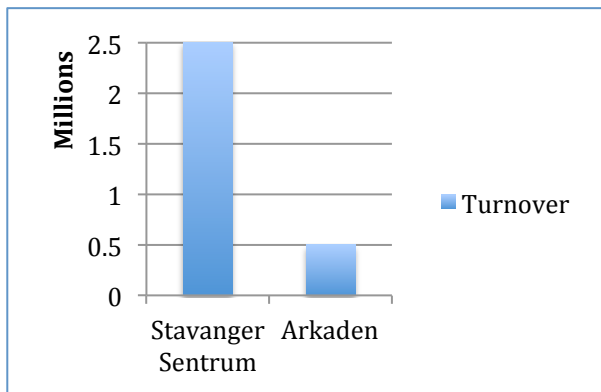


Chart 20 Turnover Stavanger sentum and Arkaden shopping center. Source: Spare-Bank1 2015, Arkaden factsheet 2015.

In terms of the most visited stores, the anchor stores in Arkaden are H&M, Cubus, and Lindex. It is very important to have some popular stores like these, but at the same time, it is also important to present unique stores that people rarely find in the pedestrian street such as Matkroken, Geddon, Mango, Norønna, Fish & Cow, New Yorker, and Wayne’s Coffee. Arkaden shopping center does not provide a big grocery store. The marketing manager said that the shopping center does not have enough space for that. Besides, the shopping center considers the consequences of having a big grocery store in the city center such as traffic and transportation issues. She believes that visitors want to enjoy the city center’s environment without carrying heavy bags from a grocery store.

Arkaden shopping center does not provide a big parking space. In Stavanger sentrum, the shopping centers’ parking threshold is 0,5-0,9 parking spot per 100 m2 BRA. With the total 70 car parking spots, Arkaden’s parking availability is less than the required 155 minimums of car parking spots. However, there is a city center parking hub close to the shopping center that could accommodate around 500 cars. Therefore, Arkaden’s visitors could park their car either at the shopping center or in the parking hub. Nevertheless, the parking limit could encourage people to use alternative modes of transportation other than private cars.

6.1.3 The surrounding area



Figure 6-2 Arkaden neighborhood and the pedestrian street (A)

As shown in Figure 6-2 and Figure 6-3, Stavanger sentrum is a dense area and there is little vacant land around Arkaden. Therefore, the buildings are not as big as other shopping centers in the districts, although the regulation said that Stavanger sentrum could develop its commercial areas without any size limitation. This condition insisted Arkaden to develop gradually and the development itself relied on the surrounding properties available for rent or sale. There are barely mobility barriers for pedestrians around Arkaden shopping center. The road in front of it is small and the speed limit is slow therefore increases safety for the pedestrians. Moreover, some of the shopping center's buildings are located in the pedestrian street area where access for cars is restricted and the overall environment around there is pedestrian friendly.

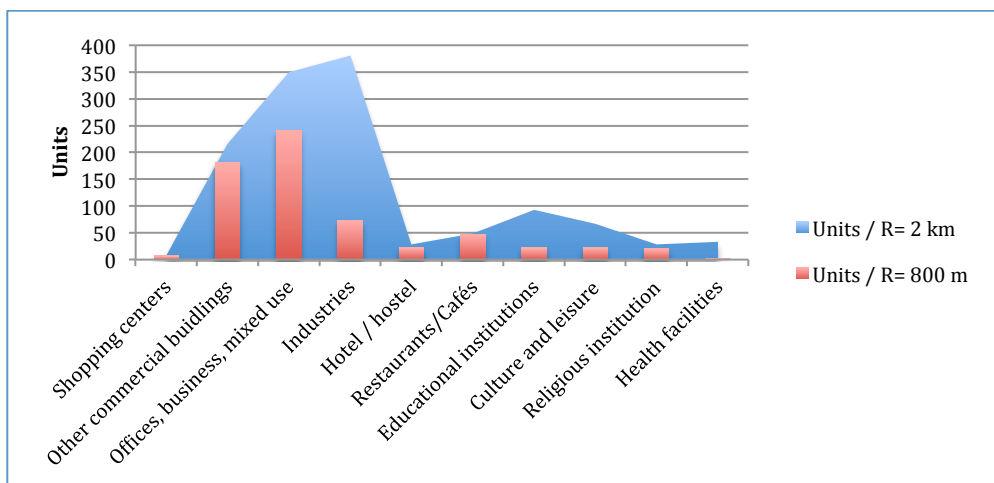


Chart 21 Adjacent buildings, except housing, around Arkaden shopping center in radius 800 m and 2 km. Sources: Norgedigitalt, ArcMap software.

The comparison between buildings' functions is different from radius 800 meter and 2 km as shown in Chart 21. In radius 800 meter, offices, business, mixed use, and other commercial buildings have higher number than industry buildings. Meanwhile, industry buildings surpass those functions after radius 2 km.

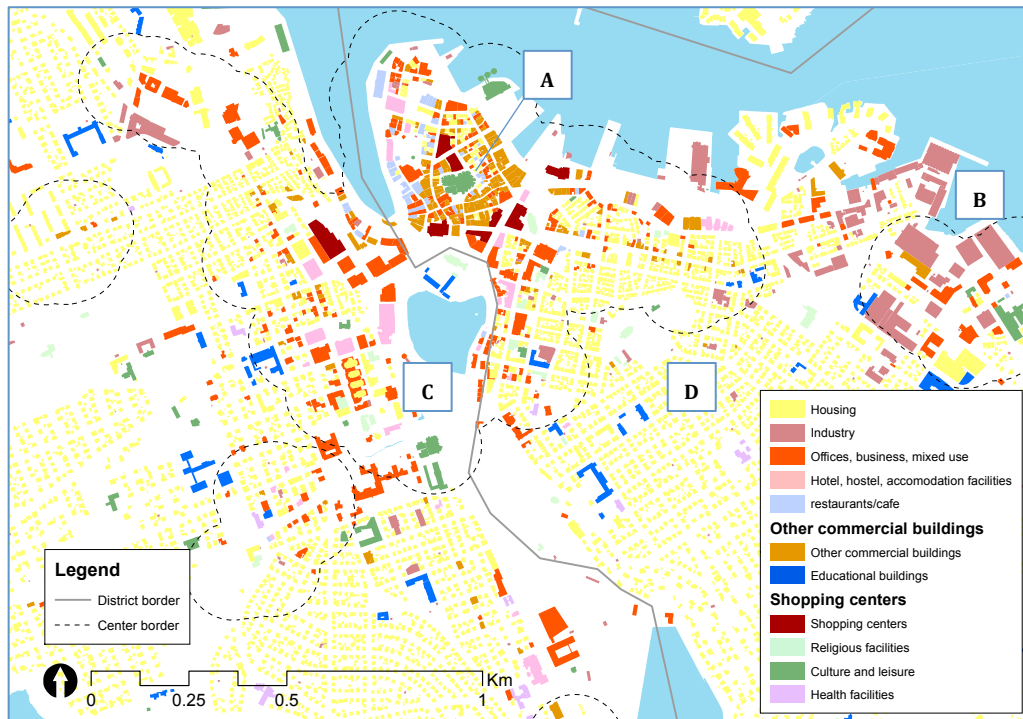


Figure 6-3 Building functions in Stavanger sentrum. Sources: Norgedigitalt, ArcMap software

Photo A in Figure 6-4 is the pedestrian street area. The commercial buildings in that area consist of both local and foreign chain stores. The foreign chain stores often offer cheaper and a broader range of products than the local stores and many people prefer visiting these shops. The foreign shops are important in terms of maintaining a high amount of shoppers in the pedestrian street. Beside shops, the pedestrian street also offers restaurants, cafes, a library, and a movie theater as public spaces.



Figure 6-4 Neighborhoods situation in Stavanger sentrum. Sources: Personal photos, Google maps

The neighborhood is a multifunctional space that holds several activities that keeps the area vibrant. Moreover the various types of functions in Stavanger sentrum are able to increase linked trips, for example a combined shopping and leisure trip thereby saving more energy and reducing the carbon footprints.

Photo B is the industrial area, which has the lowest population. The live in this area is significantly different from the other vibrant neighborhoods in the city center. Moreover there are many big buildings here that are not well maintained.

Photo C shows the lake next to the bus terminal and the railway station. A cathedral beside the lake is a landmark in the city center. This lake is also considered to be the border between the old city center in the northeast and the new city center in the southwest part of Stavanger sentrum. Meanwhile, photo D shows the residential area in Stavanger sentrum. The houses are mostly duplex or small apartments. This area consists of a lot of heritage buildings, and they are all well maintained.

6.1.4 Catchment area

Arkaden shopping center is located on the border of Storhaug and Eiganes/ Våland districts. In total, both districts have approximately 40.000 inhabitants with a density of 2500 people/m². Meanwhile, there are approximately 36.000 people within a radius of 2 km from the shopping center, and 7.400 people within a radius of 800 meter.

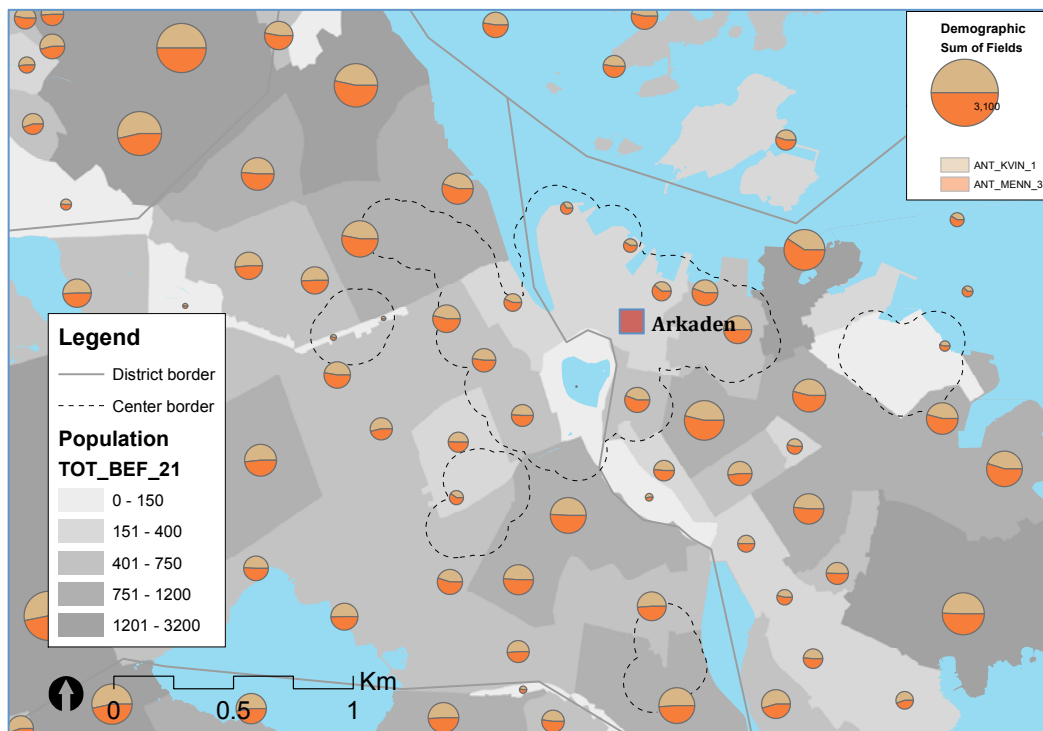


Figure 6-5 Distribution of population in Stavanger sentrum area and the location of Arkaden. Sources: Norgedigitalt, ArcMap software.

Figure 6-5 shows that the population in Stavanger sentrum area is higher on the outskirts of the center. Based on the research map, the highly populated areas in

Stavanger sentrum are located 1-2 km away from the shopping center. The previous study by TØI (2010) said that the average walkability for a city center area is 1-1,5 km. Therefore, it should be possible for people who live just outside the border of the city center to walk to the shopping center.

6.1.5 Accessibility and transportation networks

Based on previous research from SINTEF in 2014, modal share in Stavanger sentrum is 41% by car, 16% by bus, and 43% by walking/bicycle. However, Arkaden’s marketing manager explained that until January 2015, 74% of the customers in Arkaden didn’t use private cars. The modal shares in Arkaden are: 37% by walk, 35% by public transport, 2% by others, and only 26% of them used private cars. The reason for this is because there are many people who live in Stavanger sentrum that walk to the shopping center and the pedestrian street. In addition, people use public transport because it is very accessible.

The average acceptable distance for walking in a city center is farther than the acceptable walking distance in a smaller neighborhood. In a city center, people are willing to walk up to 1,5 km while in a smaller neighborhood, people are willing to walk until 1 km. Based on Figure 6-6, the denser residential areas are located outside of radius 1 km from the shopping center and the pedestrian street. It means that people who live in this area is expected to walk towards the shopping center or the pedestrian street.

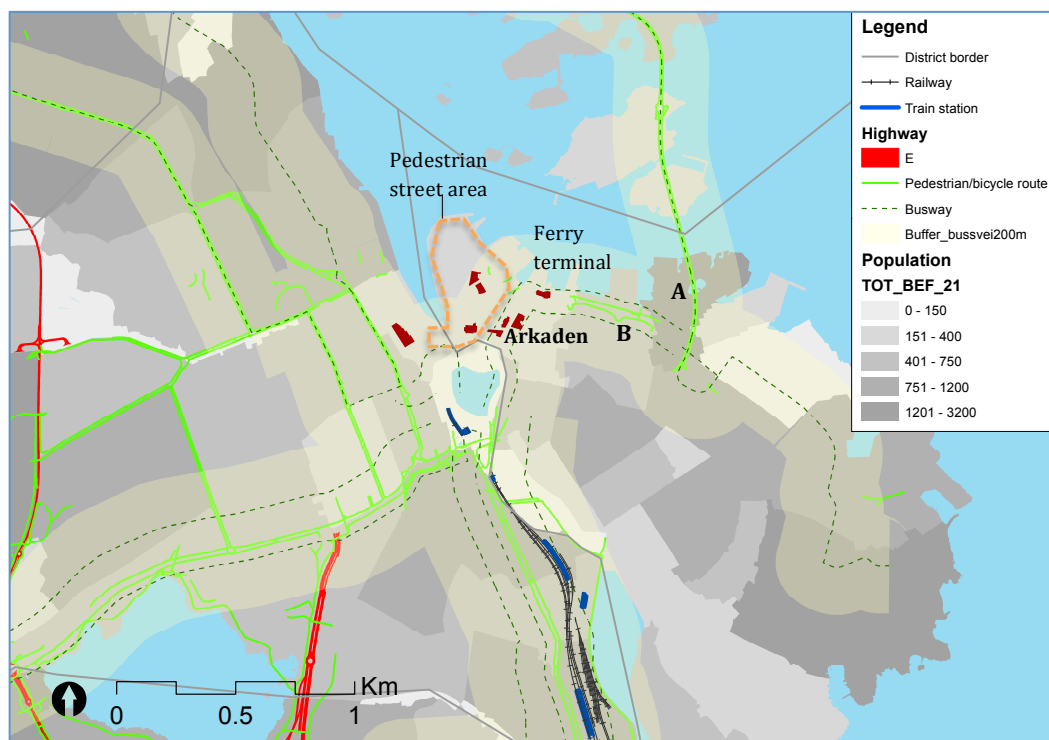


Figure 6-6 Stavanger sentrum population, transportation networks, and busway catchment area (200 m). Sources: Norgedigitalt and ArcMap software

Arkaden shopping center and the pedestrian street are located less than a kilometer from Kolumbus bus terminal and NSB train station. There are also many

bus routes available around and in Stavanger sentrum. The 200 m catchment area of walking distance to bus stops as mentioned by Statens Vegvesen, 2014, shows that this neighborhood particularly the high populated patches has a good accessibility to the bus. In addition, the availability of public transport in Stavanger sentrum is adequate to accommodate visitors who live in various neighborhoods across the city.

