

Organization of Regional Rail Public Transport

An integrated system is important if we want to increase the public transport share



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Master Thesis in Transport Systems

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Stockholm 2014

TSC-MT 14-004

Preface

This master thesis was done in order to investigate the development of the regional public transport in Sweden. Connecting the organizational work within each region with statistics as a measure of how developed the public transport system is.

Because of a recent move from Stockholm to Gothenburg this thesis has been conducted at Trivector Traffic in Gothenburg under the supervision of Helena Sjöstrand and PG Andersson during the spring in 2014. As I'm still studying at KTH in Stockholm my supervisor Karl Kottenhoff is from KTH.

There are a total of nine interviews representing different roles in different regions in this thesis. Without them this thesis would not be anything at all, many thanks for your time and sharing of valuable information. Who these persons are, can be found in the first section of the references at the end of the report.

I would like to give a special thanks to Helena Sjöstrand and PG Andersson at Trivector traffic that supported me during the work and also provided valuable information, tips and a desk to work at. My supervisor at KTH, Karl Kottenhoff is also one of those deserving my gratitude.

Abstract

Public transport shows large regional disparities in development. This report aims to determine if any part of the cause is to be found in the form of the regional public transport organizations. There is no doubt about the eager for increasing the public transport market share beyond societal basic principle where the public transport covers school and work commuting in order to be an environmentally friendly substitute for the car. The amount of money spent on public transport and the idea of an integrated system differs from region to region, what seems to be the optimal way of creating a regional transportation to increase the public transport market share?

The population is getting bigger and bigger and this fact contributes to regional growth round cities in Sweden. To fulfill necessary needs regarding transportation for these people living in the outer part of a region, counties are working together to simplify the travel. What's making this work difficult is that every county has their own prices for purchasing monthly passes to access the public transport, and since these passes aren't valid for journeys across the county border, this limits the regional growth. In addition to this fact that counties have to erase the difficulties with handling different situations within each county, the public transport has been since the year 2012 deregulated in Sweden and the market is open for any transport company to start a business. Many companies in the same area also create a confusing situation for the travelers regarding the needs for different tickets for different part of the same journey. If a traveler misses the intended departure it is not certain that she can take the next departure if this is provided by another company. All together create county borders, many companies, increasing need for regional growth and travel together with a severe economic situation the foundation for this investigation.

The report is conducted by studying reports, books and other available information such as the traffic development program from each county. This information is compared with a model with statistics from each region and at least one representative in the form of an experienced employee from the public transport sector in each region. This data and analysis work as the foundation for the results in this thesis.

The results are showing that different regions in Sweden are spending a very different amount of money on public transport. This is a fact that is depending on the amount of people and population density in each region. The organizational structure is similar in a way where all regions understand the importance of coordination and have some sort of organization between all adjacent counties included in each region. The southern region is the most efficient region; according the economics meanwhile the west region spends the most money on public transport. The results are also showing that the regions having trouble with handle the needs of the counties at the same time as the economics are limited. All counties in Sweden should look for the opportunity for a commercial operator to

provide the public transport since the new law in the year 2012, but very few lines are actually carried out by a commercial actor. There are a lot of interesting indications that can be further discussed after reading this report.

Sammanfattning

Svensk titel: Organisationerna bakom den regionala tågtrafiken

Svensk undertitel: Ett integrerat system är viktigt om vi vill öka kollektivtrafikens marknadsandel

Kollektivtrafiken är ett ständigt hett ämne som alternativ till bilen och det har hänt mycket de senaste åren. En ny lag år 2012 innebar att hela kollektivtrafiken är avreglerad i Sverige och fler bolag lockas till branschen. Länsgränserna i Sverige orsakar tröga system och svårigheter för resenärerna. Det blir med andra ord fler och fler faktorer som påverkar resan från start till mål. Rapporten syftar till att avgöra om någon del av orsaken kan förklaras i de regionala kollektivtrafikorganisationerna. Det finns ingen tvekan om angelägenheten i att öka kollektivtrafikens marknadsandel bortom samhällsliga grundprinciper där kollektivtrafiken ombesörjer skol- och arbetespendling för att vara ett miljövänligt alternativ till bilen. Den summa pengar som spenderas på kollektivtrafiken och idén om ett integrerat system skiljer sig från region till region, vilken lösning verkar vara det optimala sättet att skapa en regional kollektivtrafik som ökar kollektivtrafikens marknadsandel?

Det finns indikationer som visar på svårigheter när det gäller att få ihop ekonomin inom kollektivtrafiken i samband med kommersiella aktörers entré. I västra Sverige spenderas det mest pengar på kollektivtrafiken och i söder är den ekonomisk effektivast i landet.

I rapporten kan det dras slutsatser om att organisationerna som ligger bakom den regionala kollektivtrafiken har ett viktigt uppdrag och kan påverka trafiken i stor utsträckning. Svårigheterna ligger i en avreglerad marknad som ställer krav på kommersiella aktörers intåg, samtidigt som länens grundbehov ska täckas. Frågor om det kan vara på tiden att reglera en avreglerad marknad väcks och beslutsfattare i Sverige måste agera innan resenärer överger kollektivtrafiken för enklare alternativ som t.ex. bilen.

Keywords: Public transport, Regional public authorities, Organization, Integrated system, Regional traffic development plan

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1 Introduction

Sweden is divided into 21 counties with invisible borders for commuting inhabitants, but they induce a lot of economical obstacles for the travelers. The possibility for a traveler to understand the differences between each county is small and especially if one lives close to the county border.

If public transport should become a natural choice for traveling, which indicators are important to you?

-Simplicity

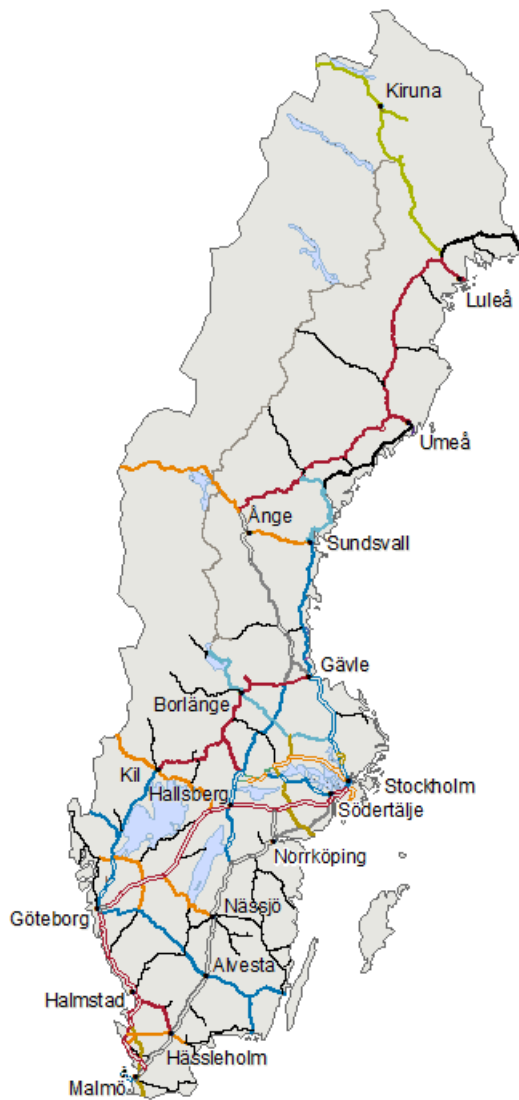


Figure 1 - Map over Sweden with the existing rail network (Trafikverket, 2014).

When the western region in this project interviewed 1500 people for one hour each, the overall answer to what's important regarding the use of public transport an overwhelming majority state the importance with a simple and understandable ticket system¹. When people are moving within a country they want to go as quick as possible from one place to their destination as easy as possible. To travel with ease often include as few transfers as possible with, in the best case scenario only one ticket. This study is created in order to map the cooperation between the organizations behind railway and buses within Sweden. Both in terms of how they work together with the ticket system and how well they match each other's in a certain time schedule and also how well different counties work together regarding interregional trips between different counties.

Invisible borders between counties are forming the regional train system in Sweden and the confusion of why a ticket is more expensive on one way than another is notable. As a consequence of a complicated system people tend to take their car instead of the public transport. A high percentage of trips made by public transport will hopefully lead to a low percentage of car usage; there is a direct link to save

¹ The question was not asked in this particular way but the answer when discussing important parts of the public transportation were simplicity according to Jan Efraimsson, head of public transport investigation at Västra Götalandsregionen.

the environment, money and time by improving the collaboration between different public transport operators and counties. By looking into all different regions in Sweden to give a brief feeling for how it works, this report will compare them more thoroughly to investigate this phenomenon further.

1.1 Background

It can be seen that the development of public transport is different across the country by looking at data in the form of cost coverage, travel behavior, increased use of public transport, etc. Within Sweden there are different views of developing the public transport in different parts of the country. There are many different solutions that from the beginning seems to be the best suitable solution for that region, but since the region grows and the borders are fading out it might not be the case anymore. In 2009 the government decided to remove the monopoly from the railway at weekends and at year 2010 this was a fact for every day. Three years later in 2012 the same thing happened to the public transport sector when it comes to buses. In other words, there is now a free market for any company to start a public transport business anywhere in Sweden. It should be noticed that there are not totally free for a railway company since the ultimate decision of distributing capacity on the rails still lies on a political level at Trafikverket to decide, but anyone can leave a proposal (Riksdagen, 2010).

Since the new public transport law was implemented in the year 2012 Sweden has created regional public transport authorities in each county I Sweden. Which part of a county that takes this role differs from county to county, but the main idea is to include the public transport development in the development of the region itself. The consequence for a traveler is that there are now goals and ideas for further development of the local public transport in every county. There are some companies that act on their own on a commercial basis and all of a sudden the usual trip from home to work includes in many different interests. If the case is that regional and interregional travelling companies do not cooperate with each other's it will turn out to be needed for a traveler to buy one ticket per company at different prices depending on the direction of a trip. For example a trip from Malmoe to Kalmar can be bought at one price with one ticket if the journey starts at Malmoe, but there is another price and if the trip starts from Kalmar to Malmoe and the traveler also needs two tickets in that direction. As the number of companies grows the complexity grows with it (P Ålind. 2014).

1.2 Project motivation

As the need for interregional² travelling increases as the labor market grows, the travelling process needs to be as easy as possible to create an attractive transportation option for people. If the public transport option is bad, people tend to take the car or move closer to

² between counties

the job and in some cases the car isn't a good option because the difficulties find a parking spot in the city center. This problem is even bigger for small counties close to a larger county with a greater city since the majority of the job opportunities lay within the bigger cities (J. Kyrk., 2014).

This project should work as an introduction to this problem where a homogenous system and thinking could simplify the travelling and growth of a region. Even though there are a lot of different companies and ideas involved in the travelling it could still work as an integrated system.