The closest high-populated area to the shopping center and the pedestrian street is residential patch area (A). At the same time, the region road (B), which often has heavy traffic, is passing through that patch and this road also connects the area to the pedestrian street. Unfortunately, the heavy traffic along this road makes an uncomfortable walking experience for the pedestrians.

Pedestrian/bicycle path (B) in Figure 6-6 is the registered path in the city that connects a populated area (A) to the shopping center and pedestrian street. Based on the observation, the path is narrow and it adjoins to the massive buildings' wall along it. This condition creates an inconvenient environment for pedestrians who walk to or from the shopping center. To prevent this experience, pedestrians could take alternative routes along the waterfront but this distance is longer.

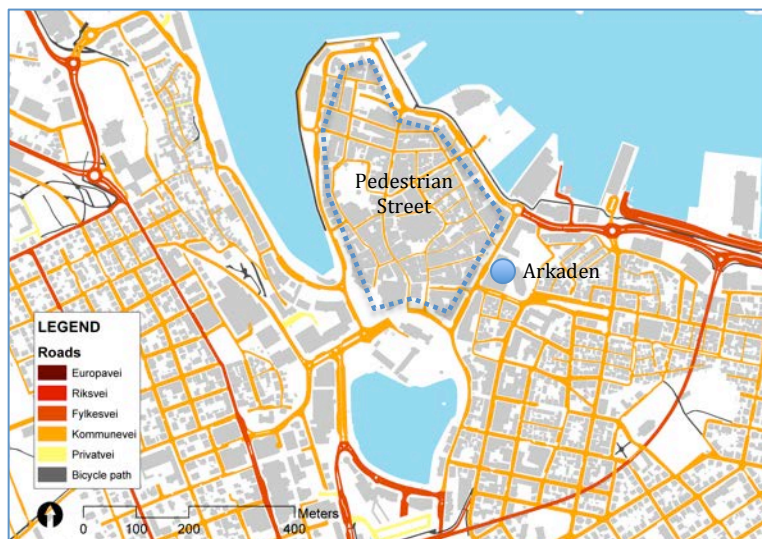


Figure 6-7 Types of roads in Arkaden's neighborhood. Sources: Norgedigitalt, ArcMap

Figure 6-7 demonstrates that Arkaden's neighborhood is not directly connected to major roads such as the highway or the region roads. The roads around it are the 'inner roads' that only connect some locations inside the neighborhood. In the same time, most of pedestrian street roads are restricted for private cars. The condition restrains the private cars therefore the use of other modes of transportation such as public transport and pedestrian are increased.

6.1.6 Future development in relation to neighborhood development

Based on the interview with Arkaden's marketing manager, the possible development for the shopping center is through the offering and collaboration with Stavanger sentrum's organization instead of physical building expansion. The unavailable vacant properties nearby delimit the physical development. By the time

there is an available property, the shopping center will conduct some assessment in order to see if the value of the property meets the target plans. It is important to consider the shopping center's development as the city center's border keeps growing and the need of strong identity is increased.

There are approximately 300 stores that are registered as Stavanger sentrum's organization (STAS) members. The collaboration is carried out in order to establish a positive competition between commercial areas in Stavanger sentrum. At the same time, the members develop a concept for a more attractive city center for shopping and leisure such as programming sales periods, developing art and cuisine activities, etc.

6.2 Madla AMFI, Stavanger

Madla Amfi is located in the district center of Madla. The center's functional area for business and commercial activity is 0.04 km² meanwhile the whole district center spans 0.05 km². This size is much smaller than Stavanger sentrum. Madla has the second most populated area after Stavanger sentrum. The density of the district is 1.500 people per square kilometer. This means the need for shopping centers including grocery stores within the district is higher than the other districts in the city. SINTEF (2012) mentioned that 70% of people prefer to visit a shopping center that is located in the same district as they live in. Therefore, most of the inhabitants in Madla will prefer Madla AMFI as their main shopping destination. The high population in Madla enforces the shopping center to be bigger and be able to provide a wider range of goods and services.

There are two places that are related to the history of Madla district; KNM Harald Hårfagre army camp and "The three swords" in Hafrsfjord, which mark the victory of King Harald in gathering all of Norway under one crown. Madla district has had a strong sense of community. It is not surprising that many houses in Madla are inherited from older generation to the next family generation.

Before it developed into a big shopping center, Madla AMFI used to be Madlahandelslag, which has existed since 1907. The store sold good quality of groceries with good dining facilities so people could buy meals and socializing at the same time. It was a famous meeting place for people in the district. Nevertheless, Madlahandelslag continues to be recognized as a public place until now.

Based on the interview with Madla AMFI's center manager, the shopping center is the biggest district shopping center in Stavanger municipality and has an incremental turnover every year. Therefore, a lot of people who come from other districts prefer to visit the shopping center because it provides more stores than the other district shopping centers. The viability of the shopping center encourages Madla AMFI to be more attractive. In order to achieve that goal, the shopping center attempts to upgrade the shopping center's public facilities such as dining area so the visitors could experience more than just shopping.

The regulation plan said that the shopping center could be developed up to 30.000 m² of *bruksareal*/BRA including sales area, storage, dining area/canteen, and office area. Parking lot is not included in BRA. Until now, Madla AMFI reaches around 26.000

m2 in BRA, so there is a possibility to expand 4.000 m2 more of the shopping center as long as the municipality approves the development permit.

6.2.1 Physical characteristics



Figure 6-8 Madla AMFI's building block and its main entrances

Madla AMFI shopping center, as shown in Figure 6-8, is composed by a single building block. It has a few main entrances and no direct access from the outside to the stores. Only few people use the entrance in the north of the building, as it is located far from the parking areas. Most visitors are using the other two entrances next to the parking lot.

There is no car access along *Fylkesvei 509* or the main road towards the building. This is in order to keep the flow of the traffic without any distraction from the cars that go in/out of the shopping center. Regarding the characteristic, the shopping center's building is introvert. The building's skin disintegrated indoor and outdoor environment so that the activities only focus inside of the building.

In Madla AMFI, the biggest store is a grocery store, Coop Mega. Based on the size, it behaves as an anchor store that draws many visitors to the shopping center. In addition to Coop Mega, other stores that attract many visitors are Vinnmonopolet, Rema, Clas Ohlson, Cubus, Lindex, Kappahl, Apotek 1, and Intersport. Unlike shopping centers in the US, shopping centers in Norway do not have any department stores that act as anchor stores. Normally, the anchor store in shopping centers in Norway is a big grocery store. One of the reasons is the size of the department store does not fit to the regulated size of a district shopping center.

Restaurants and cafes are important facilities in shopping centers because they are convenient public places for the visitors. Madla AMFI's center manager agreed that a restaurant/cafe provides a space for people to meet friends and allows them to take a break during their shopping. Therefore, the shopping center selected tenants that are able to serve high quality meals and contribute to a good environment for the shopping center. So far, there are five restaurants/cafes in Madla AMFI. When the shopping center provides such facilities, visitors tend to spend more time there. The shopping center also expects to have visitors as many

as possible regardless to the amount of their purchase. The center manager believes that 'people draws more people' so the possibility to get a higher turnover is related to the number of visitors in any way. In addition, Madla AMFI is the only shopping center that provides a library. The facility enables people to make greater use of the shopping center.

Madla AMFI expanded its parking area due to the demand for it. According to the center manager, around 80% of visitors to Madla use private cars. Some factors that may trigger the use of private cars are firstly, most of the visitors shop for groceries in Coop Mega and they need convenient transportation to carry the goods they bought. It is very important to provide a parking space as close as possible to the grocery store's entrance. Secondly, the center manager of Madla AMFI believes that upgrading public transportation around the shopping center will decrease the use of private cars. She also added that weather conditions determine types of transportations that the visitors will use.

6.2.2 Facts

Based on the factsheet, Madla AMFI is owned by Forretningsbygg AS. The year of the opening was 1991 as Madlatorget, and the shopping center developed into Madla AMFI in 2007. The shopping center is managed by Amfi Drift AS.

Name of shopping center	: Madla AMFI
Location	: Madla district
Total Area	: 64.000 m ²
BRA	: 26.000 m ²
Number of stores	: 91
Parking (inside and outside)	: 640
Visitor in 2015	: 3.9 million
Turnover in 2016	: 1.33 billion kr

The size of Madla AMFI shopping center is in the category of community shopping center with trade area up to 8 km. Referring to Asplan Viak (2007), the optimum distance for shopping trips is 2 km away from where people live and there are approximately 5100 people within radius 2 km. In addition, there will be fewer people who do the shopping trips from further away than 8 km.

The primary market for Madla AMFI is for people who live in Stavanger municipality. Meanwhile, the secondary market is for those who reside in Randaberg, Sola, Sandnes, and Rennesøy. Apparently, Madla AMFI also targets visitors from a broad area in the region, and the shopping center is expected to have the same trade area as a region center. The large trade area indicates that the shopping center needs to expand and add more stores. At the same time, it is still possible for the shopping center to expand up to 30.000 m² or until it reaches the maximum allowed size.

The center manager said that Madla AMFI has a special focus on women at any age. Therefore, clothing and shoes are the most available retails in Madla AMFI as these retails attract women and families. She also added that other important groups of visitors for Madla AMFI are the district's inhabitants and families.

Madla district is one of the densest residential areas in Stavanger. It will be more economically profitable if the shopping center is able to expand as big as possible and provide more various retails. Unfortunately, there is a size limitation in developing the shopping center. One way to increase turnover is by providing big grocery stores as grocery retail always contributes to the high turnover.

Based on Chart 22, grocery retail is the highest turnover in Madla district. It occurs either because the majority of inhabitants in the district buy groceries there or the district itself does not provide as many various retails as in Stavanger sentrum.

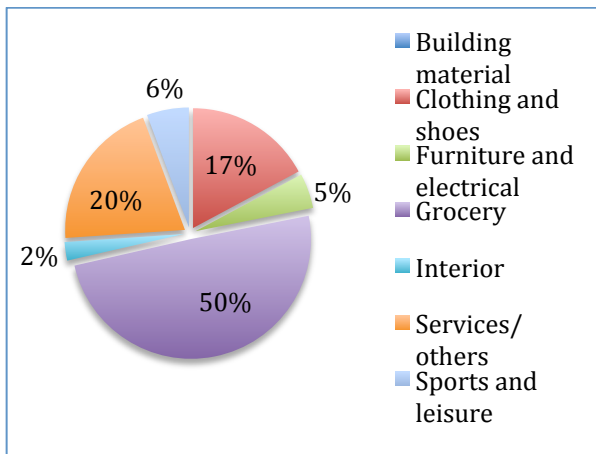


Chart 22 Madla district retail allocation. Source Spare-Bank1 2015.

Apparently, the shopping center plays a major role for the economy of the district. More than half of Madla district’s turnover is contributed from the shopping center (see Chart 23). The district’s turnover value rely on the viability of Madla AMFI, therefore the future development of the shopping center determines the economic growth of the district.

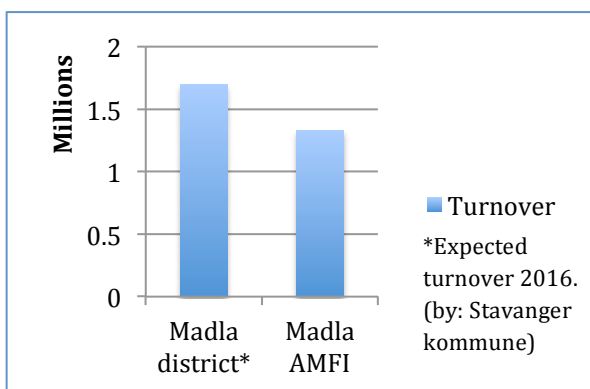


Chart 23 Turnover in Madla district and Madla AMFI. Source: Spare-Bank1 2015 and Madla Amfi factsheet.

Stavanger municipality proposed that parking requirement for a commercial area in a dense neighborhood that has access to good public transport, such as Madla, should range between 0,9-1,2 parking spots per 100m² BRA. As mentioned previously, Madla AMFI is located in a dense area and has access to a busway route. The building has 26.0000 m² BRA, which means the minimum parking should be 225 parking spots and maximum 300 parking spots. But recently, Madla AMFI

expanded its parking up to 600 parking spots for guests. The parking in the shopping center is exceeded than the recommended. However, the parking proposition does not force the shopping center to follow the number.

6.2.3 The surrounding area



Figure 6-9 Madla AMFI and its potential physical barriers

The sizes of the buildings around Madla AMFI are significantly smaller than the building block. A, B, C, and D neighborhoods in Figure 6-9 consists of housing. Stokkavannet or Stokka Lake is located in the north of housing B. It is one of the recreational points in Stavanger and many people visit it for walking/jogging. Meanwhile, E is an army camp in Stavanger, which according to history, was an important function for both Madla district and Stavanger city.

Meanwhile, the main roads that surround the shopping center might impede the connectivity from the neighborhoods across the road to the shopping center. In addition, the massive enclosure wall and the parking area limit the direct mobility for pedestrians while entering the shopping center. Consequently, the shopping center has main orientation towards the south and the area in this part is the most potential to be developed into a pleasant urban space adjoins with the shopping center.

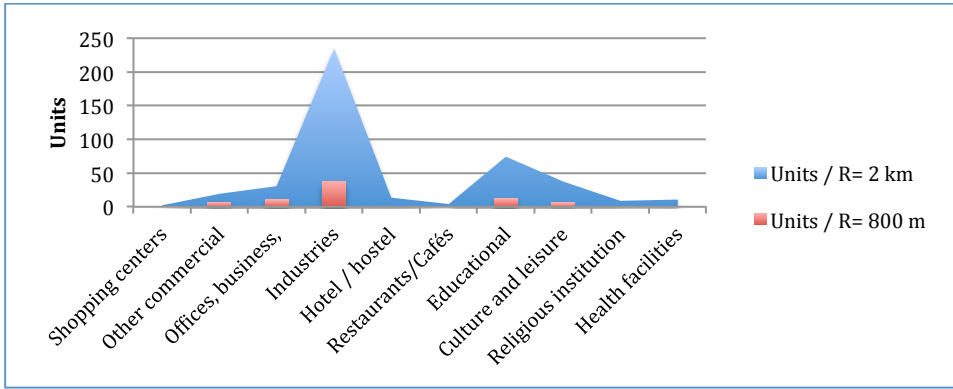


Chart 24 Adjacent buildings, except housing, around Madla AMFI in radius 800 m and 2 km.
Sources: Norgedigitalt, ArcMap software.

Madla AMFI is the only shopping center in Madla and it is located in the district center. The district center itself is surrounded by residential areas. Based on Chart 24, total numbers of industry in radius 2 km in Madla comes second after housing, followed by offices, business, and mixed use buildings. Within radius 800 m from the district center, there is only one health facility, a religious institution, a restaurant/cafe area, a hotel, and a shopping center (see Appendix 6).

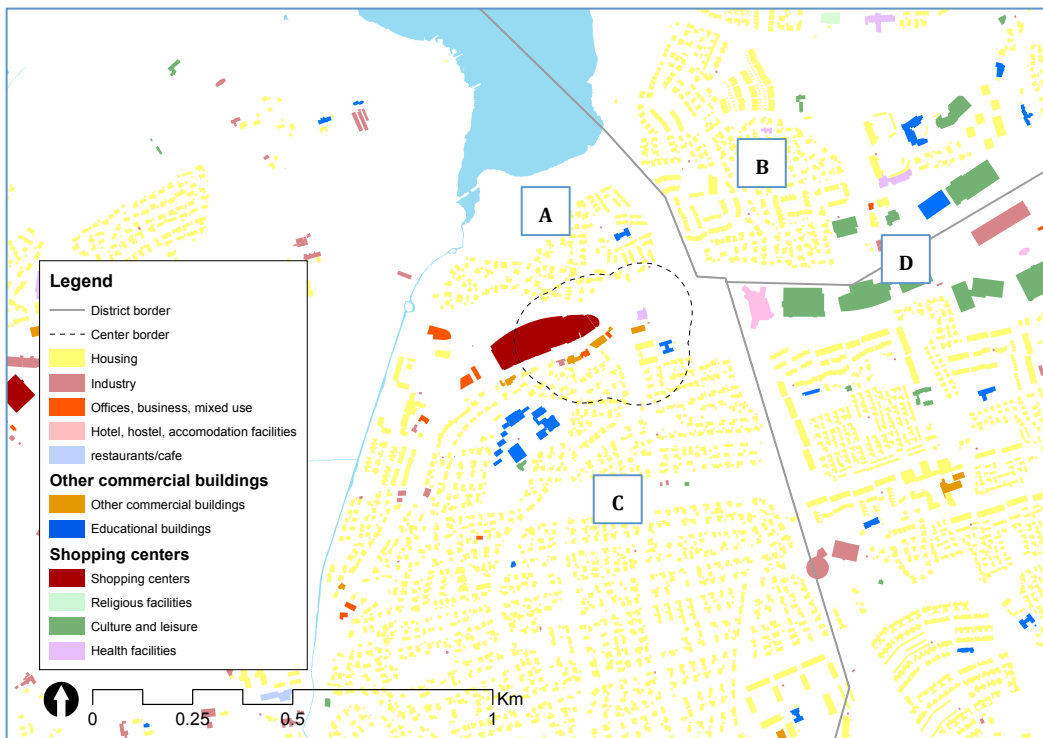


Figure 6-10 Building functions around Madla AMFI. Sources: Norgedigitalt, ArcMap software



Figure 6-11 Neighborhood situation around Madla AMFI. Sources: Personal photos, Google maps.

Unlike Arkaden shopping center’s neighborhood, Madla AMFI is surrounded by residential areas. The neighborhood is not as mixed use as Stavanger sentrum. There are only a few small commercial areas and health services in addition to the shopping center. However, Madla AMFI tries to mimic the commercial function of the city center. It provides several shops, and some public spaces such as library and restaurants/cafes but only in an indoor building instead of pedestrian street. A, B, and C in Figure 6-11 are neighborhoods with different housing types. They are respectively student dormitories, terraced houses, and detached houses. Meanwhile, neighborhood D consists of sport halls.

6.2.4 Catchment area

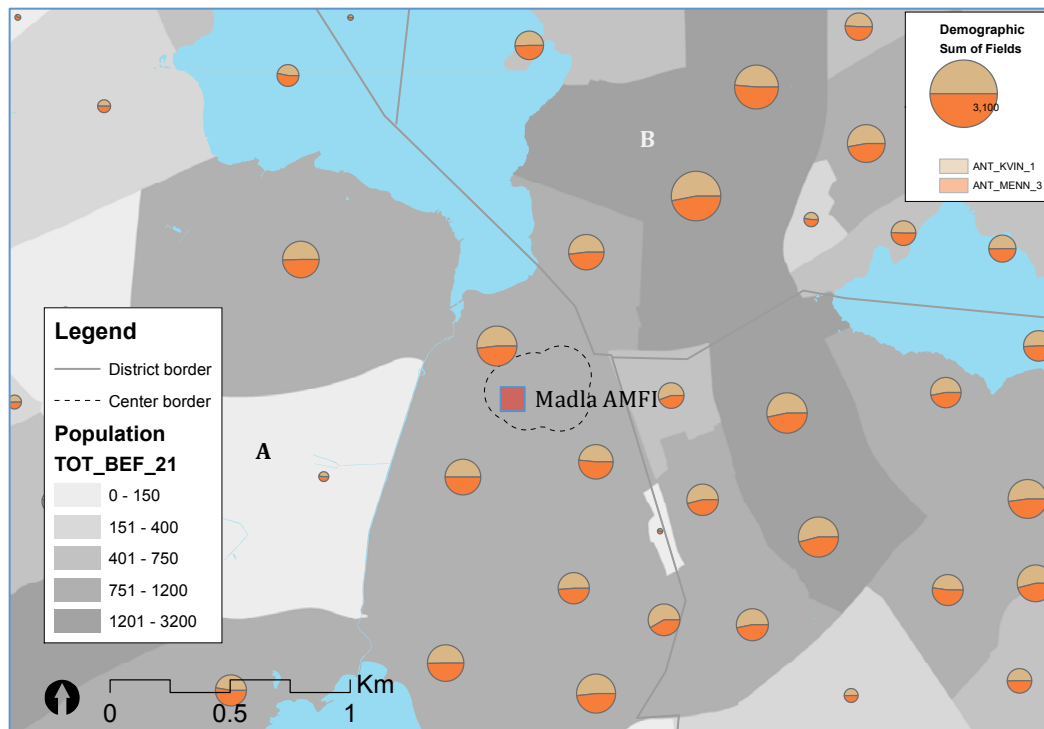


Figure 6-12 Distribution of population around Madla AMFI. Sources: Norgedigitalt, ArcMap software

Compared to Stavanger sentrum, the population within 2 km from Madla AMFI shopping center is lower. There are approximately 21.000 people within a radius of 2 km from the shopping center, and 4.800 people within a radius of 800 meter. But compared to other districts, the population around Madla AMFI is the highest although from Figure 6-12, the highest population (B) is situated in the different district.

The eastern part of the shopping center, which is located in Hillevåg and Eiganes/Våland district, has higher population than in the west. Revheim (A) in Figure 6-12 is a low density neighborhood in Madla district because it is an agricultural area. However, the city is going to develop Revheim into a new urban settlement with 4000 housings, commercial buildings, mixed-use, and other building functions. Certainly, there will be a neighborhood center as well. Based on the interview with the center manager, it was too early to predict that the future commercial area in Revheim's neighborhood center will be the main competitor for Madla AMFI. She added that the adjacency with Reveim might not threat Madla AMFI in terms of gaining visitors and turnover. Besides, the type and size of the commercial area in Revheim will be different than the shopping center as Revheim is regulated as a smaller local center.

6.2.5 Accessibility and transportation networks (public transport must be available)

SINTEF (2014) mentioned that the average proportion of shopping trips by private cars is 70% while public transport and walk are around 28%. In the same time, Madla AMFI's center manager explained that 80% of visitors in the shopping center use cars and 20% of them use public transport and walk. This means that the private car use to this shopping center is higher than the average.

Based on Figure 6-13, Madla AMFI is not directly connected to the highway nor the railway. The main connection is *fylkesvei* 509 or the region road that connects the west and east parts of the city. This road is often busy during rush hours because it is the only main road that connects west part of the city (Stavanger sentrum area) and east part of the city (Tananger area). The busway runs on *fylkesvei* 509 it has its own lane but at some points, it merges with regular lanes and blends with normal busy traffic.

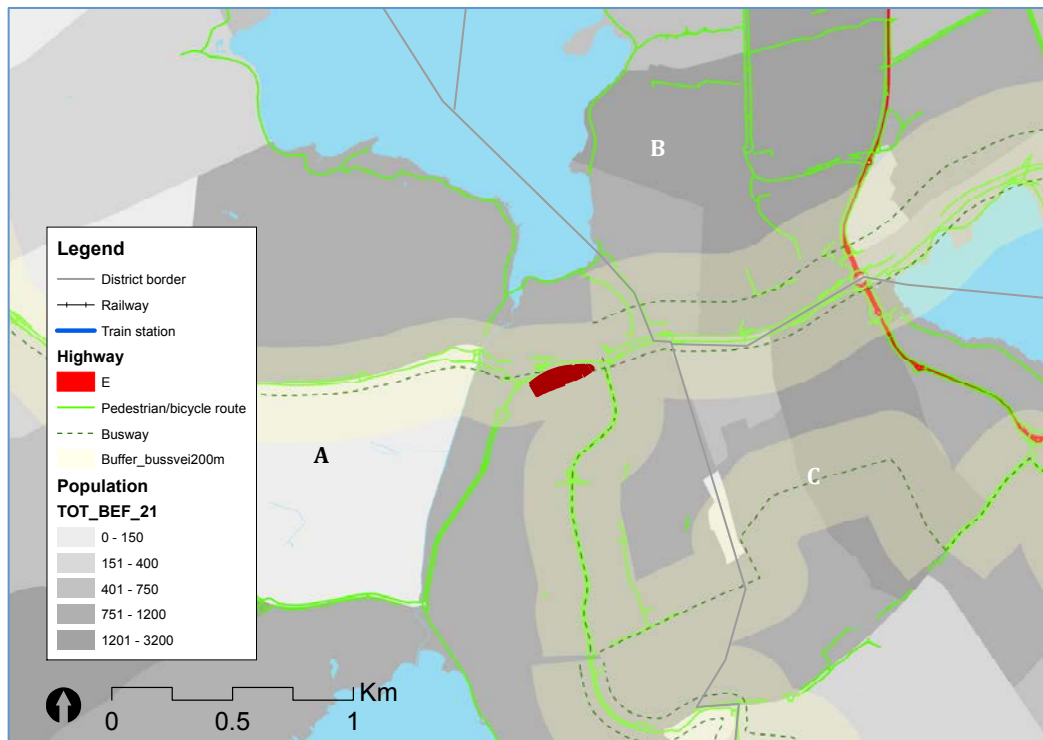


Figure 6-13 Madla district's population and transportation networks. Sources: Norgedigitalt, ArcMap software

There are integrated pedestrian/bicycle lanes along *fylkesvei* 509. The paths are safe because they have a separator as well as ample distance from the edge of the road. Therefore, walking/cycling along these pedestrian lanes is a great alternative in terms of safety and time during rush hour. As shown in Figure 6-13, both the high populated area (B) and future Revheim settlement (A) has a good pedestrian connection to Madla AMFI.

All bus routes in this neighborhood cover a good 200 meters from the bus stops. The bus route (C) even goes thoroughly into the neighborhood in order to serve people in that area. In the meantime, the distance between bus stops in Stavanger are between 600-800 meters, therefore 200-400 meters is the acceptable walking distance to the bus stop (Berge, 2012).



Figure 6-14 Types of roads in Madla AMFI's neighborhood. Sources: Norgedigitalt, ArcMap

Figure 6-14 shows that the major road in the north of the shopping center gives an easy access for people who use private cars. The road is one of the most important connector that links the west and east parts of the region. In the same time, the neighborhood provides a good accessibility for pedestrian and bicycle.

6.2.6 Future development in relation to neighborhood development

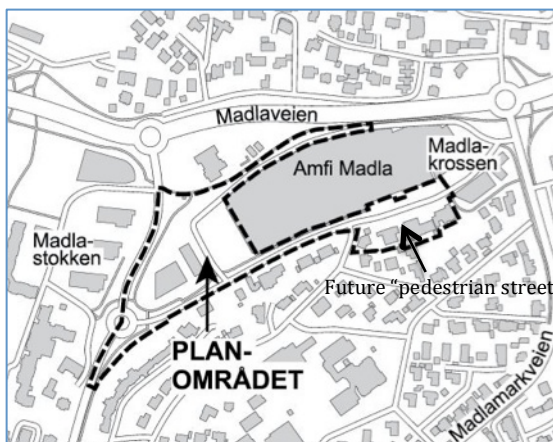


Figure 6-15 Madla AMFI development plan. Source: Alliance Arkitekter

Based on the interview with the center manager, the plan for Madla AMFI is to expand the building until approximately 4000 m² or until the maximum of the allowed size. The housing units and a mixed-use function will be developed in the shopping center's area. This strategy corresponds with the city plan in achieving a more mixed and denser center area. Furthermore, she explained that there might be a "pedestrian street" in the southern part of the building. The idea to adopt the city center's environment is to create a unique shopping center that has never been offered by other shopping centers in Stavanger. At the same time, the shopping center should consider the consequences of the development plan such as the increased traffic and the demand for more parking spaces. However, the

development plan for Madla AMFI has not been submitted to the municipality so there hasn't been any decision on when the project will be commenced.

6.3 Kvadrat, Sandnes

Kvadrat is located in Lura district, Sandnes. It is situated 3.5 km away from Sandnes city center and 12 km away from Stavanger sentrum (see Figure 6-16). Lura district is one of the districts inside Forus business and commercial district in the Stavanger region. Forus is a regional and national growth engine that expands 6,5 km². Geographically speaking, Forus is situated in the center of the region and it is expected to be the main hub for business-industry in the region. The area stretches across 3 municipalities; Stavanger, Sola, and Sandnes. Approximately 40.000 people work in Forus and one-fifth of the value creation in the region happens there. Currently, the number of industries available in Forus surpasses the total number of industries in Stavanger and Sandnes city centers and many companies across the region had moved in to Forus. This office and industry hub attracts many workers both from locally and abroad and therefore, urbanization in the region has become inevitable. In addition, most of the workers in Forus reside outside of the neighborhood and they use private cars to get to work. In consequence, the traffic around the neighborhood during rush hour is extremely busy.

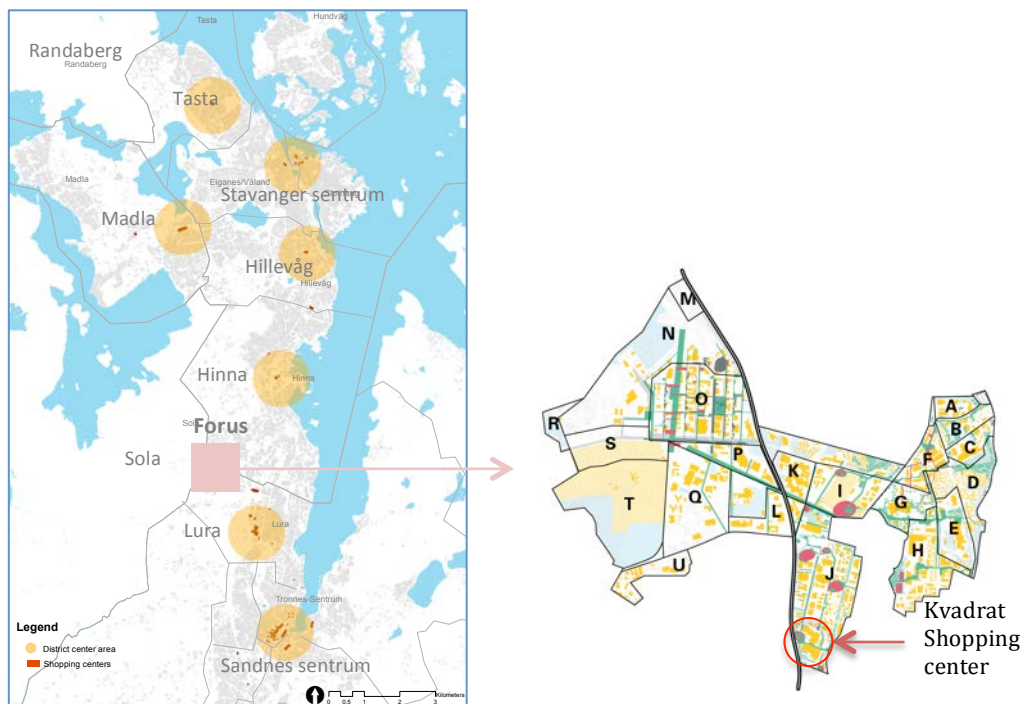


Figure 6-16 Forus map. Sources: Norgedigitalt, Forusvisjonen.no

Forus neighborhood is a car-based area with big building blocks and plenty of parking lots. Its homogeneity function and dominating man made infrastructure makes the Forus area, including the Kvadrat neighborhood, less attractive during non-working hours and in the weekend. The city planning department is still struggling to find the

best solution for the traffic situation along Forus. One of the attempts is to establish a busway route that goes into the neighborhood.