This project could lay in interest for companies in the business where smaller interactions with rival companies could gain all of them. If a connection can be found between the interaction between companies and how well-used the transportation mode is used, this thesis can be useful for politicians trying to work against a goal where it is said that the public transportation use should be doubled in the year 2020 compared to today. The discussion whether the goal of doubling the public transport share at year 2020 is good or not is a whole thesis itself, but worth mention is that this project does not act after a strict goal. Instead the important findings in this project should be connections between different transport modes and emphasize the contribution to the bigger picture this can give.

1.3 Objective and scope

Investigate the regional public transport in Sweden and compile a proposal for important factors regarding organizing the regional public transport.

In regions with a large amount of interregional travel pattern, people have created organizations with representatives from the different transportation companies in the region to erase the borders and overcome troubles with many transfers. This is done in many different ways and this project is due to look into these different organizations to see if some solutions seem to be more successful than others. The findings should lead to conclusions regarding the relation between cooperation and public transport statistics.

1.4 Limitations

This project will give an introduction to the regional train systems within Sweden. This means that it will not cover all bus lines and it will exclude local public transport that does not involve any interregional travelling between counties. This thesis will look into a few of these regions more thoroughly in order to get more details of interesting cases that comes with this work.

Regarding the local trips, there are a number of assumptions that are necessary because there is no data specified for exactly what proportion of the number of journeys made that are regionally or locally journeys respectively. In order to make the statistics reflect a more

correct picture of the regional trips in the statistic chapter each county in Sweden is modified by a certain factor.

The data available is the exact share between local and regional trips within Skåne County, which indicates that there are only 33 % of the bus trips that are regional trips (Skånetrafiken, 2011). This will work as a national norm in this report where all bus trips in Sweden will be reduced by the factor 0.33. In addition to this the two biggest cities in Sweden, namely Stockholm and Gothenburg have a well-used metro and tram lines which not are regional trips. Therefore the data from Stockholm and Gothenburg will be modified in a way where all metro and tram journeys are removed. The advantage of this is that the statistics get closer towards the true value of the regional trips within the regions with bigger cities, but the disadvantage is that it is not exactly the same situation in all regions of Sweden. This means that some regions will be presented with lower values and some regions will be presented with higher values. All together this approach will on average give fare data in order to execute the comparison.

The factors for each county that were calculated are presented below:

County:	Factor:	
Stockholm	0,26	The ideas with the factors are to reduce the bigger cities local trips. This is used in chapter six when presenting the statistics for the population and the number of trips. Presenting the eastern region without Stockholm would give a false picture of the situation, but also it would be a misrepresentation if Stockholm were included unmodified when this city is so different from the others. There are many people in Stockholm who do not travel more than locally in Stockholm and there is a large number of traveling with the subway. The same situation is true for Gothenburg, but instead of traveling by the subway people are using trams. By reducing the number of trips many local trips are removed and the comparison between regions is more accurate. It is important to denote that this data is highly uncertain, and therefore this modification was made in order to show how it may look like rather than draw any conclusions from it. In other words, the main comparison will not be based on this data.
Uppsala	0,44	
Södermanland	0,35	
Östergötland	0,34	
Jönköping	0,42	
Kronoberg	0,49	
Kalmar	0,39	
Gotland	0,33	
Blekinge	0,49	
Skåne	0,50	
Halland	0,59	
Västra Götaland	0,23	
Värmland	0,37	
Örebro	0,37	
Västmanland	0,38	
Dalarna	0,36	
Gävleborg	0,38	
Västernorrland	0,35	
Jämtland	0,33	
Västerbotten	0,33	
Norrbottn	0,33	

Table 1 - In this table the remaining factors are presented after removing metro, tram, ship and one third of the bus trips.

2 Literature study

There are several reports in this field where deregulated markets and organizations behind public transport have been investigated.

Fiorio., V. Et. Al. (2013) has shown that user satisfaction within public transport at a monopolistic, integrated service organization was correlated with higher user satisfaction. This finding was statistically significant and implements that the more deregulated public transport there is; the more confusion and unsatisfied users there will be. Back in the year 2003 in Sweden it was decided to call for a parliamentary committee to implement an investigation of the public transport in Sweden (Kollektivtrafikkommittén, 2003). They stated that a general freedom for commercial operators to conduct local and regional services has more disadvantages than advantages and is likely to result in an overall lower transport provision. The system as it was in the year 2003, where the PTA in practice has the sole right to public passenger transport, should be maintained. However, it was desirable to create space for new solutions.

Furthermore, there are many thought regarding the ticket system in public transport. Jonsson (2013) means that there are good an example of ticket system solutions between counties in parts of Sweden, but the country is missing a national unit competitively neutral performs this service. In England there is a company called Association of Train Operating Companies (ATOC) that was set up after privatization in 1993. ATOC gathers all train companies into one system that allocates money between train operators and makes it easier for passengers to find the nearest route with the associated price (ATOC, 2014). According to the Swedish government and Elmsäter-Svård ATOC is often pointed out as a good example of successful ticket systems in context where the current system is insufficient when I comes to handle the interregional travel pattern that increases in Sweden. Therefore the Swedish government has commenced an investigation if there is reason to regulate it to be mandatory for public transport companies to provide data that allows building systems for information, booking and ticketing of public transport journeys (Regeringen, 2014). Another example of a deregulated market with a unified ticket system is E-ticketing in Netherlands (EMTA, 2009). Netherlands has implemented a nationwide system where all passengers have a personalized card with their photo on and it will give access to any transport in the country. The factors for succeeding with such a project according to European Metropolitan Transport Authorities are listed as:

1. Strict coordination of the whole exercise with many parties involved
2. Market the system right from the beginning and do not give customer false information.
3. Keep it simple for the customer
4. Copy and buy an already working system

5. Take a joint project approach.

In this report the financial part of the public transport will be discussed in detail. However it is important to remember that the public transport is striving towards other goals than the finances (Svensk Kollektivtrafik, 2014). Svensk Kollektivtrafik has stated 9 goals that the public transport should work with but also is a strong contributor to:

1. A just society

Many people are dependent of the public transport and one third of the population in Sweden has the public transport as the only option for traveling.

2. Increased Growth

The public transport has a great influence on the national economics because of its big matter when it comes to commuting towards work and school.

3. Employment Growth

People can live where they want and still have a travel option for work, which will increase the opportunity for unemployed to get a job.

4. Greater Equality

It is more women than men travel with public transport, and expanded public transport will increase the availability for both women and men.

5. Expanded labor market

Companies can look for the right people further away from the location of the job because of an expanded public transport.

6. Better health

Researches in the field tell that people that are travelling with public transport are moving approximately four times as much as people travelling with car do.

7. Better environment

Public transport have less effect on the environment than the car.

8. Better urban planning with the human in the center

Public transport requires less space than many cars.

9. Increased traffic safety

It is according to the statistics eight times safer to travel by public transport than by car.

3 The regional public transport in Sweden

“Public transport should be a natural part of a sustainable society” is the vision for public transport in Sweden for the project where the market share of public transport should be doubled to year 2020 compared to year 2006 (Fördubbling, 2014).

With many reports where it is easy to tell that a greater market share of public transport has a direct influence on decreasing market share of car users, many politicians are working for a sustainable society including public transport. It can be seen that the development of public transport is different across the country by looking at data in the form of cost, coverage, travel behavior, increased use of public transport, etc. Sweden as a whole has a different view of developing the public transport in different parts of Sweden. There are many different solutions that from the beginning seems to be the best suitable solution for that region, but turns out as the region grows it doesn't fit with other regions.

3.1 Twofold increase of public transport share in Sweden

The doubling project is a project that is being conducted by the Swedish Public Transport Association, the Swedish Bus and Coach Federation (BR), the Swedish Taxi Association, the Association of Swedish Train Operating Companies, the Swedish Association of Local Authorities and Regions (SALAR) and the Swedish Transport Administration (Fördubbling, 2014).

With this project it is intended to gain:

- Growth and regional development
- A reduction in carbon dioxide emissions from passenger traffic by more than 20 percent
- Increased road safety
- Less congestion
- A more gender equal transport

The project should work as a motivation for the regional public transport authorities as well as anyone in the public transport sector. One work in the line with the intended task is a new process when working on an arrangement between companies in the sector. It is stated that the need for increased cooperation is big and critical if it should be possible to increase the market share of public transport (Fördubbling, 2014).

3.2 Deregulation of railway and public transport as whole

When someone decides to travel by public transport they need to purchase a ticket and it is not very rare that the journey includes a few transfers between different companies. It can quickly become difficult for the traveler if one journey needs more than one ticket and

imaginable support that might be needed can only be provided by the current transport company it is easy to get stuck in-between the system where no one takes the responsibility.

From the beginning of year 2010 it is free to open commercial train companies in Sweden after a full deregulation. Since year 2012 a new law was implemented regarding the public transport system in Sweden. Basically the new law says that the market is free for any commercial company to start a public transport business in an area and there is no longer any monopoly on the market. The idea behind this is to get more companies in the public transport market and increase the competition as the travelers get more options in their traveling as well as lower price for a ticket as a consequence of the increased competition (Trafikanalys, 2013).

According to Region Skåne (2012) some of the important notes on the new law can be summarized as:

- Regional public transportation authorities (RPTA) will now replace the old public transport authorities, so called PTAs.
- The RPTA will make decisions regarding the regional traffic development plan as well as a public service obligation.
- Public transport companies can now start a commercial business anywhere in the country.
- Even commercial companies have to report their information regarding their transport supply to a joint system.

For a new company to enter a new market that has been within the public sector and funded by taxes, there has to be some sort of cost coverage. There are no reasons for a company in any business to put time into something unrewarding in short and/or in long terms. This part is difficult in the public transport sector since authorities in Sweden want people to use public transport instead of cars to save the environment, for example, in that matter the price for a ticket should not be too high (Trafikanalys, 2013a).

The reality today after two deregulations is that the railway market is showing some opening and in 2014 there will be a competition on one of the most lucrative stretches in Sweden, Stockholm – Gothenburg. In the bus sector of public transport on the other hand, there are no signs of major changes after the law 2012 (Trafikanalys, 2013a). Even if companies know that it is possible to start a new business, there is rarely anyone that wants to do this. The major reason for this seems to be that the subsidized traffic has long contracts over many years and to start a business in direct rivalry with those will not gain any profit.

3.3 Samtrafiken

As mentioned before the increasing number of transport companies can be a burden for the traveler but there exist some projects that in Sweden that tries to coordinate these companies in Sweden.

In Sweden there is one organization called Samtrafiken that has the task to simplify the journey for the traveler when travelling with at least two different companies (Samtrafiken, 2014). This is done by the service within Samtrafiken called Resplus. Resplus gives the traveler some guarantees when travelling with different companies. For example, is the company responsible for an eventual delay beholden to refund the ticket if the traveler gets more than 60 minutes late to their final destination (Samtrafiken, 2013).

Samtrafiken consists of 36 transport companies in Sweden and the idea is that Samtrafiken gets a small fare of each ticket purchase depending on the volume of sales. The greater sales volume of ticket is the lower percentage of moneys goes to Samtrafiken (Samtrafiken, 2014). Transport companies want to be included here to give the traveler some guarantees that he or she will get to their destinations regardless of possible delays before or after transfer between different companies.

Samtrafiken does not provide any sale of tickets and lean on the sell from the different companies within Samtrafiken (Samtrafiken, 2014). The supply differs from different distributive traders but if the companies are included in Resplus and the journey includes at least one exchange between different transport companies the traveler can be certain that the ticket is valid for the travel qualifications stated by Resplus (Samtrafiken, 2013).

3.4 Transportation goals

When studying a region and the travel within, one important note is how well the public transport authorities are trying to coordinate themselves towards the regional goals. The regional goals on the other hand should somewhat agree with the national goals other than that a different goal might be needed in order to reach for something bigger. The most general goals for transportation in Sweden are the ones on a national level and are handed out by the government, Regeringskansliet (2014):

“The transport policy objectives

The overall goal of Swedish transport policy is to ensure a national economically efficient and sustainable transport for citizens and businesses throughout the country.”

Under the overall goal, the government has also set up functional objective and deference objectives in a number of priority areas. The deference objectives include safety, environment and health (Regeringskansliet, 2014). Furthermore, this is split up into reducing the number of deaths and injured in traffic and also reducing the number of depending

vehicles of fossil fuels. The functional goal includes accessibility, quality and equality. Within the functional objectives, there is one part close to this thesis that is stated:

“Accessibility will be improved within and between regions, and between Sweden and other countries”

To connect the regional goals with the national goals is important in striving for consistency and since the new law³ in the year 2012 every county has to clearly state goals for the county in their traffic development plan (Riksdagen, 2010).

³ Law (2010:1065) about public transport in Sweden

4 Choice of methodology



Figure 2 - Research design

4.1 Identify and define the problem

The regional public transport grows in Sweden as the regions around the cities grow. People live outside the city center because of high real-estate prices and closeness to nature, etc. This requires good transportation options between home, work and leisure. As the transportation gets better the region grows even more and the regional expansion is highly dependent on the public transport.

The problem today is difficulties regarding the ticket system. Not only do regions consist of many counties with different prices within the county, the deregulated railway market leads to many different transport companies in the same area. To some extent these companies need to coordinate their work. This thesis is due to map the organizations in different regions in Sweden in order to see if some are more successful than others and find the reason why.

4.2 Create a model

The three different sections of the model are characteristics, indicators and problems. The characteristics are example on how the situation with public transport within the examined region looks today. It is confirmed facts about the conditions in a region rather than any analysis. The indicators, on the other hand, are a measure of how public transport in the area is performing, whereas the problems are analyzed statements from the characteristics and indicators to detect patterns with similarities and differences between the regions. Characteristics build the foundation for the region and these statistics will lead to indicators and point out problems in the model.

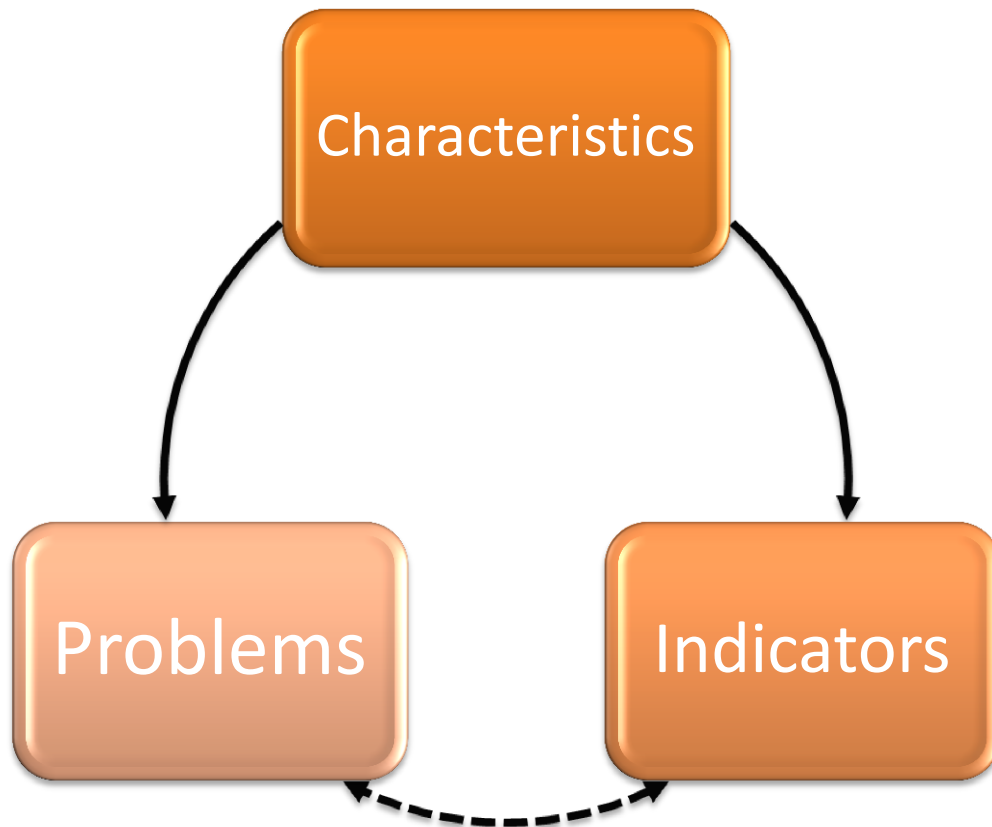


Figure 3 - Model for introducing the different regions in order to compare them. Characteristics in a region give indicators and problems and in some cases indicators could imply problems and vice versa. This model maps the region's typical properties and creates patterns in statistics that can be analyzed further.

4.2.1 Examples of characteristics

Characteristics are non-analyzed fact from each region in order to give a good idea of how the public transport works today. Properties like cost, revenues, population and taxes can say a lot about how the region works today.

Population within a region is important to understand the size of the cities and travel behavior. There are more trips generated in a region where there are lots of people, but the percentage will correct for this. However the population is a good indicator of the region's popularity.

Density (Inhabitants per square kilometer): It is well-known that more dense urban areas tend to walk, bicycle and/or use public transport in a greater matter than less dense places. It is easier to cover a region with high density with bus lines than it is to cover all inhabitants in a less dense area.

Traffic cost per vehicle kilometer is a characteristic that tells how much the actually carried traffic in a region costs per kilometer. High costs need higher ticket prices or more subsidies or many travelers.

Traffic revenues per vehicle kilometer are a measure of how much each region earns in revenues per actually performed kilometer of traffic.

Tax contribution per capita is an average cost where the total tax money spent on public transport is divided by the total number of inhabitants in the region. This is a good measure when assuming that public transport will cost more if there are bigger populations and this is covered with this characteristic. Tax money per capita gives on average a value of how much each region is spent on public transport per inhabitant in kronor.

These characteristics will lead to problems and indicators. Indicators are consequences from certain characteristics.

4.2.2 Examples of indicators

Indicators are an analyzed development taken of the characteristics. If the characteristics tell something about the general situation in the region today, the indicators tell how efficient the regions are, both in terms of economics and public transport market share. The chosen indicators are all represented as important in Svensk Kollektivtrafik and Trafikanalys.

Cost coverage is the percentages of the cost of providing public transport that is generated by ticket revenues from the transport companies. This indicator alone just tells whether the transport line is lucrative, but it needs to be supplemented by market shares etc. to get a bigger picture.

The public transport share is one of the most powerful indicators itself. There is a lot of focus on increasing the market share of public transport today which will help save the environment if the new public transport user is a former car user. One must beware that one traveler leaving their bicycle for public transport won't benefit to the environment or contribute to the society in an economic matter.

The net cost per vehicle kilometer is calculated by subtracting the revenues per vehicle kilometer with the cost for the same. What's left after the subtraction is a net cost that is a measure of how cost efficient each executed kilometer of public transport is.

Number of trips (Number of passengers boarding): Another indicator for how well used the transport system is. Number of boarding passengers often equated number of trips in a region.

4.2.3 The problems within a region

Low cost coverage: If one region generating high market share in public transport, but low cost coverage, the problems within this region lies within the economical part⁴.

⁴ The discussion whether it is worth having high costs in order to generate more trips with public transport are left out in this indicator. The optimal region has both high travelling and good economics.

Low public transport shares: On the other hand the economics of the region when it comes to public transport may be very good but the usage of the system is low. Then the problem for this region lies within the public transport usage.

4.3 Data gathering

4.3.1 Literature review

This work is done by investigating the situation today by researching reports and books. The regional traffic development plans give a good idea of commuting today and overall goals for each region. The idea is to give a good first introduction to the traveling within the region before presenting the organization structure and the statistics for all regions in order to compare characteristics and indicators for each region.

4.3.2 Interviews

With this general public material regarding travelling inside each region the next step is to interview experienced people working with the public transport in each region in order to map the organizations behind these numbers. The overall goal with the interview is to understand how each region is working with the coordination of several transportation companies performing business in the same region. This material will focus on how the organizations are working with the regional public transport in the different regions. The information presented in this section is collected from interviews with active or former workers from primary companies or regional public transport authorities in each region. Their background differs, but all of them have a lot of knowledge about these organizations through experience in the field.

4.4 Method for analysis and conclusion

After getting a good picture of how it looks today this material leads to findings that need to be analyzed in order to be able to draw conclusions from the traveling within each region. The analysis section of this report will adapt the model onto every region in this project for further analyze. The analysis also includes correlation analyze to investigate detected patterns from the model.

The last step includes connecting the chosen path for handling these questions in all organizations respectively in order to come up with an optimal way of eliminating the boundaries within public transportation to increase the market share for people leaving the car at home in favor for public transport.

5 Successful integration of regional public transport

The organization within the public transport sector has a great responsibility for developing an attractive alternative for the car users. The more companies there are on the market as a consequence of a deregulated market the more complex it might be for the user. It is up to the organizations in Sweden to ensure that the reliability and efficiency remain within public transport. A commercial company wants to travel at their terms in order to earn money, and without the regional public transport authorities there is no one that preserves the county's interest. Therefore the organizations have the power to ensure efficiency against non-optimal solution by cooperating. To understand how it might look between cities in counties there are figures below that shows two possible scenarios.

First off, when a commuter starts to travel by public transport (PT) the expectation is that the new user of PT is a former commuter with the car. If for example a person usually travelling by bicycle starts to commute with public transport the economic gain in the region isn't as big as if the user gave up the car.

What problems can occur when many different companies operates in the same area?

The situation within a county can be very different from place to place in Sweden. If the commuting is lucrative it may happen that two rival companies transport people between the same cities at similar times. What happens in these cases is that these companies share the same market of commuters and the total gain is divided between them.