Kvadrat shopping center developed in the early 1980's. The shopping center used to be an industrial building for steel casting. Until 2012, Kvadrat was the fourth biggest shopping center in Norway in terms of turnover and size. After that, the position became surpassed by Sørlandsenteret in Kristiansand and AMFI Moa in Ålesund. The shopping center experienced a decreased turnover in 2015 due to an expansion project that temporarily removed some functions. However, in the late of 2016, Kvadrat completed the development project and opened 19 new stores, making the current total number of stores 172. It added 16.000 m² more from the total size but the parking area didn't expand yet the shopping center is still able to accommodate parking for 2500 cars.

6.3.1 Physical characteristics



Figure 6-17 Kvadrat shopping center aerial view.

Kvadrat shopping center as shown in Figure 6-17, is composed by two building blocks (A and B) that are connected with a bridge (C). It is surrounded by huge parking spaces, which can accommodate around 2000 cars. Kvadrat is a car-based shopping destination and the surrounding environment is not pedestrian friendly. The big parking space and road conditions discourage people to walk to the shopping center.

A grocery store, Coop Obs, was the biggest store in Kvadrat shopping center. But recently, Kvadrat added another big grocery store, Helgø Meny, therefore the shopping center has 2 big grocery stores that are able to boost the shopping center's turnover. In term of size, the clothing store H&M follows after the grocery stores. The clothing and shoes stores dominate in Kvadrat and are subsequently followed by interior and home appliances stores. Most of the restaurants/cafes are placed in one area, sharing a common food court. This area works as a public space for visitors during their shopping.

Based on research observation, the parking areas in Kvadrat are always busy during the weekend. This means that almost 2500 cars travel to the shopping center at that time. The huge amount of car trips to Kvadrat is facilitated by some factors that include easy access from the highway. In addition, Kvadrat is located in a rural and low density area therefore most of the visitors coming from the city prefer to use cars because it is the most convenient transportation mode.

6.3.2 Facts

Kvadrat is owned by Storebrand Livsforsikring AS and managed by Amfi Drift AS. The year of opening was in 1984 and the most recent development was carried out in 2016.

Name of shopping center	: Kvadrat
Location	: Forus-Lura district
Total Area	: 105.000 m ²
BRA	: 52.000 m ²
Number of stores	: 160
Parking	: 2000
Visitor in 2015	: 4 million
Turnover in 2016	: 2.3 billion kr

The size of Kvadrat shopping center places it in the category of a regional shopping center with a trade area of 16-19 km. These distances reach approximately 8 municipalities: Randaberg, Rennesøy, Stavanger, Sola, Sandnes, Klepp, Time, and Ålgård. However, Asplan Viak (2007) explained that very few people would be willing to do the shopping trips 19 km away from home. On average, fewer people will do their shopping trips if the distance is 2 km or more. It continues to decrease until the distance reach 9 km. But from 9km-15km distances, the numbers of shopping trips remain stable, and after that most of the people will be reluctant to do the shopping trips.

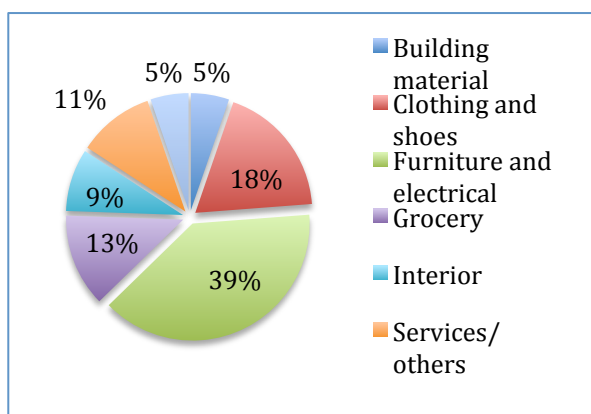


Chart 25 Lura district's retail allocation. Source: Spare-Bank1 2015

Based on Chart 25, the proportion of furniture/electrical retails in Lura district is the highest, followed by clothing and shoes retails and groceries. In Lura, there are many stores that sell furniture and electronics. The stores' buildings are big and require large spaces for logistics and storage. Therefore, these stores are often located in rural and low density areas such as Lura where many vacant land areas

are available for development. In addition, Lura is located close to Stavanger so the proximity is able to attract many visitors from that area. Kvadrat is the only shopping center in Lura that sells fashion/clothing and shoes. The clothing and shoe retailers' proportion on Chart 25 is mostly contributed from Kvadrat shopping center.

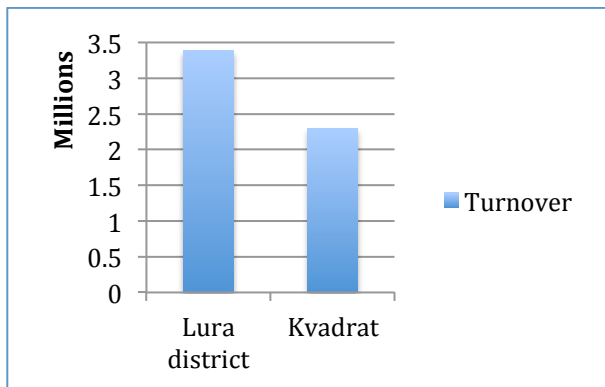


Chart 26 Turnover in Lura district and Kvadrat. Source: Spare-Bank1 2015 and Kvadrat factsheet.

Chart 26 shows that Kvadrat contributes to $\frac{3}{4}$ of Lura district's turnover. The proportion shows that Kvadrat is an important commercial engine for Lura, as well as Sandnes.

Most of Kvadrat's tenant stores sell fashion/clothing and shoes. This means Kvadrat contributes to a big amount of clothing and shoes retail for the district's turnover. Apparently, more than half of the district's turnover comes from Kvadrat.

In Forus-Lura, the regulation said that parking area for a shopping center where more than 60% of the visitors use a private car there should be 2,9 parking spots per 100 m² BRA. That means Kvadrat shopping center should not have more than 1500 parking spots. Similar like Madla AMFI, the parking in the shopping center is exceeded than the recommended. However, the parking proposition does not force the shopping center to follow the number.

6.3.3 The surrounding area



Figure 6-18 Kvadrat shopping center and the potential physical barriers

Lura district center, as shown in Figure 6-18, is located approximately 400 m away from the shopping center. It has only 8000 m² functional area of commercial out of 0,1 km² center area. Unlike the two previous district centers, Lura district center does not serve a variety functions. The commercial buildings in the center are only represented by two grocery stores. Kvadrat shopping center has diverted commercial activities that are supposed to be available in Lura district center.

Compared to the previous shopping centers, Kvadrat has the highest impediment that disrupt connectivity with the surrounding area. The big parking lot creates a gap and the enclosed building walls separate the shopping center with the outside environment. Since the west area of the shopping center is an empty land, the highway in between those areas might not become an obstruction as there are barely mobility across them. In the other hand, the road on the east might become an obstruction if it does not able to serve good environment for pedestrian such as pedestrian path, crossing area, and traffic calming.

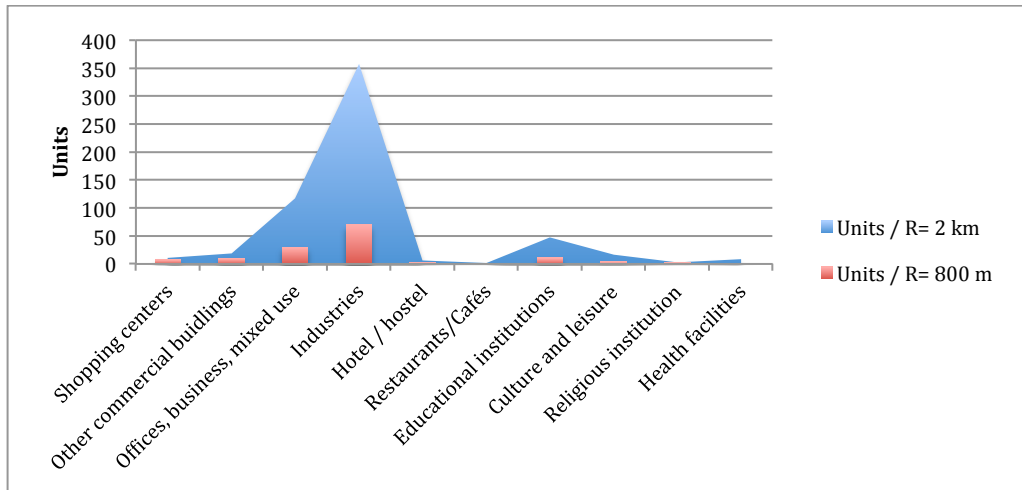


Chart 27 Adjacent buildings, except housing, around Kvadrat shopping center in radius 800 m and 2 km. Source: Norgedigitalt, ArcMap software.

Besides housing, industry buildings are predominant around Kvadrat considering that the location of the shopping center is in Forus business and industry hub as shown in Chart 27 and Chart 28. The number of industry buildings is nearly the same as in Arkaden’s neighborhood.

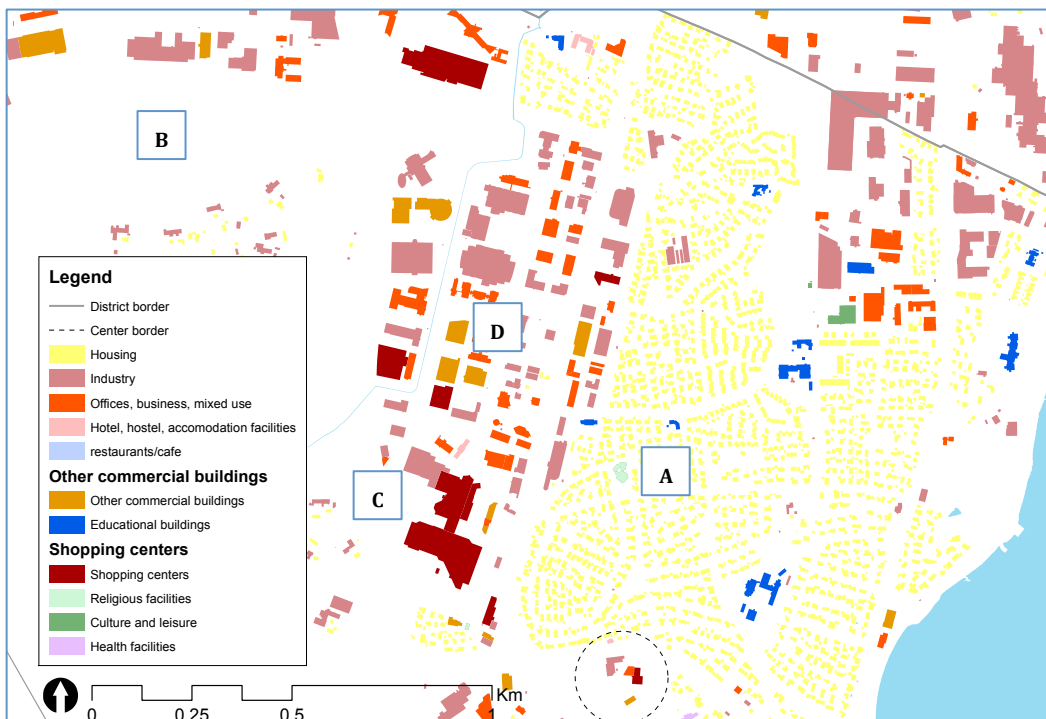


Figure 6-19 Building functions around Kvadrat. Sources: Norgedigitalt, ArcMap software.



Figure 6-20 Neighborhood situation around Kvadrat. Sources: personal photos, Google maps.

Neighborhood A in Figure 6-20 is the closest residential area to Kvadrat. Most of the houses are detached buildings. Meanwhile, C is the highway that separates Kvadrat and the green structure (B). The buildings' typology around Kvadrat as shown in photo D are similar. Most of them appear as massive boxes with big parking places in front of them.

6.3.4 Catchment area

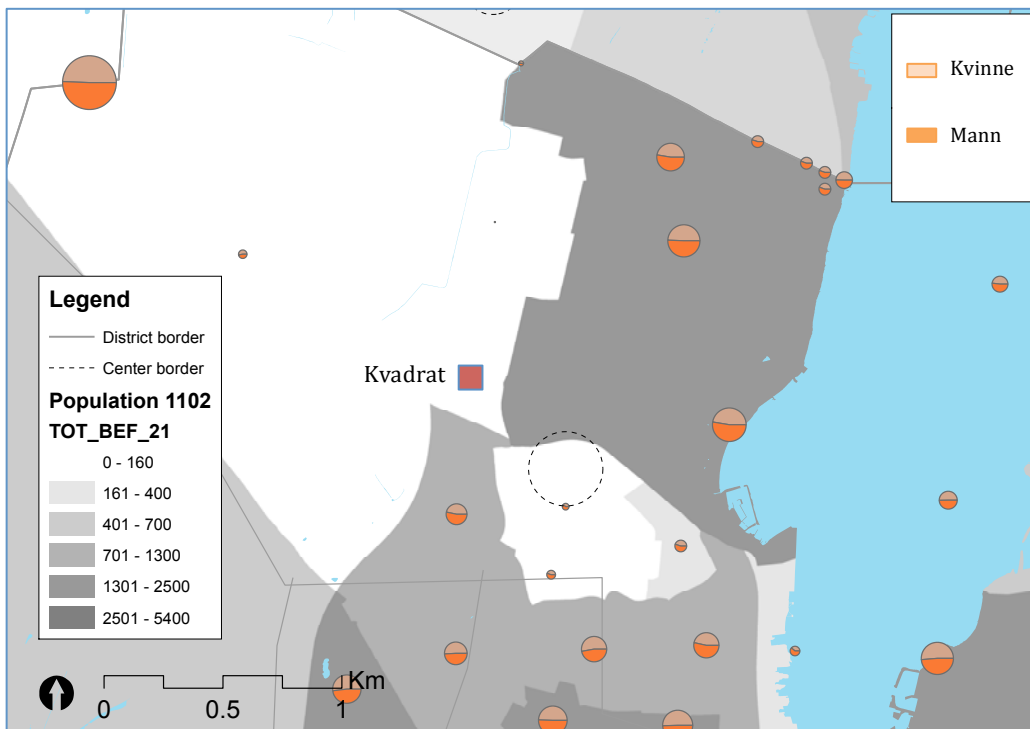


Figure 6-21 Distribution of population in Kvadrat's area and the center's border

The population around Kvadrat is the lowest compared the other previously mentioned shopping centers as shown in Figure 6-21. There are approximately 14.000 people within radius 2 km from the shopping center, and 2.600 people

within radius 800 meter. The density to the east and west side of the shopping center are significantly different. To the west, there are agricultural lands with the lowest population. The highway that stretches along the north and south axis divides the shopping center from the agricultural area. Meanwhile on the east side, there is a populated residential area. The Rv44 road that also stretches along a north south axis divides this residential area from the shopping center.

6.3.5 Accessibility

Based on SINTEF (2012), 91% of the visitors use private cars to Kvadrat shopping center. 6% are pedestrians and only 3% of visitors use public transportation. The highway next to Kvadrat provides easy access for visitors using cars to the shopping center. In addition, the highway circumstantially encourages people to use private cars. It is also very practical to use private cars to the shopping center as it helps the visitors in transporting all the goods they bought.

The shopping center is close to the industries and offices area in Forus. The close proximity makes it convenient for people working in Forus to visit Kvadrat for shopping as part of their commuting or work trips.

There is a busway plan that goes to Forus and the shopping center area. Some busway stops are placed as close as possible to the shopping center so that it could be the primary alternative to private cars. However, Forus and Lura are composed by massive infrastructures such as big roads and parking lots. The density is low and the neighborhood is secluded from urban areas in the region. These conditions has lead to a robust car-based neighborhood and therefore, it is still questionable whether the busway in this neighborhood will significantly reduce the private cars use.

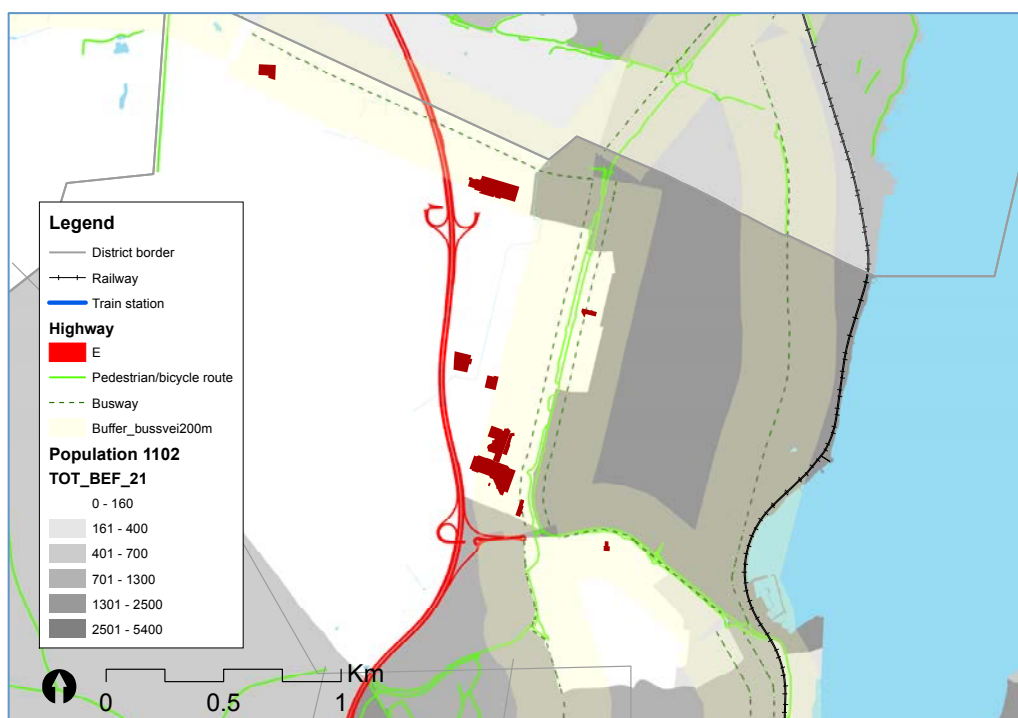


Figure 6-22 Lura district population and transportation infrastructure

A highway (E39) and railway are the main infrastructures in Kvadrat's neighborhood. The highway provides the easiest connection for visitors to reach Kvadrat. Meanwhile, the railway is located approximately 1,5 km away from Kvadrat as shown in Figure 6-22. Unfortunately, there is no train stop nearby Kvadrat or even near the residential area (A) next to Kvadrat. The busway route is available nearby Kvadrat. Some bus stops are located within 200 meter from the shopping center.

The massive infrastructures in Kvadrat area discourage pedestrians to walk or use bicycle to the shopping center. Moreover, the roads on both sides of the shopping center may hinder the connectivity from the residential area next to it.

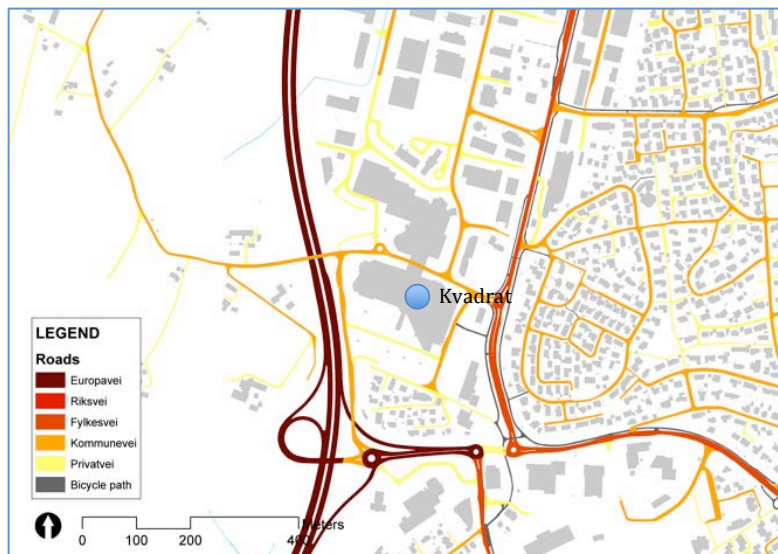


Figure 6-23 Types of roads in Kvadrat's neighborhood. Sources: Norgedigitalt, ArcMap

Figure 6-23 demonstrates that Kvadrat has two major roads in the east and west side of the shopping center. They provide a high accessibility for many modes of transportation especially for private cars. The *Europavei* or the highway connects the north and south of the region and is mainly used for commuting to workplaces. However, this neighborhood provides fewer bicycle paths than in Madla AMFI's neighborhood.

6.3.6 Future development in relation to neighborhood development

In November 2016, Kvadrat completed the development project and opened 19 new stores so the current total number of stores is 172 as shown in Figure 6-24. It added 16.000 m² more from the total size but the parking area didn't expand yet is still able to accommodate 2500 cars parking. Based on Aftenbladet (2012), Kvadrat's development plan was approved by Sandnes municipality in 2012. The manager at that time was convinced that the shopping center needed to expand in order to address the population growth in the future. The municipality agreed and believed that the expansion corresponded with the regulations of developing a commercial area in Sandnes.



Figure 6-24 New development area (in red) of Kvadrat shopping center. Source: skycrapercity.no

As mentioned in the previous chapter, Kvadrat shopping center is situated in the south of Forus. This area spans from Ikea in the north to Kvadrat in the south. Some parts of Forus south will be developed into housing. The development plan by *Forusvisjonen* also includes creating a green corridor along the Fv44 road, small parks, and access for pedestrians/bicycles.

Based on *Aftenbladet* (2013), Forus will have an additional 60.000 inhabitants and about 100.000 employments within the next 20 years. However, most of the residential area will be developed in the east of Forus, which is located approximately 3 km from Kvadrat shopping center.

7 SHOPPING CENTERS AND A CITY

This chapter presents further analysis and findings from the previous chapter. The discussion in this part mostly relies on the three shopping centers that are selected based on their significant distinctions such as locations, sizes and types. The research provides an understanding of factors that are able to integrate shopping centers and the neighborhoods, as well as showing a relation between the shopping centers and sustainable transportation.

7.1 Shopping centers and the neighborhoods

Shopping centers in Stavanger region are distributed in various locations. Each different context demonstrates a unique interplay between shopping centers and the neighborhoods. The distinctive attributes of a shopping center in a city center, district center, and rural area shows that location is an important parameter that helps to define the development strategy for the shopping centers. This parameter tends to establish integration with the neighborhood as well as to promote sustainability. Regardless of the locations, all of the shopping centers would like to have a wide trade area so that they are able to obtain a high amount of visitors and turnover. Therefore, in a matter of business, the shopping centers are focusing on large area instead of just the surrounding neighborhood or the district area. In addition, a shopping center with its high turnover is viewed as a potential catalyst for the district's economic viability in which eventually contributes to the economic development of the city.

The development of the shopping centers in Stavanger region tend to be more vigorous in the low density areas rather than in a city center. The vacant lands in the low density areas encourage the growth of new shopping centers. Besides, the condition allows the shopping centers to be developed bigger. Meanwhile, the limited spaces in the city center restrain the physical development of the shopping center. However, most of the shopping centers in Stavanger region have a typical characteristic as an introvert building, which turn the activities inward. To some extent, this characteristic does not always disintegrate the shopping centers with the surrounding area. Arkaden in the city center is able to embrace the outside environment due to its buildings' configuration and therefore the shopping center's neighborhood becomes vibrant. On the other hand, Kvadrat has a massive enclosed wall and outdoor parking facility that hinder the interaction with the vicinity. Akaden shopping center is also very interdependent with the adjacent pedestrian street and they perform as one unit commercial area in the city center. The adjacent commercial areas and mixed use also contributes to a positive competition for the shopping center. But in some particular places where a shopping center is isolated with other commercial areas for example in the case of Madla AMFI and Kvadrat, they will perform as the independent and introvert commercial building in their neighborhood. In other words, the ability to provide direct access for pedestrians and to establish relation with the adjacent buildings are some of the keys to achieve a lively shopping center's neighborhood.

To some extent, the development of the shopping centers contributes to the neighborhoods' regeneration. The shopping centers create employments especially from

the big shopping centers. The development is also helps to improve the infrastructures in the surrounding area such as new busway links, access to highway, and better pedestrian paths in which eventually increase the accessibility for the city. Moreover, the shopping centers encourage the development of the district center such as increasing density therefore helps to achieve a robust social life.

However, the development of a shopping center is either relies on the regulation or the condition of the neighborhood itself. Arkaden is located in the city center that has high population. The neighborhood is very dense and there are barely vacant properties therefore the shopping center's size is restrained. Madla AMFI is located in the district center with fewer populations than the city center while Kvadrat is located in the edge of the city with fewest populations than the two shopping centers. Both Madla AMFI and Kvadrat should follow the specific size limitation therefore the regulation itself restricts the development of the shopping centers (see Chart 28).

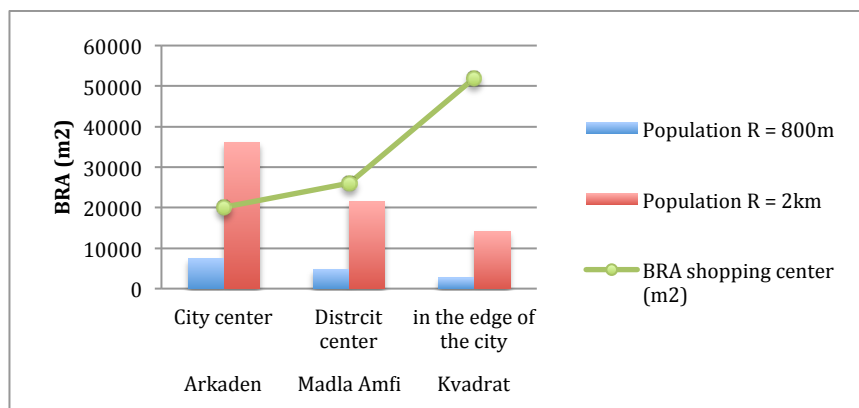


Chart 28 Shopping centers, population, and building sizes

The city regulation explained that the center in a neighborhood should consist of many building functions such as commercial, mixed use, business and offices, and housing. Congruent to that, the development of commercial areas including shopping centers should be concentrated in the center area. The rich and multipurpose centers helps to enhance the livability of the neighborhood. However, not all centers have developed in corresponds with that stipulation. For example, district center in Lura is still underdeveloped and does not have any densification plan in the surrounding area. The condition occurs partly due to its inability to compete Forus, the adjacent business, and commercial and industry area.

The shopping centers are able to foster social engagement. Restaurants, cafes, and library are some of the important public facilities in the shopping centers that are able to attract more visitors and have them to stay longer. All of the shopping centers have restaurants/cafes and even Madla AMFI provides a library. The availability of these facilities enables visitors in the shopping centers to make greater use of it.

The turnover value of the shopping centers is not always depends on the number of visitors. It is rather relying in the offering and location. Kvadrat and Madla AMFI shopping center has a great offering in terms of number of stores and size. The shopping centers lead the visitors to focus on shopping so it makes the turnover high. In the other hand, Arkaden's and the pedestrian street share the same type of visitors who wish to enjoy the city center's environment over shopping. As a result, it has lower turnover

while the number of visitors surpasses Kvadrat shopping centers. In addition, Table 9 shows the relation between turnover and the centers' condition. It demonstrates that the high livability of the centers only contributes to a small degree of turnover value as opposed to the visitors.

Table 9 Centers conditions, visitor, and turnover. Source: the shopping centers' factsheet.

Shopping centers	Centers condition	Visitors (million/year)	Turnover (billion/year)
Arkaden	Mixed and dense	4.5	0.5
Madla AMFI	High populated area with few types of functions	3.9	1.33
Kvadrat	Low population with various types of functions	4	2.3

7.2 The shopping centers and sustainable transportation

One way to achieve sustainable transportation is by reducing carbon footprints that come from vehicular transportations particularly private cars. In addition, minimizing travel distance and total number of trips could also help to decrease the carbon footprints.

So far, private cars are the most preferred transportation modes for shopping trips. It happens because using a car is very convenient and it helps people in transporting their goods, especially from a grocery store. To some extent, this research believed that the big grocery stores in the shopping centers might contribute to the high number of the private cars use. In addition, private cars use is also triggered by the available car-based infrastructures to the shopping centers such as highways and parking facilities, and the inadequate public transport system.

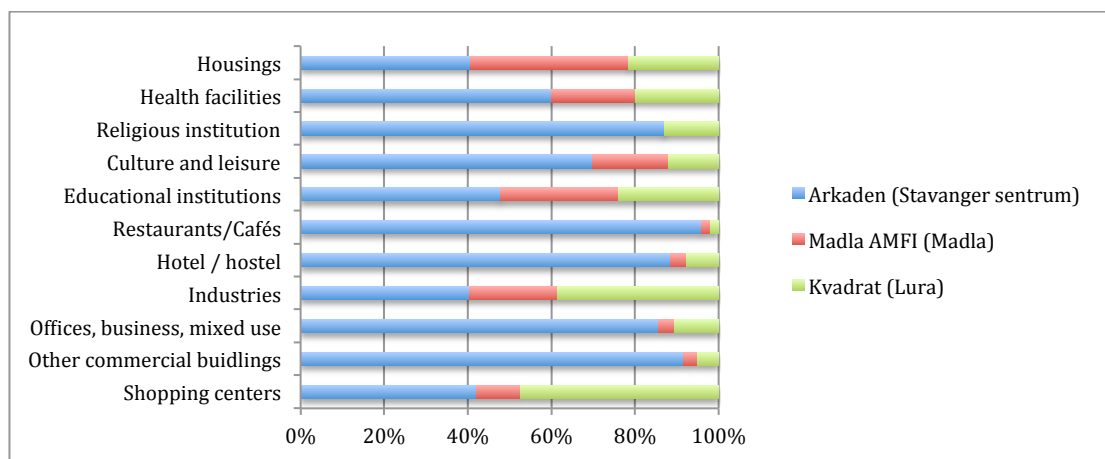


Chart 30 Buildings around the shopping centers in radius 800 m.