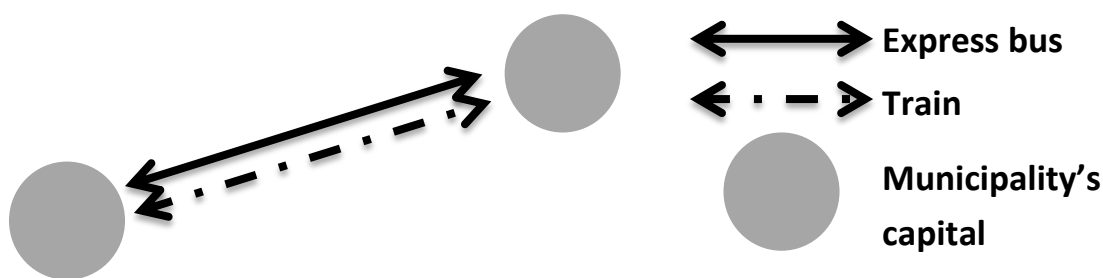


Figure 4 - Figurative picture of inefficient public transport within a county

In Figure 3 there are two municipality capitals where two companies only focus on transporting customers between these two bigger cities because this is the most lucrative route. When two equal alternatives in travel time get the traveler to choose between buses or train the split between each mode will highly depend on the ticket price (Hergesell, A. & Dickinger, A., 2013). This will gain a sub-optimized travel segment where two companies take customers from each other's and smaller conurbations and suburbs will suffer from the lack of holistic thinking. It is not the fact that there are buses and trains along the same stretch that is the problem; it is the fact that two or more companies transport people at the

same times. The need for a neutral organization that controls the public transport is great in order to optimize the share between the companies.

What is most optimal, is when express bus or train transport between the largest cities in the county and regional buses cover the smaller neighborhoods along the main stretch. Then close to the greatest cities in the county it is optimal that local buses cover that area (Örebro läns landsting, 2012).

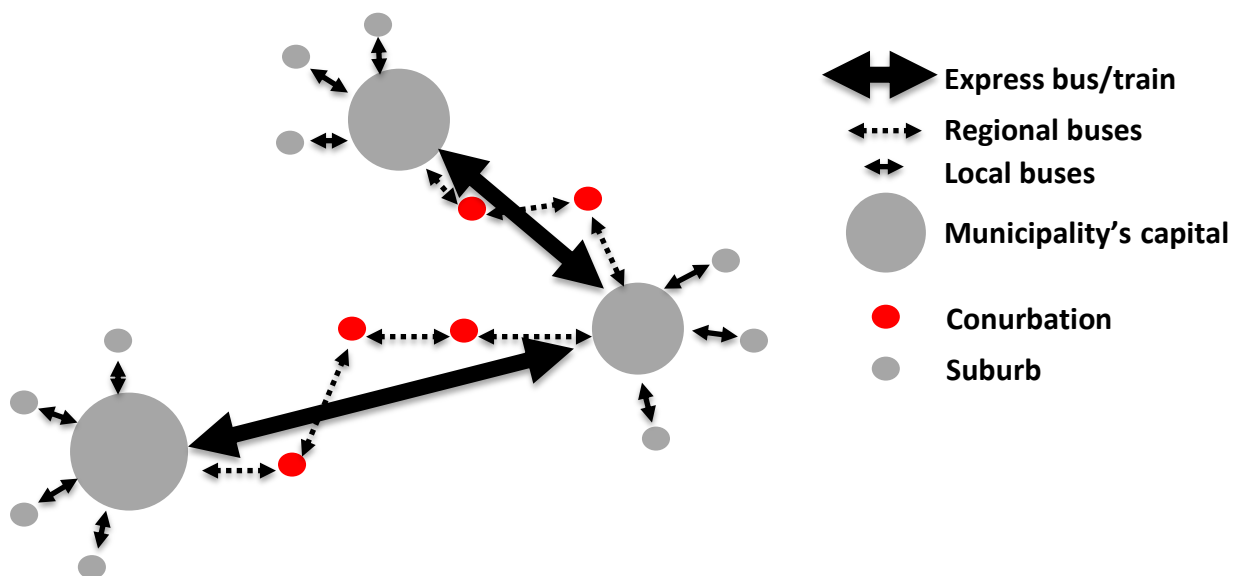
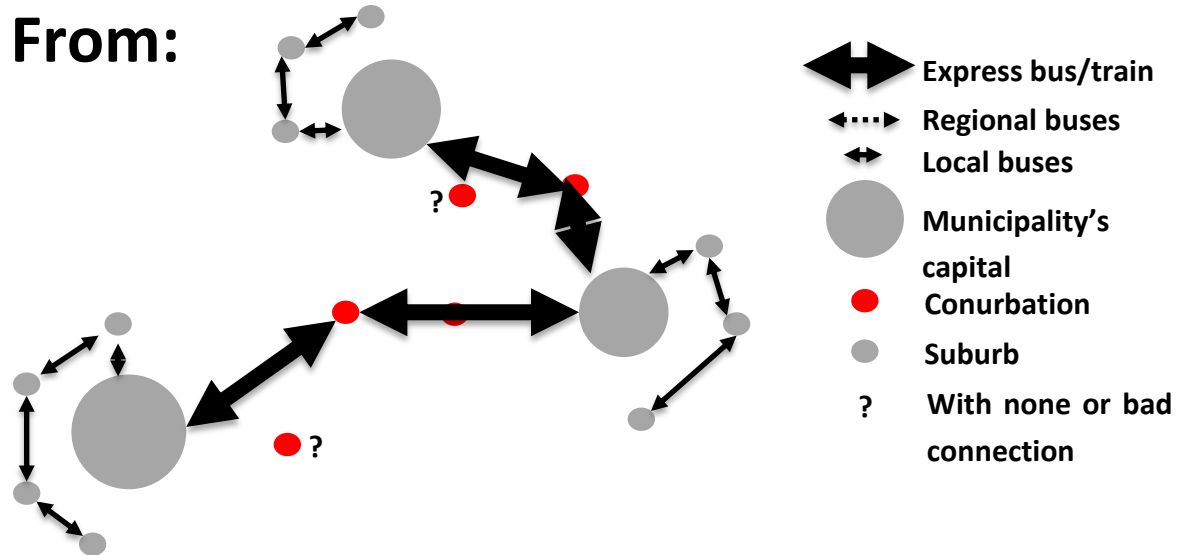


Figure 5 - Figurative picture of efficient public transport between local bigger cities in counties (Örebro läns landsting, 2012).

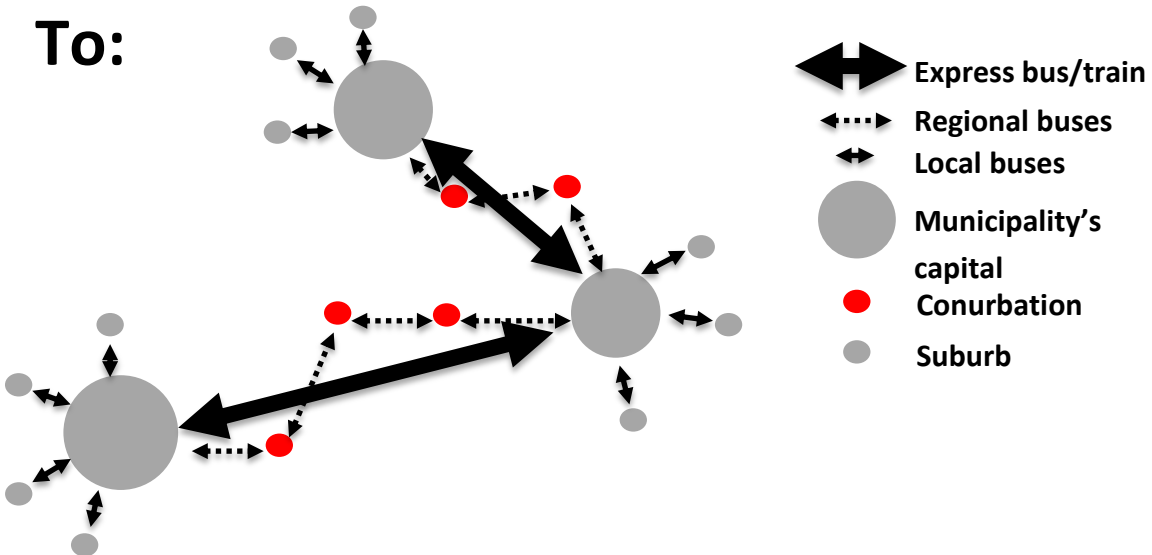
Furthermore the optimal solution for the traveler should include an integrated tax system where one ticket is enough for any choice of transportation mode within public transport (Örebro läns landsting, 2012). Another aspect in the planning is the time schedule. Especially in greater cities with large amount of commuters travelling to and from the city the distance from the station to the connecting bus need to be kept short and the waiting time should be as small as possible.

To summarize the successful region, it is first of all important to go:

From:



To:



With:

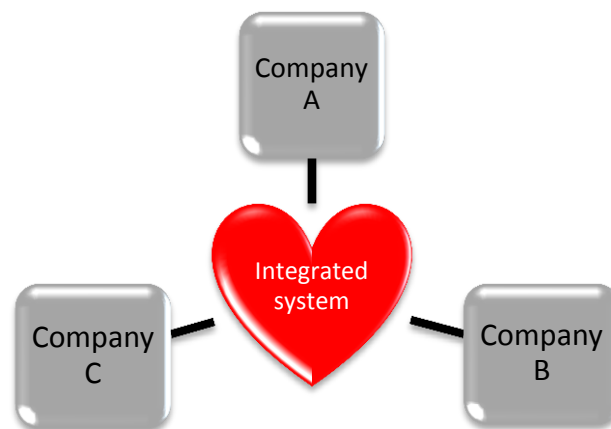


Figure 6 - A figurative way of integrating the system and optimize the public transport inside a region (Örebro läns landsting, 2012).

When the system is integrated and the public transport service is optimized a successful region reach out to the inhabitants and increases the public transport market share by letting everyone know about the reliability and advantages of public transport. The goal here is not to remove the car from transportation, but to give an alternative to avoid unnecessary trips with a less environmentally friendly alternative. Regions need to develop the public transport and allow it to cost money and time in its development.

6 Regions

The different regions in this report are presented below. They all proceed from a clearly stated cooperation between the counties regarding the regional public transport, and further investigations will give more details regarding how well the region works with the public transport within them.