Referred to Chart 30 and Table 10, the combination of location, density, and the diverse building functions contributes to the various proportion of the modal share. The numbers of private cars use increase while the public transport use and number of pedestrians falls as the shopping centers become farther from Stavanger city center. In addition to location, the infrastructures conditions also give impact to the transportation choices. Based on the research observation, Madla AMFI is situated next

to the major road that connects west and east part of the region. In the same time, Kvadrat has an easy access from the highway alongside the shopping center. The highway is the busiest road that connects the north and south of the region and is mainly used for daily commutes. Both of the shopping centers have a large amount of private cars use. In the other hand, Arkaden's neighborhood is a dense area with smaller roads and some restricted car access area. It occurs that the private cars use around Arkaden is extremely lower than the two shopping centers.

Table 10 Shopping centers and transportations choices

Shopping centers	Location	Private cars	Public transport	Pedestrian/ Bicycle	Others
Arkaden	City center	26%	35%	37%	2%
Madla AMFI	District center	80%	20%		0%
Kvadrat	In the edge of the city	90%	3%	6%	1%

Table 10 also shows that people prefer to walk than using public transportation to go to those shopping centers. One of the reasons might be the high availability of pedestrian access towards the shopping centers although some of the pedestrian paths need to be upgraded in order to establish safer and pleasant walking experience. Berge (2012) explained that high amount of pedestrian occurs when the distance to a destination is less than 500 meters. In addition, he ensured that many people are still willing to walk up to 3 km. It means that actually most people who live around the shopping centers walks to the shopping centers.

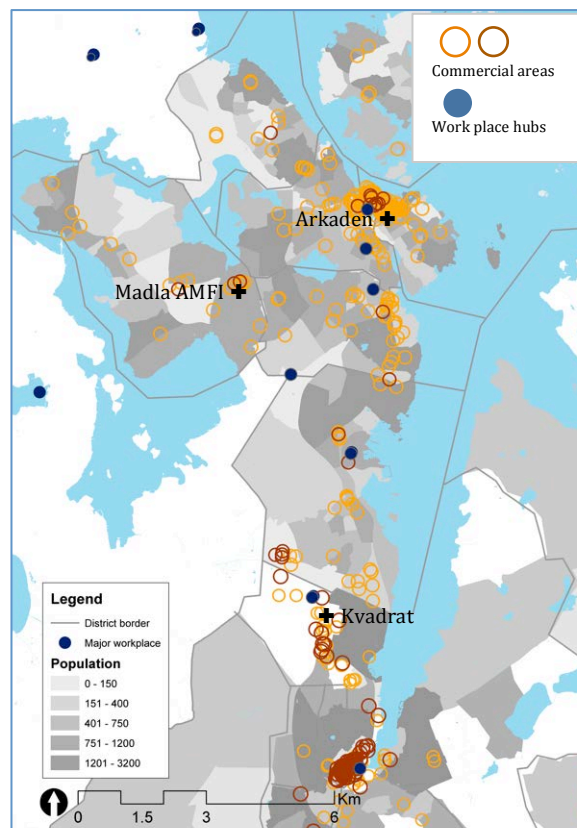


Figure 7-1 Distribution of commercial areas and work place hubs in Stavanger region. Source: Norge digital and ArcMap software.

In Stavanger region, bus is the main public transportation mode. The city is developing new busway links that will be accomplished by 2020. The busway development plan shows better connectivity and accessibility as the routes enable people to travel extensively. The better busway system is expected to encourage people in using the bus over private cars for their trips including shopping trips. Therefore, the proportion of public transport in Table 10 will be higher enough to compete the private cars use.

The city regulation proposed a high density development in the center areas. It is expected to promote local shopping. The more people living in the center, the greater chance people will do the shopping around the center therefore reducing the total travel distance. In addition, providing multipurpose functions such as offices and business,

commercials, and housing in the center area will increase the linked trips. Chart 30 shows the proportion of different building functions in the shopping centers area. Arkaden's neighborhood has more mixed facilities than the other two shopping centers. The varieties of buildings functions in one area enable people to conduct several visits in one travel, for example, visiting the shopping center then the sport facility directly from work before traveling back home. Meanwhile, Madla AMFI's neighborhood is denser than Kvadrat's neighborhood, but Kvadrat consists of more mixed functions. Therefore, Kvadrat is able to promote more linked trips than Madla.

Figure 7-1 shows the relation between commercial areas and work place hub in Stavanger region. Obviously, Kvadrat neighborhood has less dense area than Madla AMFI. Kvadrat's location in the low density area may triggers longer travel distance. However, the proximity to the work place hub in Forus allows people to perform more linked trips than Madla AMFI where there are not any work place hubs nearby.

8 CONCLUSION

There is nothing like a single conclusion from the discussion about shopping centers and a city without giving due weight to all necessary elements of a city; typology, location, density, accessibility, and transportation. In order to achieve the necessary over all patterns, there should be some strategies and regulations that are applied differently to shopping centers based on their contexts.

Shopping centers is one of the important hubs in a city. They are able to significantly generate people's mobility and thus determine which types of transportations to use. Despite of private cars dominance, short proximity from some shopping centers to other building functions in the Stavanger region determines to a great extent in achieving sustainable transportation. In addition, establishing public transport infrastructures close to the shopping centers help to achieve sustainability as it may reduce the use of private cars for shopping trips.

Good integration between shopping centers in Stavanger region and their neighborhoods is indicated by the availability of pedestrian infrastructures and public transport system. Upgrading those features help to achieve a better coherence between the shopping centers and the neighborhoods. In addition, densification plans in some district centers close to the shopping centers will also help to increase the chance of a better integration.

In the case of an introvert shopping center, its typology is often resulting a poor integration with the neighborhood. A shopping center that has parking lot around the building and provides only few entrances tends to separate the spatial and social interactions between the shopping center and both the local neighborhood and the wider urban fabric. This consequence can be minimized by locating a shopping center in a dense populated area and close to the other building functions such as in a district center or a city center. The physical configuration of a shopping center should ties with the surrounding fabric such as building sizes and street pattern. It should be able to maintain good relationship with the other commercial buildings and thus create one solid commercial function that improves livability of the neighborhood. In addition, it is necessary to provide good accessibility for pedestrian in order to increase the use of sustainable transportation such as public transport and walking or cycling. Limiting parking area also helps to restrain private car use to a shopping center. In return, reducing parking area will helps the shopping center to optimize its sales area.

Significant size different between a shopping center's building and its neighboring buildings in the district center area should be controlled by the city regulation in order to materialize harmony and integration of the neighborhood. Shopping center should be able to presents more civilized building by providing good pedestrian access, as well as minimized the gap between a shopping center and the outside environment. This strategy is manifested by providing several entrances at a shopping center and placing them in an immediate distance to the pedestrian and street area. However, the size limit regulation might challenge a shopping center in obtaining a higher turnover. Therefore, it is necessary to provide grocery stores as they help to boost its turnover. However, a shopping center that has grocery stores should concerns the possibility of the increased

car traffics as most of visitors prefer to use cars for groceries shopping. Some ways to overcome that problem are to develop a one-stop shopping destination that has a wider range of stores, including grocery stores, or to distribute shopping centers in every district and thus attract local visitor who often prefer to walk to the shopping center. Local shopping also helps to generate sustainable transportation as it reduces travel distance from where the people live to the shopping center.

A shopping center that is located in the periphery of a city may create some issues such as increasing the number of private cars and generating sprawling development. The location of this type of shopping center is often difficult to reach without a car. Moreover, shopping center in this area is often isolated with the rest of the city and is located in low density area. It is important to place this type of shopping center adjacent to other buildings functions such as work places. Therefore, it will increase linked trips especially by people who use private cars. At the same time, it is necessary to provide good public transportation system in order to establish good connection with the city and helps in reducing private cars.

In short, the recommendation of strategies in each type of shopping center, respectively:

Shopping center in a city center:

1. The shopping center's building should be able to adapt to the existing urban fabric such as neighboring building size and surrounding street pattern
2. Establish good relationship with the neighboring commercial areas.
3. Improves pedestrian access by providing several entrances and limits parking space. These strategies will help to reduce car traffics towards the shopping center and generates pedestrian friendly environment.
4. Provides visitors' favorite stores (e.g. foreign chain stores) to maintain a high number of visitors and turnover.

Shopping center in a district center:

1. The shopping center should not exceed its regulated size in order to achieve a balance proportion with the existing dense-neighborhood.
2. It should provides at least one grocery store to compensate potential stagnant turnover due to the size restriction in developing the shopping center
3. The neighborhood area should be dominated by housing to encourage local shopping and thus minimize travel distance.
4. The shopping center should provide good pedestrian access to facilitate local inhabitant who walk to the shopping center.
5. Placing the shopping center close to the transit hub of the district center therefore increase accessibility to the public transport system

Shopping center in the periphery of the city (regional shopping center):

1. Major transportation accesses such as a highway exit, a railway station, a light rapid transit or a busway stop should be available as close as possible to the shopping center to help in reducing the private car use.

2. It is important to place the shopping center adjacent with other building functions such as commercial or office and business functions therefore increase linked trips.
3. The shopping center should be big enough to establish a one-stop shopping destination that provides a wider range of stores as it helps the shopping center in increasing its turnover and at the same time reducing total number of trips by its visitors.
4. The outside environment of this type of shopping center may not be pedestrian friendly. However a safe pedestrian access should always be available especially the one that connect the closest housing area. In addition, providing an integrated lane for bicycle will helps to connect the shopping center with the farther neighborhoods and thus decrease the unnecessary private car use.

Finally, a shopping center's realm is one fragment of urbanity that needs to be fused with the people and the city. The notions of integration and sustainability should be put forward by those who desire to live in a more livable city. In time, shopping centers will become sufficient to be one of the urban catalysts that are able to enhance the society and the viability of a city.

REFERENCES

- Arkaden Torgterassen factsheet. Retrieved from <http://steenandstrom.welovemondays.st/content/uploads/2015/07/Se-fakta-om-Arkaden-Torgterrassen.pdf>
- Barvik, K. (2007). *Stavanger-regionen næringsutvikling: Strategi for næringsarealer*. Asplan Viak.
- Berge, G., Haug, E., & Marshall, L. (2012). *Nasjonal gåstrategi: Strategi for å fremme gåing som transportform og hverdagsaktivitet*. Rapport nr. 87. Retrieved from http://www.vegvesen.no/_attachment/528926/binary/851213?fast_title=Nasjonal+gåstrategi.pdf
- Bjørheim, C. (2016, Jan 5). Nedgang for Kvadrat i 2015. *Stavanger Aftenblad*. Retrieved from <http://www.aftenbladet.no/lokalt/Nedgang-for-Kvadrat-i-2015-16641b.html>
- Crawford, Margaret. (1992). *The World in a Shopping Mall*. In Miles, M., Hall, T., & Borden, Iain. *The City Culture Reader* (p.125-140). New York, NY: Routledge.
- Gibbs, R. J. (2012). *Principles of Urban Retail Planning and Development*. New Jersey: John Wiley & Sons. Inc.
- Graham, S. & Marvin, S. (2001). *Splintering Urbanism; Networked Infrastructures, Technological Mobilities and the Urban Condition*. New York, NY: Routledge.
- Gruen, V. (1973). *Centers for the Urban Environment: Survival of the Cities*. New York, NY: Littion Educational Publishing, Inc.
- Gruen, V., & Smith, Larry. (1960). *Shopping Towns USA: The Planning of Shopping Centers*. New York, NY: Reinhold Publishing Corporation.
- Guy, C. M. (1997). Controlling New Retail Spaces: The Impress of Planning Policies in Western Europe. *Urban Studies*, 35(5-6), 953-979.
- Guy, C. (2007). *Planning for Retail Development; A Critical View of the British Experience*. New York, NY: Routledge
- Hillnhütter, H. (2016). *Pedestrian Access to Public Transport* (doctoral dissertation). University of Stavanger, Stavanger.

- Hall, Tony. (2015). *The Robust City*. New York, NY: Routledge.
- Hegsvold, K. & Onarheim, S. (2013). *Handel I og utenfor bysentrum*. Asplan Viak Rapport 532538.
- Hjorteland, K. & Nicolaysen, M. N. (2015). *Senterstruktur: En tilstandsrapport over sentrene som inngår i "Regionalplan for Jæren 2013-2040"*. Rogaland Fylkeskommune Rapport.
- Lodden, U. B. (2002). *Sykkelpotensialet in norske byer og tettsteder*. TØI rapport 561. Oslo: Transportøkonomisk institutt.
- Lowe, M. (2005). The Regional Shopping center in the Inner City: A Study of Retail-led Urban Regeneration. *Urban Studies*, 42(3), 449-470.
- Miljødepartement. (2000). *Planer og bestemmelser for kjøpesentre*. Oslo: Statens forurensningstilsyn (SFT)
- Nielsen, G. & Kvarud, T. (2010). *Styring av handel og senterstruktur på Jæren*, TØI rapport 1051. Oslo: Transportøkonomisk institutt.
- Nortømme, M. E. & Meland, S. R. (2013). *Reisevaneundersøkelse for Stvangerregionen 2012*. Trondheim: SINTEF Teknologi og samfunn.
- Nærland, E. Ø. (2012, Oct 23). Kvadrat får Sandnes-hjelp. *Stavanger Aftenblad*. Retrieved from <http://www.aftenbladet.no/lokalt/Kvadrat-far-Sandnes-hjelp-436821b.html>
- Robertson, K. A. (1999). Can Small-City Downtowns Remain Viable?. *Journal of the American Planning Association*, 65(3), 270-283.
- Rogaland Fylkeskommune. *Rogaland - en skapende region med vilje til vekst*. Retrieved from www.rogfk.no
- Sandnes kommune. (2011). *Kommuneplan for Sandnes kommune 2011-2025*. Retrieved from https://www.sandnes.kommune.no/Fillager/Internett/dokumenter/planer/kommuneplan/gamle_kommuneplaner/2011_2025/Kommuneplan_Samfunnsdelen.pdf
- Seglem, E. (2106, Jan 17). Kvadrat ikke lenger blant Norges fem største kjøpesentre. *Stavanger Aftenblad*. Retrieved from

<http://www.aftenbladet.no/okonomi/Kvadrat-ikke-lenger-blant-Norges-fem-storste-kjopesentre-15612b.html>

Spare Bank1 SR-Bank. (2016). *Varehandelsrapporten 2016*.

Staten Vegvesen. (2014). *Kollektivhåndboka: Tilrettelegging for kollektivtrafikk på veg og gate*. Retrieved from www.vegvesen.no/Fag/Publikasjoner/Handboker.