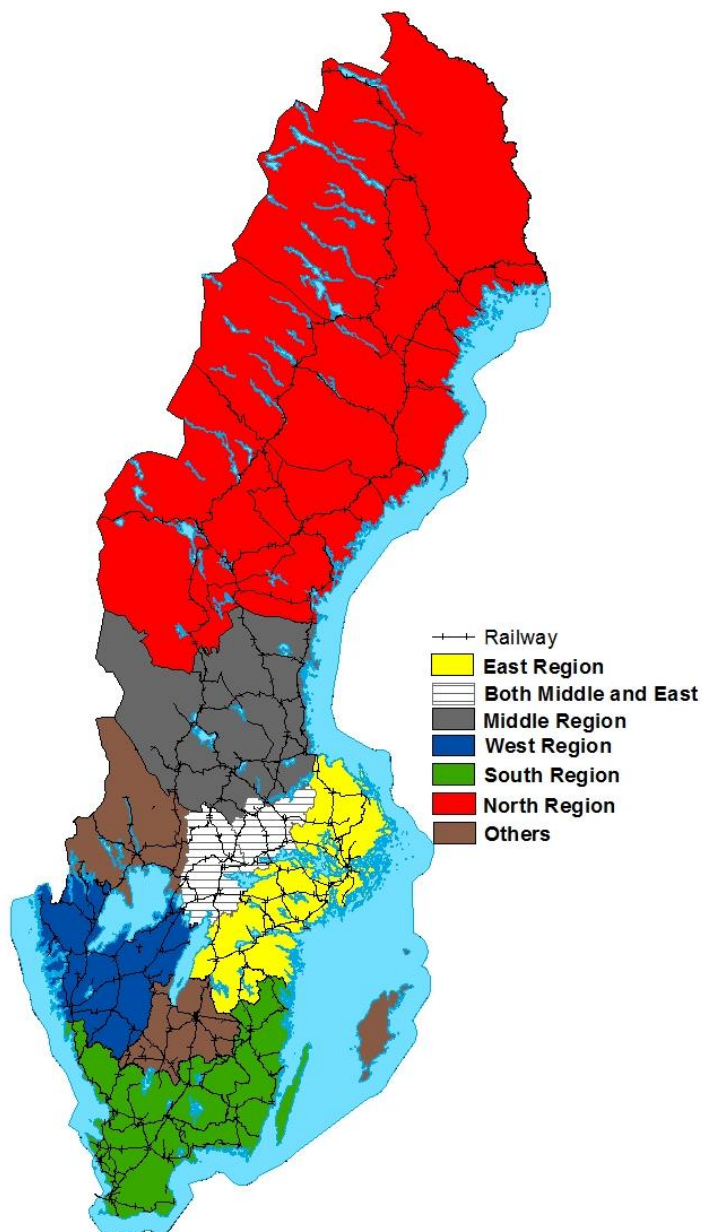


Figure 7 - Map of Sweden, where each region in this thesis is highlighted in different colors.

In figure 7 the different regions are represented. In the far north the largest region is represented named the North region (marked in red) which covers a large area in square meters but few inhabitants. As can be viewed in the figure the striped area includes two counties, Örebro and Västmanland. These two counties have an agreement with both Trafik i Mälardalen and Tåg i Bergslagen. The gray area is called the middle region. The yellow area is the east region where Stockholm, the capital of Sweden, is located. This region has the fastest growth in population. The blue zone is the western region, which includes the second largest city in Sweden, Gothenburg. The green area covers the south region where the third largest city in Sweden can be found namely Malmö. This region stands out for having large differences from county to county where some of the counties got the highest cost coverage rate in Sweden and one has one of the lowest. The brown area is a bit

different from the regions named before and is called others. This is because of different reasons they are hard to connect to one of the other regions. These different parts of Sweden marked in brown will not be presented in the project below and therefore not further investigated for the analysis section.

6.1 North Region

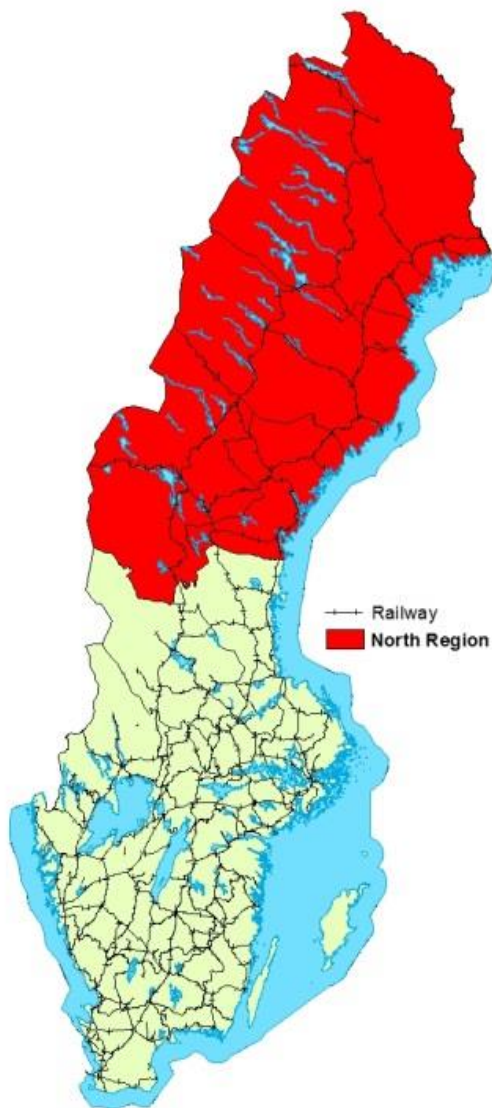


Figure 8 - Map of Sweden, where the red highlighted area marks the northern region.

The northern region is geographically a very large area compared to the rest of the regions this report is going to cover, but when looking at the inhabitants of Sweden there are much less people living in the northern part than in the south (Regionfakta, 2014).

The northern region consists of Norrbotten, Västerbotten, Jämtland and Västernorrland County. The north region differs from other places in a way where there are few people in a large area (Regionfakta, 2014). With few bigger cities, this region gets a widely spread population that commutes long stretches. The main operating accommodation train company in the northern region is Norrtåg. The railway track is mainly located a few miles into the country along the east coast, meanwhile the inhabitants are close to the east coast.

There are several larger commuting stretches in the north region and these start from Östersund to Sundsvall and continue via Umeå along the east coast to Skellefteå and Luleå. As can be read above the northern region is very large if measured in square meters and, for example, do 1-2 % of the population in Sweden live in Jämtland and the county covers 12 % of the Swedish land area according to Ericsson⁵. This

condition creates an extremely difficult situation to provide public transport for all inhabitants in the county. On the other hand, concentrated on the east coast, the population density is just as high as the other regions, which can be viewed in table 2 below (SCB, 2013). In the northern region the county of Jämtland chose not to be involved in the national doubling project because of weak economy⁵ (Ericsson, 2014). The other counties are included in the doubling project and joint goals for the region is to over bridge long distances and provide for long term sustainable public transport according to their traffic development plan. The northern region has a high traveler satisfaction in public transport even though

⁵ Ruth Ericsson, public transport strategist in Jämtland. Telephone interview 15th April 2014.

there are fewer people travelling in this region compared to the other regions in this thesis (Svensk Kollektivtrafik, 2012).

The strongest train line and mostly used according to Thörnberg⁶ is the Bothnia Line. This railway is located between Umeå and Örnsköldsvik and increased the public transport share remarkably. Because of the case where the inhabitants live close to the east coast this relatively new open railway connected the inhabitants and gave a good opportunity from a situation where the old railway is laying further into the country. There are also under discussion of opening a North Bothnia Line from Umeå via Skellefteå and Piteå to Luleå to adjust the railway even more to where people live and decrease the travel time and cost (Norrbottenregionen, 2014).

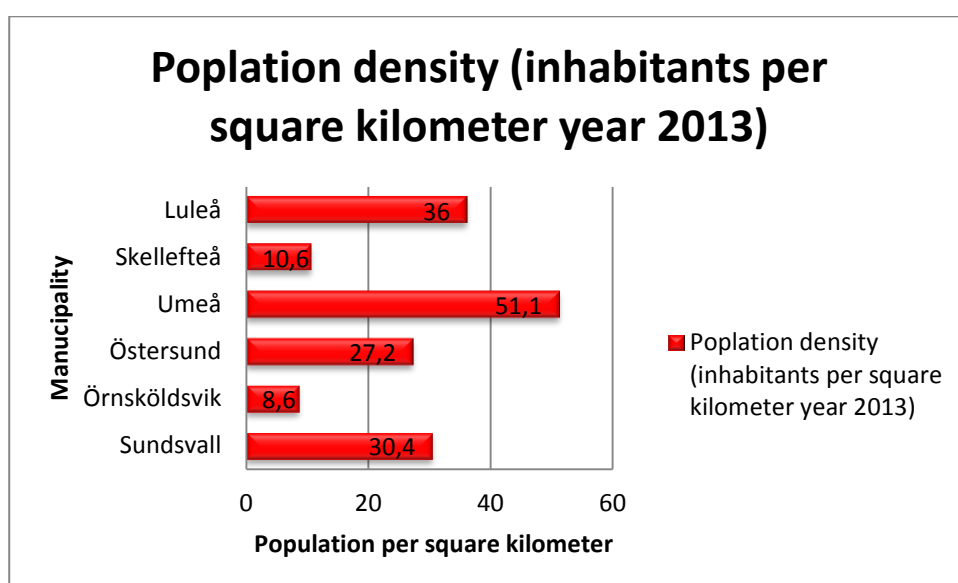


Table 2 - Population density in municipalities in the north region where most of the people live (SCB, 2013).

When looking at the satisfaction among the users in the region regarding the public transport it is notable that the highest number in Sweden is found in Norrbotten County with 83 %. This gives the region an average satisfaction of 72 %, which is 11 percent points above the national value. Notable is that Jämtland didn't participate in the statistics and is therefore excluded from the table.

⁶ Heidi Thörnberg, Head of public transport authorities in Västerbotten. Telephone interview 14th April 2014.

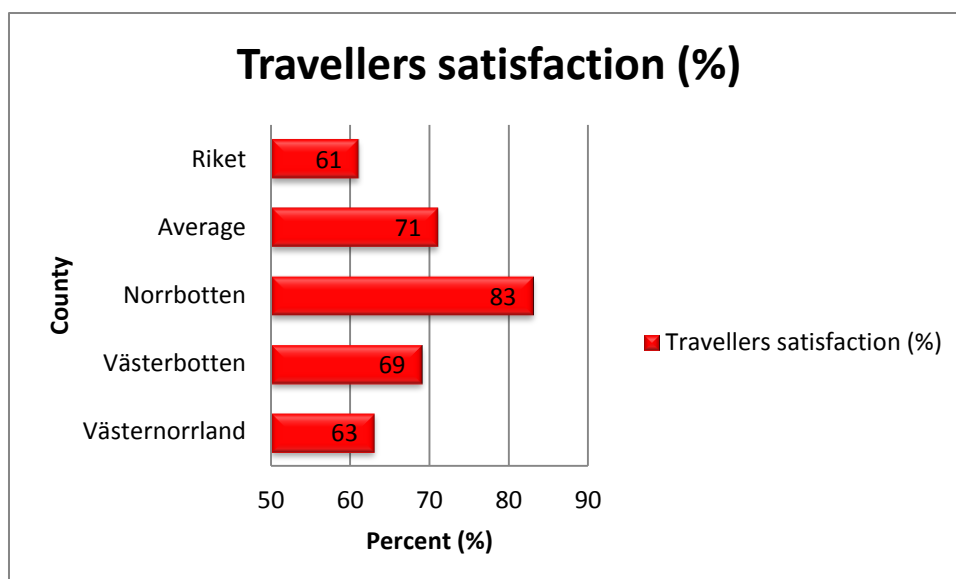


Table 3 - Public transport users' satisfaction in percent from year 2013 in the north region (Svensk Kollektivtrafik, 2013).

6.1.1 North Region organization

The north region is represented by Olle Tiderman managing director of Norrtåg, Ruth Ericsson public transport strategist at the regional public transport authorities in Jämtland and Heidi Thörnberg head of public transport authorities in Västerbotten.

Norrtåg is owned by the regional public transport authorities in Västernorrland and Norrbotten together with public transport operators within Jämtland and Västerbotten (Norrtåg, 2014). Financially, these four counties subsidize the part that's not being covered by the ticket revenues from Botnietåg. Botnietåg is assigned to operate the trains for Norrtåg. They have all the contact with the customers and provide ticket information, etc. Botnietåg on the other hand is owned by Arriva Sweden and SJ AB.

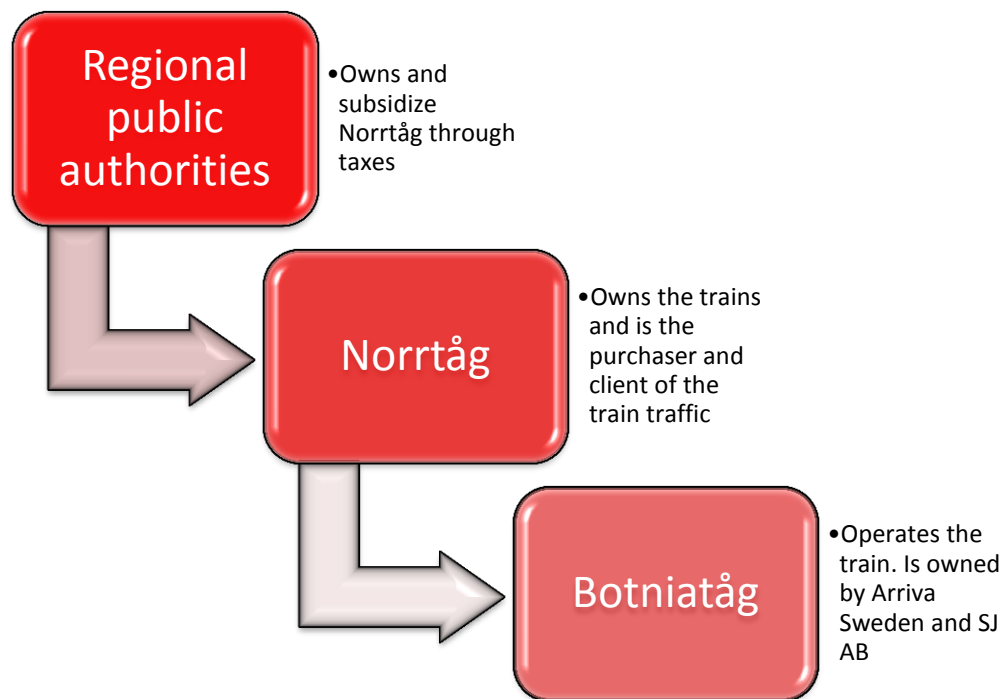


Figure 9 - The public transport organization in the north region

Goals for the organization

By erasing the county boundaries and creating an attractive public transport, the northern region wants to gain regional expansion and sustainable growth.

Who orders the traffic and who is financing?

Norrtåg is purchasing the traffic and orders where it should be going by, among other things, take in orders from the county council. The four owners, which are represented by each county, are subsidizing the part which is not covered by ticket revenues.

Ticket system

There are four levels of ticket system. They have something called a service concession where the operator sets prices and manage sales and which, with some exceptions allowing commutation ticket for commuters within the counties.

In the northern region they have Norrlandresan as a ticket system. Every county has a model within the county that is a mileage-based tariff that costs more per mile if the journey is short.

The operator takes a bigger risk by deciding the ticket prices themselves and takes the proceeds themselves, a so called gross agreement.

Vehicle Pool

Counties leases through Transitio which is owned by the counties, this represents Norrtåg vehicle division. Counties vouch for trains and Norrtåg have a rental agreement with them, and the operator has in turn a rental agreement with Norrtåg. The operator has free access to the vehicles and also maintenance requirements themselves.

Norrtåg as organization, what is the main job assignment?

As a jointly owned company of four counties, the main task is to gather information about the counties need and allocated the revenues among the owners. In order to gain these revenues Norrtåg assigned the operating task to Botniatåg. In other words Norrtåg acts as intermediary for developing the northern public transport.

6.2 Middle Region

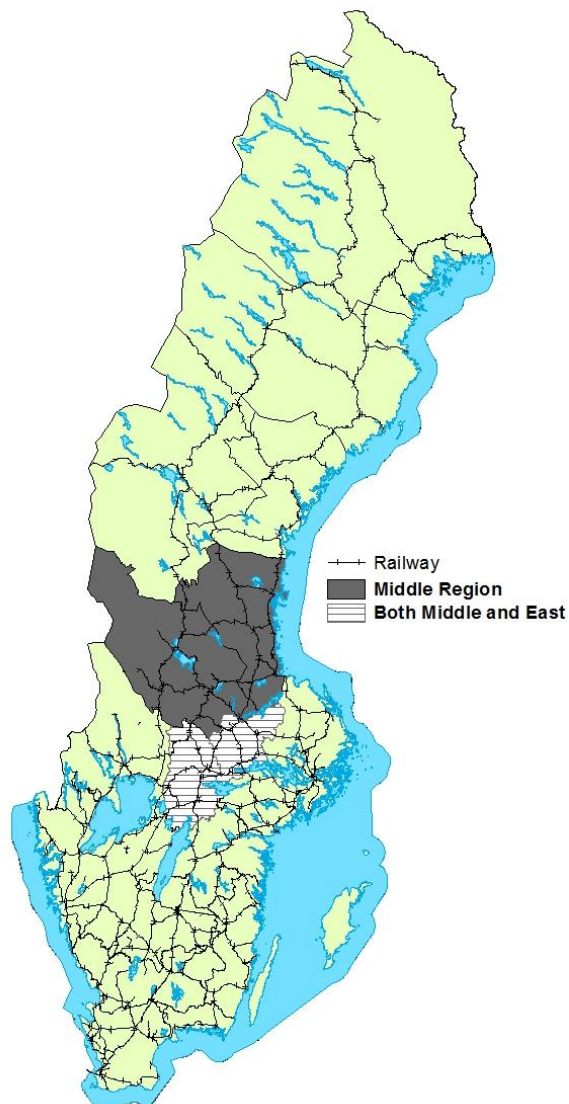


Figure 10 - Map of Sweden, where the gray-colored surface marks the middle region.

examples in this region of places with the lowest property prices in Sweden but are slightly increasing after the development of Tåg i Bergslagen (TiB). Furthermore, there are challenges in Dalarna County, which is one of the most car dense counties in Sweden with a deep-seated car tradition (Oljemark, 2014).

Bergslagen is located in the middle of Sweden and makes the middle region. The largest train operator is Tågkompaniet. SJ operates Västerås-Sala and Sala to Mora and Tågkompaniet and SJ also share the same stretch north of Gävle to Sundsvall and Ljusdal respectively. Otherwise, this area is mainly operated by Tågkompaniet (Tågkompaniet, 2014).

The middle region consists of Dalarna, Gävleborg, Örebro and Västmanland County, whereas Örebro and Västmanland are included in both the middle region and the east region. Worth knowing about these two counties is that they are part-owner in Tåg i Bergslagen with 25 % each, whereas they are included in MÄLAB with a lower percentage and has much less to say about the traffic in the east region than in the middle region. The commuting is mostly concentrated around three bigger cities in the region, namely Örebro, Gävle and Västerås.

This regional train system is with exception from Norrtåg, one of the most recent established systems in the year 2001 (Fröidh, 2014). According to Oljemark⁷ there are

⁷ Hugo Oljemark. Managing director of Tåg i Bergslagen AB. Interview with H, Oljemark 15th April 2014.) Telephone interview.

By looking at the traveler satisfaction there is an average of 66 % of the public transport users that are satisfied with the public transport in the middle region, which is 5 percentage points above the national value on 61 %.

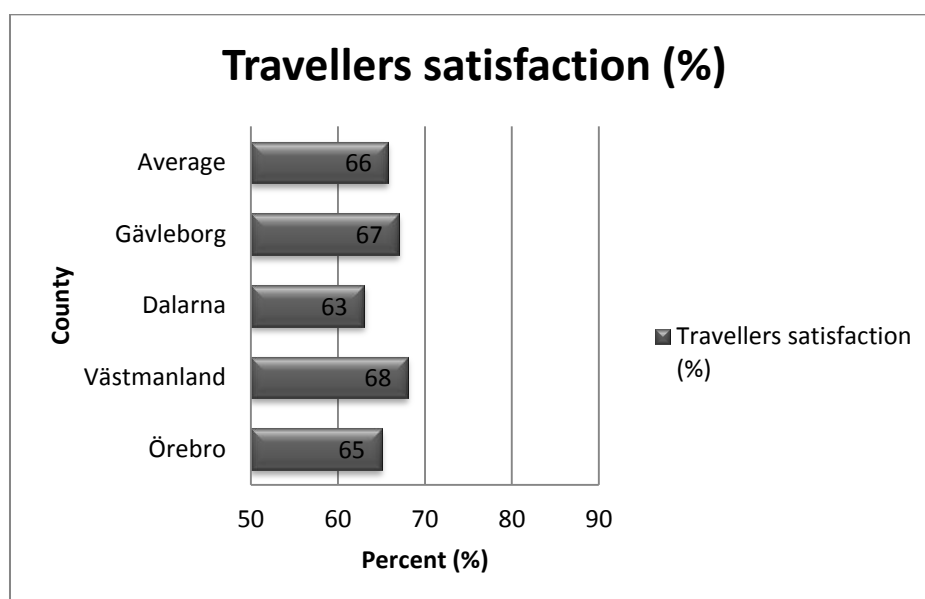


Table 4 - Public transport users' satisfaction in percent from year 2013 in the middle region (Svensk Kollektivtrafik, 2013).

6.2.1 Middle Region Organization

The middle region is represented by Hugo Oljemark, managing director for Tåg i Bergslagen.