Statistisk sentralbyrå. (2016) Befolkning: Folketall. Retrieved from: www.ssb.no

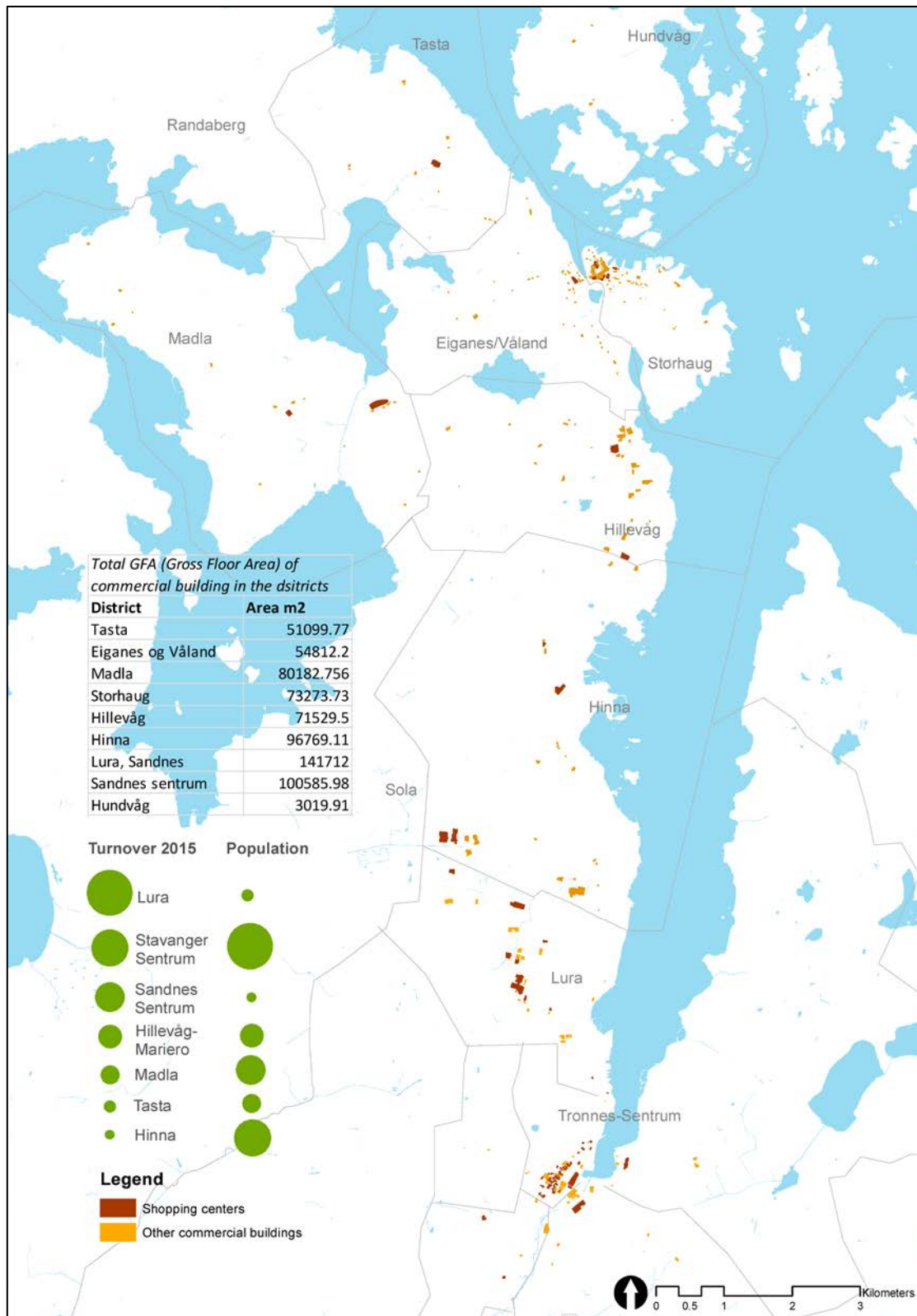
Stavanger kommune. (2015). *Kommuneplan for Stavanger 2014-2029*. Retrieved from <http://www.stavanger.kommune.no/Documents/Kommuneplan/Kommuneplan%2014-29/Godkjent%20plan/Planbeskrivelse%20VEDTATT%20PLAN.pdf>

Transportøkonomisk institutt. (1998). *Kjøpesentre - lokalisering og bruk: En undersøkelse av Ski storesenter og Vinterbro senter med focus på marked og transport*. Oslo: Transportøkonomisk institutt biblioteket.

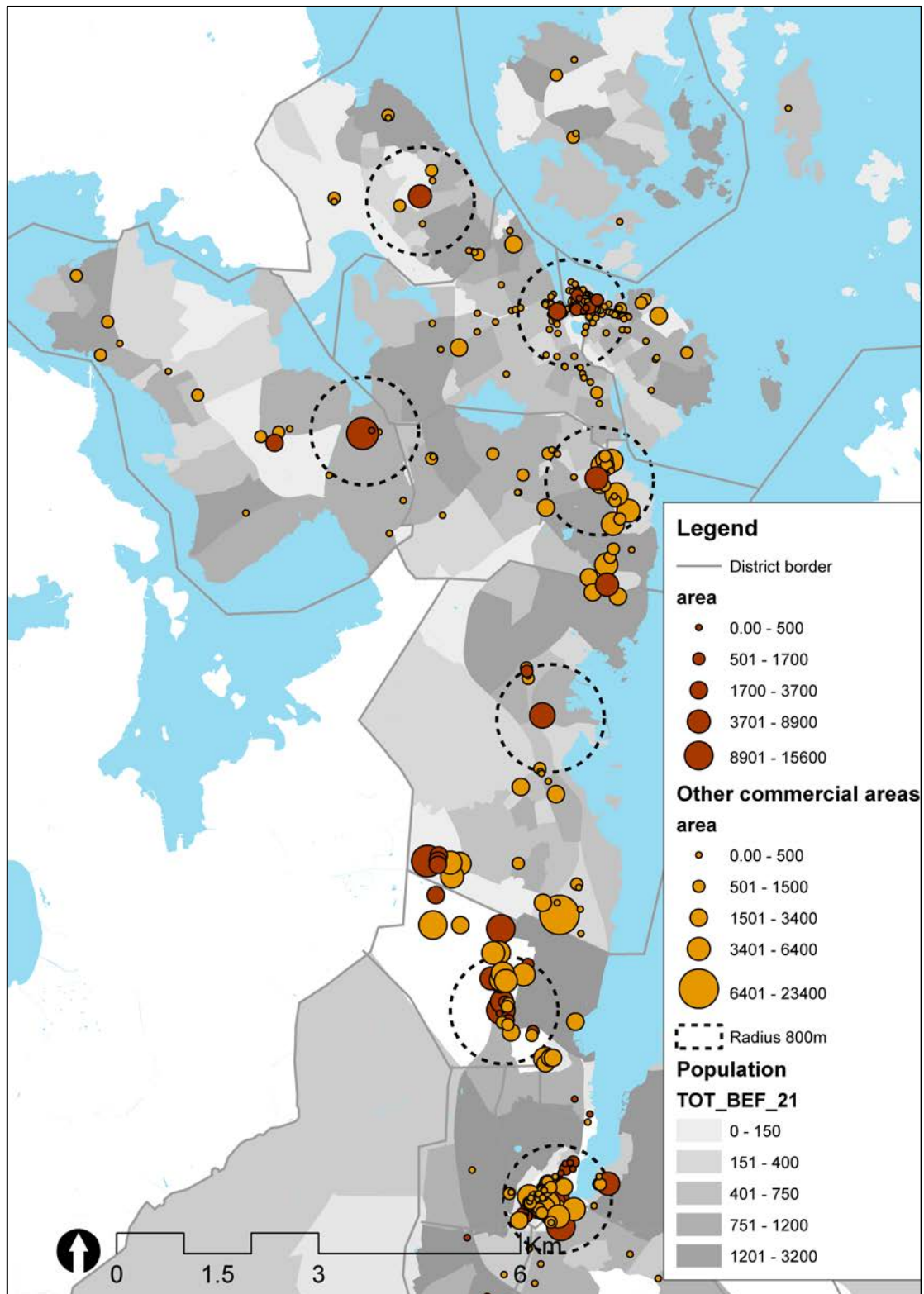
ABBREVIATIONS

- BRA : Bruksareal (m²)
- GLA : Gross Leasable Area (m²)
- GFA : Gross Floor Area (m²)
- RPB : Rikspolitisk bestemmelse
- TØI : Transportøkonomisk institutt
- SIFO : Statens institutt for forbruksforskning

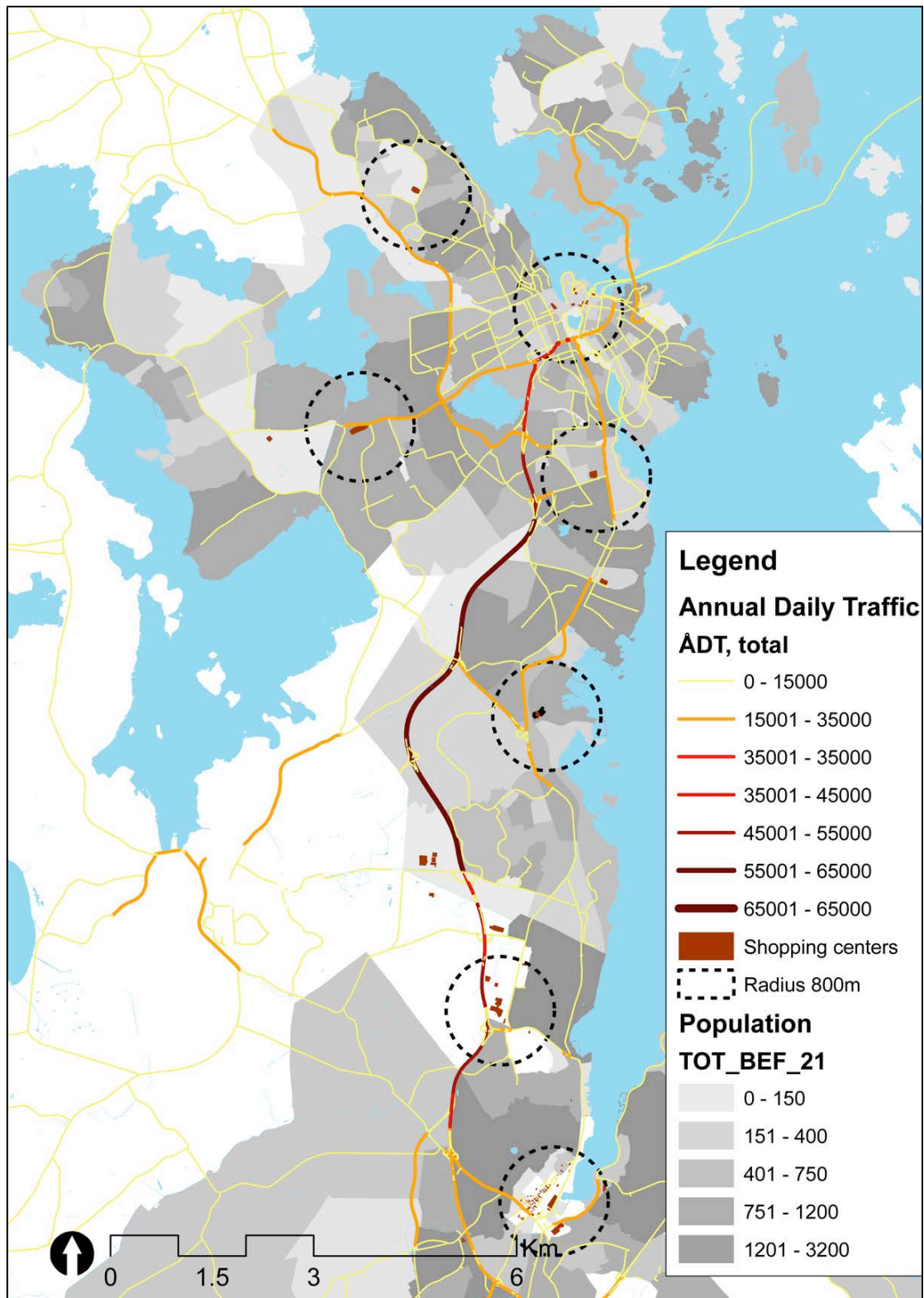
APPENDIX 1 Distribution of Shopping Centers, the sizes, and Population,



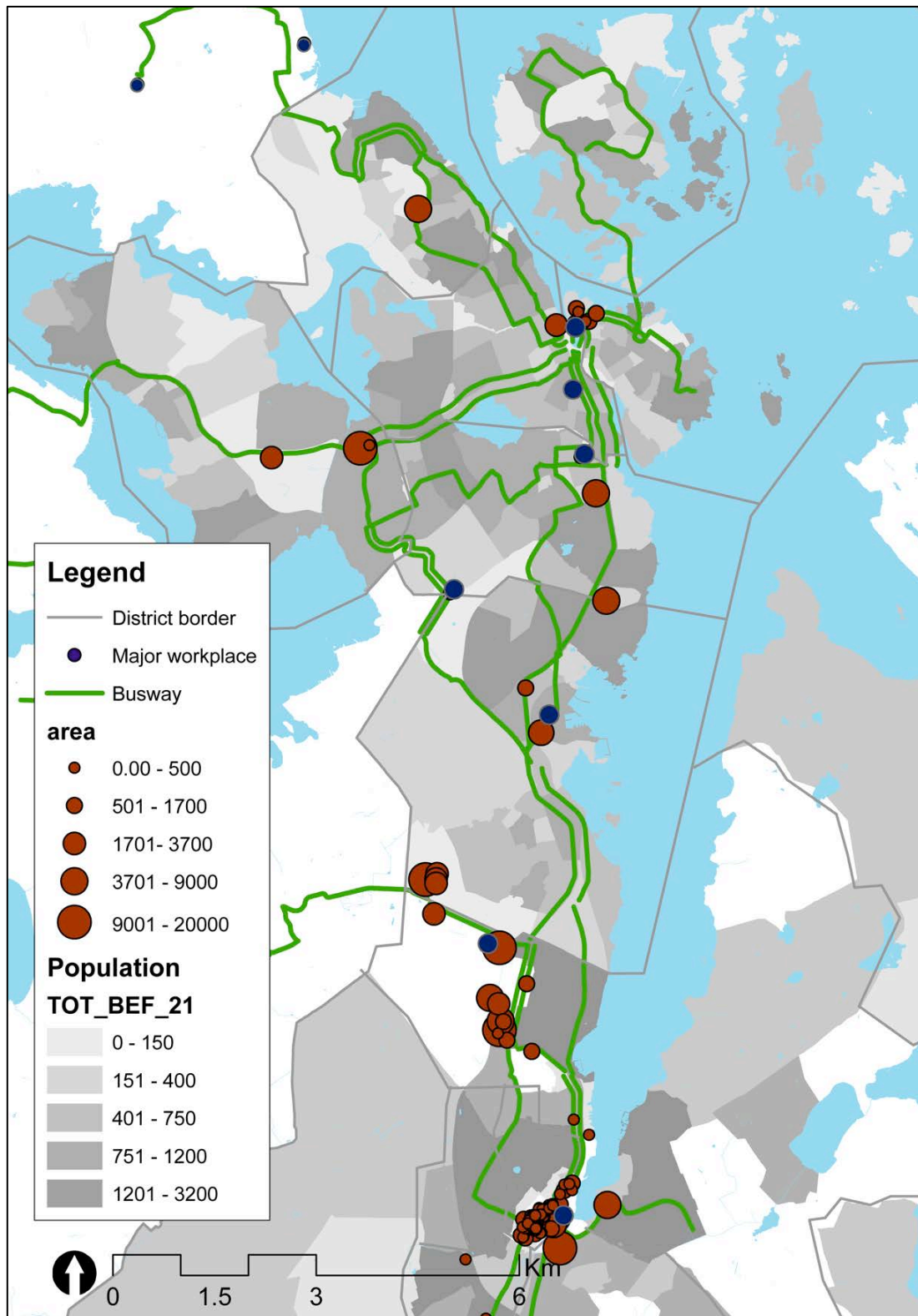
APPENDIX 2 Number of Population and The Sizes of Shopping Centers