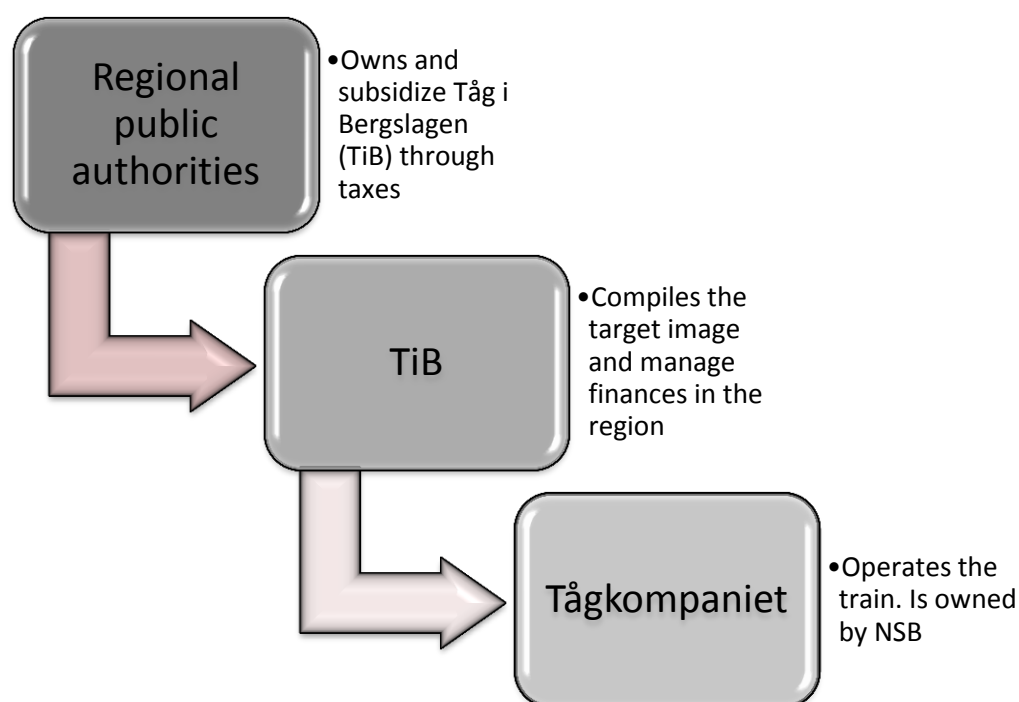


Figure 11 - The public transport organization in the middle region.

The main mission is to accommodate work and school commuting. There are, for example, smaller varieties which had the lowest property prices in Sweden and by establishing regional public transport a slight increase can be seen. In collaboration with the Swedish Transport Administration TiB work in order to improve the infrastructure in the region and searching for improvements like having trains meeting at a station to combine train meeting with traveler exchange.

Goals for the organization

- Flourishing Region
- Increase travel
- Allow for flexible labor markets

Ticket system

The project to procure a new ticketing system (BIMS) started in 2003. The overall goal was a unified ticketing and payment systems for eight PTAs; X-Traffic, Train in Bergslagen, Dalatrafik, regional buses, Västmanland Public Transport, Länstrafiken Örebro, Karlstadsbuss and Värmlandstrafik. It does not work right now on the trains, but it will be implemented in September.

The travels across counties have Tågkompaniet reserved rights to. TiB will be those who try out cross county borders commutation ticket.

Who orders the traffic and who is financing?

TiB orders the intended traffic, and are funded through the four counties. The ticket sales through the commutation tickets and single tickets are a little more than 50-54% of total cost coverage, TiB receive approximately 12% of the former national traffic⁸ and the 35 % deficit is financed by the county councils.

Tågkompaniet receive all revenues from ticket sales and over a certain amount that is approximately 100 million, Tågkompaniet and TiB shares half each.

Vehicle Pool

The counties have leased their trains via Transitio. TiB pays a rent to Transitio. The rent is a depreciation rate and heavy maintenance and administration, which then allows TiB to avoid having vehicle management.

⁸ A body that gave out grants to regional services. Nowadays, this lays within the Transport Administration in Sweden.

TiB AB as an organization, what is your main job assignment?

Ensures that Tågkompaniet is following defined goals, and pays their bills and allocate the costs among the counties. TiB is the way into the four counties to involve them.

Tågkompaniet sell tickets, ensures that the trains have staff, performing maintenance (via EUROMAINT Gävle) and together, they promote the concept.

6.3 West Region

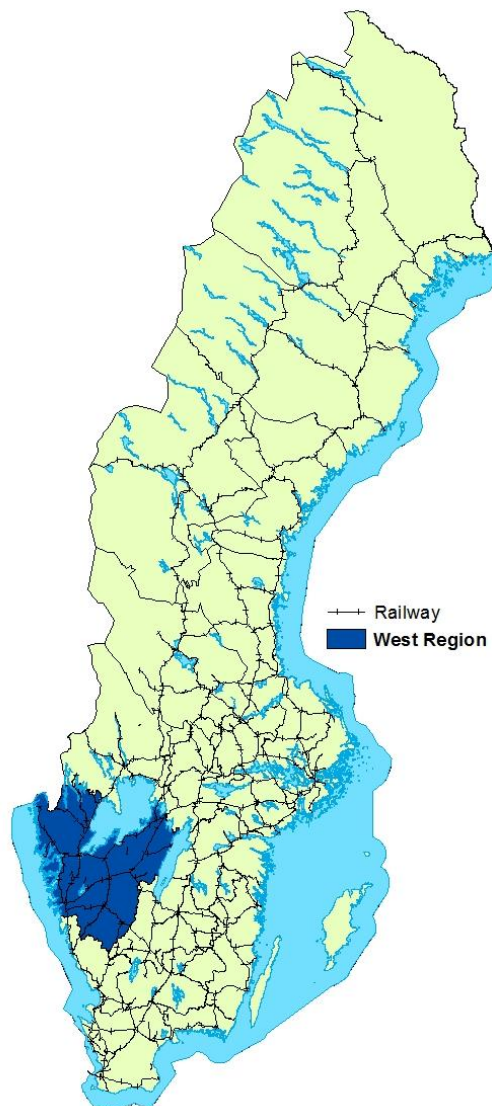


Figure 12 - Map of Sweden where the blue highlighted area marks the west region.

The west region consists of a large county, including the second biggest city in Sweden, Gothenburg and also the northern part of the landscape Halland. This hasn't always been the case before the year 1998 were Västra Götaland three separated counties, namely Göteborg and Bohus, Skaraborg and Älvsborg County. After long discussion regarding difficulties with county borders met in the middle of the metropolitan region around Gothenburg these earlier mentioned counties were combined into one large (Västra Götalandsregionen, 2014b).

The commuting inside the region is highly centralized around Gothenburg where most of the workplaces are located (Västra Götalandsregionen, 2012). Of a total population of 1.6 million people, half of them are settled in Gothenburg. The main railway stretch between Stockholm and Gothenburg has reached its capacity, which leads to difficulties in planning the regional traffic close to Gothenburg (Efraimsson, 2014). If a long distant high-speed train between Stockholm and Gothenburg is applying for a specific spot in the timetable it is up to Trafikverket in Sweden to

decide which train that contributes the most to the national economy.

In these cases the regional public traffic has to make room for the high-speed train which will stunt the regional development⁹.

According to Västra Götalands (2012) traffic development plan the population is more spread than the workspaces which increase the difficulties to provide economically efficient public transport to all of the inhabitants in the region. Further, there are a very small percentage of journeys made



Figure 13 - Percentage of trips made between and inside the four sub-regions in the west region (Västra Götalandsregionen, 2012).

⁹ Efraimsson, J. Investigation leader at Västra Götalandsregionen. Interview 2014-04-04.

between the four bigger sub-regions within Västra Götaland; only 3 % of the total trips made are interregional trips inside the region.

By looking at the satisfaction among the people using the public transportation system there are a low number of people that says there are satisfied with the system as it is today¹⁰. The total percentage of travelers that are satisfied with the public transport is 53 %, and the probable cause of this is said to be the non-user-friendly ticket system. This number is also the lowest of all counties in Sweden.

6.3.1 West Region Organization

The western region is represented by Jan Efraimsson at Västra Götalandsregionen where he is leading investigations in the region about public transport.

In the western region the regional public authorities are kept at the regional association where a special department for public transport beneath the regional board is working with public transportation in the region.

In the western region there are mainly three companies that practice regional train public transport. One of them is SJ, which has come up with an agreement where travelers between Skövde and Gothenburg can travel with SJ with a ticket from Västtrafik. Another company in this region is Öresundståg. They are carrying out regional rail traffic between Varberg and Gothenburg¹¹. The third and largest company in the region is Västtrafik which execute all other traffic in the region. Västtrafik is fully owned by the regional public authorities in the region namely Västra Götalandsregionen. Västra Götalandsregionen is planning the overall goals for the region and decides the future vision regarding public transport. Together with the politicians Västra Götalandsregionen also decides the budget to which Västtrafik has to adjust accordingly. Further, it is Västtrafik that decides where new train stretches should be drawn, where to put new stations and also how much a ticket should cost for the traveler, but they have to adjust according to regional goals and the budget (Västra Götalandsregionen, 2014a).

¹⁰ Compared to the other regions in this thesis.

¹¹ Öresundståg AB has more traffic in other parts of Sweden, especially in the south region.

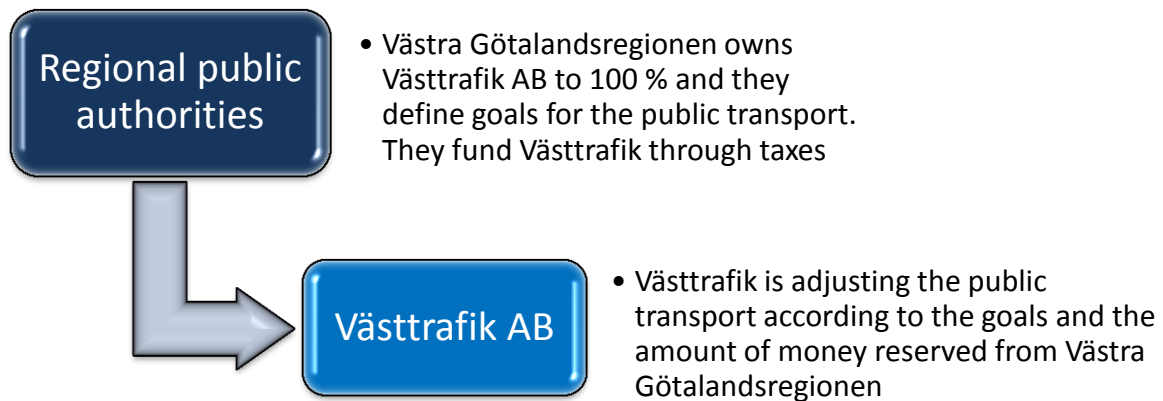


Figure 14 - The connection between the public authorities and the public transport company in the west region.