APPENDIX 3 Annual Daily Traffic in Stavanger Region



APPENDIX 4 Busway Networks, Population, and The Shopping Center Sizes (m2)



APPENDIX 5 Location And Size Allowance For A District Shopping Center

Plan- og bygningsloven (PBL) § 11.10

Bestemmelser om etablering av handel i Stavanger kommune

Bydel	Senter	Type senter	m ² BRA detaljhandel
Kommunen	Stavanger sentrum	Regionalt senter Bydelscenter for bydelene Eiganes- Våland og Storhaug	Fri etablering
Hundvåg	Hundvågekrossen	Bydelscenter	10.500
Tasta	Tastarustå	Bydelscenter	10.000
Madla	Madlakrossen	Bydelscenter	30.000
	Kverntorget	Lokalsenter	4.500
Eiganes og Våland	(Stavanger sentrum)		
Storhaug	(Stavanger sentrum)		
	Tinnfabrikken	Lokalsenter	3.000
Hillevåg	Hillevåg torg	Bydelscenter	40.000
	Tjensvollsent	Lokalsenter	1.500
Hinna	Jåttåvågen	Bydelscenter	10.000
	Gauselsenteret	Lokalsenter	2.300

APPENDIX 6 Building Units Around Shopping Centers

ARKADEN (STAVANGER SENTRUM)

Buildings type	Units / R= 2 km	Units / R= 800 m
Shopping centers	7	7
Other commercial buildings	216	182
Offices, business, mixed use	350	241
Industries	381	73
Hotel / hostel	29	23
Restaurants/Cafés	49	47
Educational institutions	93	22
Culture and leisure	67	23
Religious institution	29	20
Health facilities	33	3
Housings	11152	2164

MADLA AMFI (MADLA DISTRICT CENTER)

Buildings type	Units / R= 2 km	Units / R= 800 m
Shopping centers	2	1
Other commercial buildings	19	7
Offices, business, mixed use	31	11
Industries	235	38
Hotel / hostel	14	1
Restaurants/Cafés	4	1
Educational institutions	74	13
Culture and leisure	37	6
Religious institution	9	0
Health facilities	11	1
Housings	7961	2027

KVADRAT (LURA DISTRICT CENTER)

Buildings type	Units / R= 2 km	Units / R= 800 m
Shopping centers	11	8
Other commercial buildings	19	10
Offices, business, mixed use	117	30
Industries	358	70
Hotel / hostel	6	2
Restaurants/Cafés	2	1
Educational institutions	47	11
Culture and leisure	16	4
Religious institution	3	3
Health facilities	9	1
Housings	5146	1149

APPENDIX 7 – Interview About Madla AMFI

MADLA AMFI – Interview with the center manager, Anette Ø. Worum (2/11/2016)

General question

1. The history of Madla AMFI/Madlahandelslag
2. Type of shopping center (lokalsenter/bydelsenter)
3. Impact from Madla-Revheim development

Technical question

4. Size of Madla Amfi (is it enough to increase sales?)
5. Turnover/sales and factors relate to it
6. Which store is the biggest
7. Parking lot development (based on customer needs/utleieareal?)

Data about customer:

8. Number of customer (development)
9. Where do they live (same bydel/different bydel)
10. What do they buy (% groceries, clothing, others)
11. Which transportation modes they use (%)

Future Madla Amfi

12. Madla Amfi future development
13. Madla Amfi impact for the city center

Notes:

- *Madla was different kommune = strong community*
- *Thon group 80%, Madlahandelslag 20%*
- *Madla = the point where Norway was united (Harald Hårfagre)*
- *Developing meeting places in the shopping center is important (café/restaurants)*
- *Housing will be incorporated in the future developemnt*
- *Anchor stores = Vinnmonopolet, Coop mega, Rema*
- *The shopping center want to be integrated with the public transport*
- *Grocery shopping is predominant. Clas Ohlson too*
- *Visitors = 80% use cars, 20% walks and public transport*
- *Madla AMFI = nærsenter for daily basis = strong community, never experienced crisis*
- *People in Stavanger like to be at the place where they're used to be (Madlahandelslag). Reluctant with the change (new shopping center)*
- *Size of the shopping center matter. The most important is the service for customer.*
- *People prefer to go to a big shopping center that has a lot of stores*
- *Parking is very important, especially near the grocery store*
- *People can draw people. The shopping center need a lot of visitor = grater chance to get high turnover*
- *Local stores (not only chain stores) are very important to attract visitors (spices store)*
- *Mix customer (Family, women = cubus, hnm, fashion stores – Men = clas ohlson, etc)*

APPENDIX 8 – Interview About Arkaden

ARKADEN STAVANGER – Interview with the center brand manager, Elisabeth Schibeavaag (5/12/2016)

General question

1. The history of Arkaden shopping center
2. Type of shopping center (*lokalsenter/bydelsenter/hovedsenter*)
3. Impact from/to Stavanger sentrum (as a city center)

Technical question

4. Size of Arkaden (is it enough to increase sales?)
5. Turnover/sales and factors related to it
6. Which store is the biggest?
7. Arkaden's response to sustainable transportation concept (private cars use to Arkaden, accessibility towards public transportation)

Data about customer:

8. Number of customers
9. Where do they live (same *bydel*/different *bydel*)
10. What do they buy (% groceries, clothing, others)
11. Which transportation modes they use (%)

Future Arkaden

12. Arkaden future development/expansion
13. Impediment for the development.

Notes:

- *Established in 1988, the biggest in Stavanger sentrum. It was Stavanger Storsenter.*
- *Building D (torgterassen) opened in 1998, Building C (Domekirken) in 2000*
- *Can develop the building without any size restriction. If possible, buy/rent other properties close to the shopping center*
- *Together with the pedestrian street = engine for Stavanger sentrum*
- *Share customers with the pedestrian street*
- *32.000 m2 incl office etc. BRA = 15.000 m2 (utleieareal)*
- *Turnover/sales doesn't always have to do with the shopping center's size. Strategy marketing is also important*
- *There are vacant stores because they are very small.*
- *The biggest store are, respectively, HnM, Cubus, Lindex, New Yorker*
- *Café/restaurant is important, but the pedestrian street offer that facilities. No need to add more of them in the shopping center.*
- *Good relationships with the pedestrian street. Better pedestrian street = better for the shopping center.*
- *Arkaden is one of members of Stavanger sentrum's organization (organize 320 shops in Stavanger sentrum)*

- *Arkaden doesn't have local shops = different standards*
- *Qpark manage the parking space*
- *Parking is few = many people not use car, and there are many parking hubs around Stavanger sentrum*
- *74% of visistors don't use cars (January 2015)*
- *Visitors = 57% from home, 8% from school, 21% from work*
- *Arkaden doesn't provide a big grocery store = How will the visitors carry their stuffs?*
- *Visitors = 75% from Stavanger, few Sandnes, 3,5% Sola, 2,4% Randaberg, 1,7 Finnøy.*
- *Visitors = 70% women, 55% under 40 years old = depends in stores*
- *The most visited stores = HnM, Cubus, Lindex, New Yorker, Matkroken, Apotek1, Kitchn, Bik Bok, Geddon, Mango.*
- *37% by foot, 35% public transport, 26% cars.*
- *Stavanger sentrum = seek for 'life'. The Shopping center approaches that concept.*
- *Infrastructure is the problem for expanding the shopping center*
- *Marketing = higher turnover, campaign*
- *Important stores to be established/added inside the shopping center = General (HnM), and unique*
- *The reason not to have a big grocery store = size consuming, infrastructure consequences*

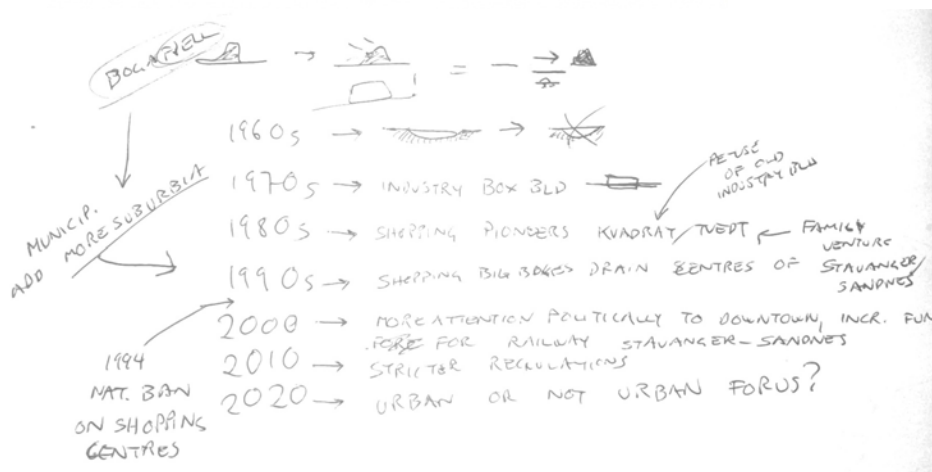
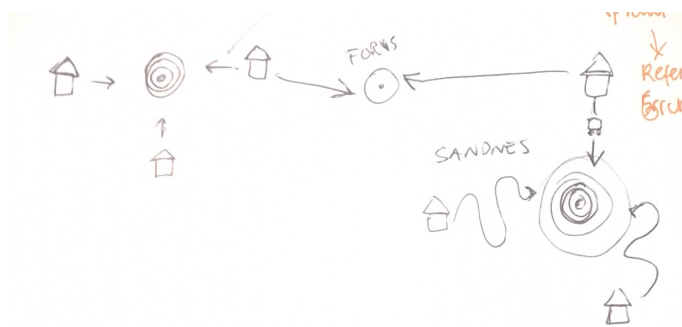
APPENDIX 9 – Interview About Forus and Sandnes Development

Questions about Sandnes - Interview with an urban planner, Harald Brynlund-Lima (9/11/2016)

- Sandnes kommune, Forus-Lura, and Kvadrat shopping center (as the only regional shopping center in Jæren). *The regulation about a regional shopping center in the region? Why the shopping center is located in Sandnes? What is the role of Forus development for Sandnes?*
- The impact/contribution of Kvadrat shopping center to the neighborhood back then, present, future (after the shopping center's expansion)
- Kvadrat shopping center and the city centers (Sandnes and Stavanger sentrum). *Do they co-exist or compete?*
- Local people in the surrounding area (of Kvadrat) and Sandnes people about Kvadrat shopping center.
- Kvadrat, private cars, and public transportation system.

Notes

- *Kvadrat shopping center = close to the highway = easy access
= close to workplace = practical*
- *Forus = car based area*
- *Busway = not covered residential area where most of people live (sprawl / scattered)*
- *1994 = national ban on expanding shopping center*
- *Approx 40.000 jobs in Forus*
- *People doesn't live in the center with poor access to public transport*
- *The region itself is sprawling = more cars*



APPENDIX 10 Madla AMFI Factsheet 2016

UTLEIEPROSPEKT

AMFI MADLA

AMFI MADLA Madlakrossen 7 | 4042 Hafslund | amfi.no/madla

EIER Forretningsbygg AS

BYGGÅR – EVT UTBYGGINGER Madlatorget 1991, utbygging til AMFI Madla 2007

FORVALTET AV Amfi Drift AS

m² TOTAL AREAL 64 000	kr FORVENTET OMSETN 2016 1,33 mrd	P PARKERING (INNE OG UTE) 640	 LEIETAKERE 91	 BESØKENDE 2015 3,9 mill
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Anette Ø. Worum
Sjefleder
+47 919 17 222
anette.worum@amfi.no



Sem Ueland
Driftsleder
+47 900 69 269
sem.ueland@amfi.no



Hilde Kringlebotn
Utleiesvarlig
+47 952 48 090
hilde.kringlebotn@amfi.no

UTLEIE AREAL
26 600

OMSETNINGSUTVIKLING

År	Omsetning i mill. inkl. mva	Endring i % forrige år, alle tall	Endring i % sammenlignbare tall
2015	1,33 mrd	+2,15	+0,79
2014	1,30 mrd	+6,20	+3,70
2013	1,25 mrd	+5,07	+2,29
2012	1,17 mrd	+6,24	+2,78

KOMMENTAR

BUTIKKER

Bransjer	Antall butikker
HUS OG HJEM	12
KLÆR, SKO, REISEEFFEKTER	29
MAT OG DRIKKE	6
SERVERING	6
SERVICE- OG TJENESTEYTENDE	7
SPESIALBUTIKKER	15
ANDRE LEIETAKERE (kontorer etc.)	16
SUM ANTALL LEIETAKERE	91

NØKSEL-LEIETAKERE

Vinmonopolet, Coop Mega, Clas Ohlson,
Apotek 1, Cubus, Intersport

AMFI / THON EIENDOM

Amfi Drift AS er et selskap i Olav Thon Gruppen, som er Skandinavias ledende kjøpesenteraktør. Thon Eiendom eier eller forvalter 97 sentre fra Svalbard i nord til Mandal i sør, samt 10 sentre i Sverige. Av disse er 72 hel- eller deleide kjøpesentre, og 35 i forvaltning for eksterne eiere. Deler av kjøpesenterporteføljen markedsføres og forvaltes under samme navn; Amfi.

- 97 kjøpesentre i Norge
- 10 kjøpesentre i Sverige
- 63 mrd. NOK i butikkomsetning Norge
- 11,5 mrd. SEK i butikkomsetning Sverige
- 170 mill. besøkende årlig
- 6 000 leietakere
- 8 av Norges 10 største kjøpesentre



MARKED

Målgrupper Viktigste kundegruppe

Familie- og bydelscenter for alle målgrupper, med spesielt fokus på handlende kvinner i alle aldre.

Beliggenhet Infrastruktur/kommunikasjon

AMFI Madla ligger i bydelen Madla, 3 km utenfor Stavanger sentrum og har gode og hyppige bussforbindelser.

Senterets posisjon Kundeløfte/verdier

Hjertet i lokalsamfunnet.
Kundeløfte: Mye å glede seg til. Alltid.
Verdier: Levende engasjert. Profesjonell kremmerånd, involvering og samhandling. Viljen til å overraske.

Senterets marked Antall innbyggere

Kommune/ bydel/område	Primærmarked	Sekundærmarked
STAVANGER	129 191	
RANDABERG		10 265
SOLA		23 615
SANDNES		68 853
RENNESØY		4 388
SUM	129 191	107 121



KOMMENTAR

Madla er et av Stavangers mest kjøpesterke og internasjonale områder.

Dette blir understreket av undersøkelser som viser at hver kunde handler gjennomsnittlig for 23% mer på AMFI Madla sammenlignet med andre kjøpesenter i regionen.



Befolkningsutvikling, SSB-tall og senterleders kommentar

Befolkningsutviklingen i området er sterkt økende. I 2020 skal et av Stavangers største utbyggingsprosjekt startes kun et par hundre meter fra AMFI Madla hvor det i løpet av noen år skal bygges 4000 nye boliger.



BESØKENDE 2015

3,9 mill