Goals for the organization

Västra Götalandsregionen has divided the goals into four categories with relative order:

1. A competitive growth area in northern Europe.
2. Triple the travelling by train, by 2035.
3. Develop the traffic in order to be able to handle all new travelers.
4. Expand and upgrade the infrastructure

Who orders the traffic and who is financing?

Västra Götalandsregionen owns Västtrafik to 100 % and as owner they financially support the work and set up long-term goals for Västtrafik. Västtrafik on the other hand adjust their work after these goals and adjust the traffic and vehicle from these conditions.

Ticket system

The ticketing system is a big reason for low traveler satisfaction in the western region. After interviewing 1500 travelers Västtrafik are working with simplifying the ticketing system. Commutation tickets are today allowed on every Västtrafik train, SJ regional and Öresundståg from Kungsbacka. There are a few commercial buses, for example to the airport and SJ high speed trains that are excluded from the commutation ticket but most traffic are covered by this system. Västra Götaland is also a part of Öresundståg AB, whereas the commutation tickets are allowed on their trains in the region.

Vehicle Pool

Some of the vehicles are leased via Transitio and some vehicles are owned by Västtrafik.

Västra Götalandsregionen as organization, what is the main job assignment?

The main job assignment is to define long-term goals for the public transport in the region. Furthermore, the task is to make sure Västtrafik AB follow these goals and look after the finances.

6.4 East region

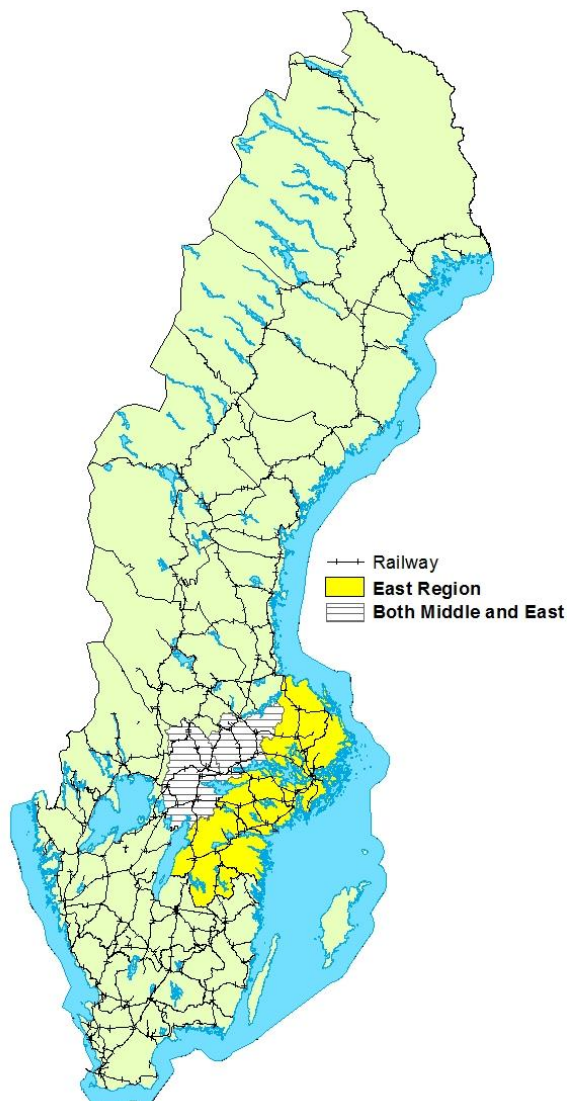


Figure 15 - Map of Sweden where the yellow highlighted area marks the eastern region.

The eastern region consists of five counties around the capital of Sweden, Stockholm. There are Östergötland, Södermanland, Örebro, Västmanland and Uppsala, which all contributes to the growth of Stockholm, and in this region, consisting of 6 counties, lives one third of the total population of Sweden.

Commuting in the eastern region is mainly towards Stockholm. This project aims to research the region itself and a great majority are traveling to and from Stockholm, and in order to catch the regional traveling the local traffic in Stockholm is excluded.

Counties around Stockholm have a lot of railways from Stockholm, passing through the county. In example Södermanland County has no bigger town¹² and in addition, there are four railway tracks which split Södermanland. There are: UVEN which is feeding high speed trains in Katrineholm, Svealand line, Western Main Line and Nyköping Railway. All cities need traffic supplied and this is a challenge

for this county (Bringert, 2014).

The public transport user satisfaction in the region has an average part of 65 %. There are

two notable things about this satisfaction. The first is that Östergötland didn't participate in

¹² Eskilstuna is the largest town in Södermanland and second largest is the county town Nyköping

the statistics, and the second is that Stockholm has a low satisfaction of 58 % but is excluded from this report.

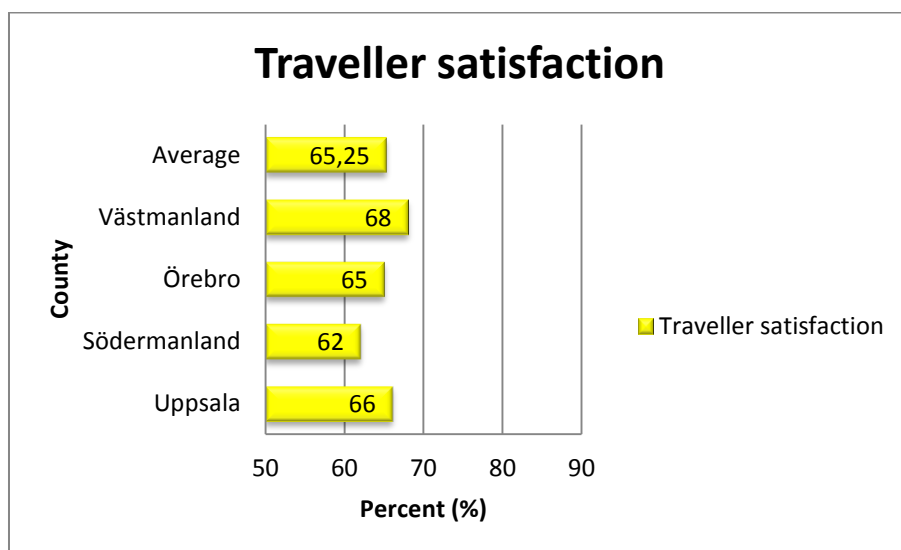


Table 5 - Public transport users' satisfaction in percent from year 2013 in the eastern region (Svensk Kollektivtrafik, 2013).

6.4.1 East Region Organization

The eastern region is represented by Jan Kyrk, managing director of Trafik i Mälardalen AB, together with Klas Bringert who is working as coordinator for the same organization and also Oscar Jonsson, head of strategic planning in Södermanland.

TiM AB is a company owned by SJ AB and MÄLAB who owns 50 % each. MÄLAB is a company created by the six counties within the eastern region to handle regional question influencing more than one county. In case of majority votes all six counties have to agree with each other's to fulfill their part and get as much votes as SJ AB.

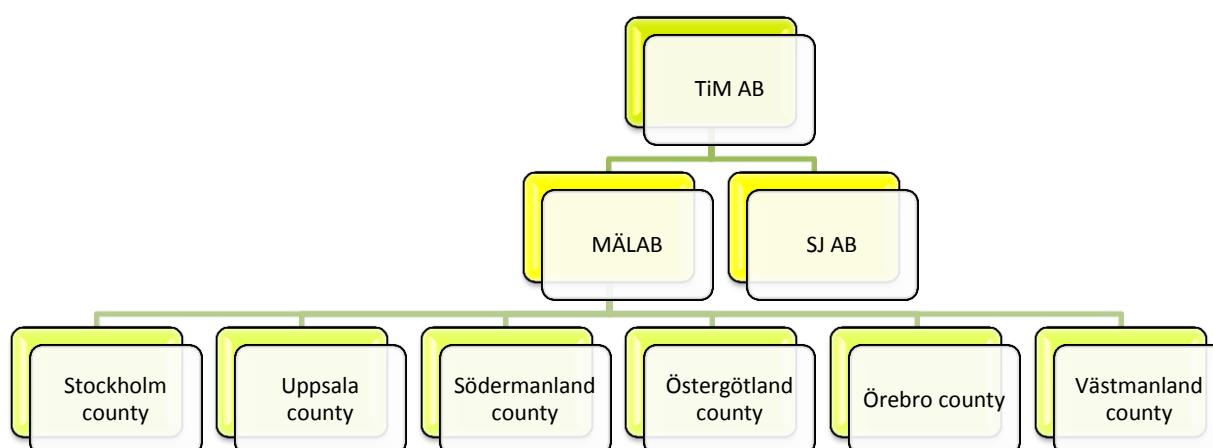


Figure 16 - A scheme over the cooperation within TiM AB in the east region

The eastern region has the greatest part of a commercial actor operating the regional transport. SJ Regional also is the largest train operator in the eastern region as well as commercial. SJ gets subsidies to operate on UVEN¹³ and some departures between Stockholm-Eskilstuna-Arboga otherwise, all other stretches operated by SJ Regional are handled on a commercial basis.

Goals for the eastern region are to create a functional region working as a large region with unrestricted travelling between the counties, both in terms of transfer between train and bus i.e. different travel modes and also between different operators.

Goals for the organization

- Figurative erase county boundaries
- Create one functional region
 - Both in terms of traffic mode
 - And between different transport companies

Who orders the traffic and who is financing?

SJ tells MÄLAB what they think they can manage with their own vehicles in commercial terms, and thanks to the city line, there will be more space for the trains when it is finished. All other traffic within counties are subsidized and ordered by the counties. If one county requests more departures than SJ applies to the working process is that the county contributes SJ AB with more money in order to get more departures or get a train to stop at a certain station. Other than that SJ AB collect all revenues and covers their own operating costs.

TiM AB is funded by the market premium of 6 million per year, half of which comes from SJ and half comes from MÄLAB.

Ticket system

In this region TiM is developed to figuratively erase the county borders. This means that every county has their own commutation ticket, but in order to travel between counties the traveler needs to buy a commutation ticket from TiM. TiM tickets are priced depending on the market prices in the region. Within the region every company sets its own rates and TiM offer combination discounts in order to offer package prices that will be slightly cheaper and more attractive than two separate tickets.

Vehicle Pool

¹³ Uppsala-Västerås-Eskilstuna-Norrköping which now goes Sala-Västerås-Eskilstuna-Norrköping-Linköping instead

In this region SJ AB owns their vehicles and has established a vehicle management with maintenance etc.

TiM AB as an organization, what is the main job assignment?

TiM AB is working for a connected region with easy travel. TiM AB is like a gathering place where people meet and discuss and exchange experiences.

The decisions made are about ticketing and when it comes to how traffic should coordinate in terms of connections, etc. They sit and discuss and give advice to each other, but ultimately each county owns the decision on how traffic should be conducted respectively.

6.5 South region

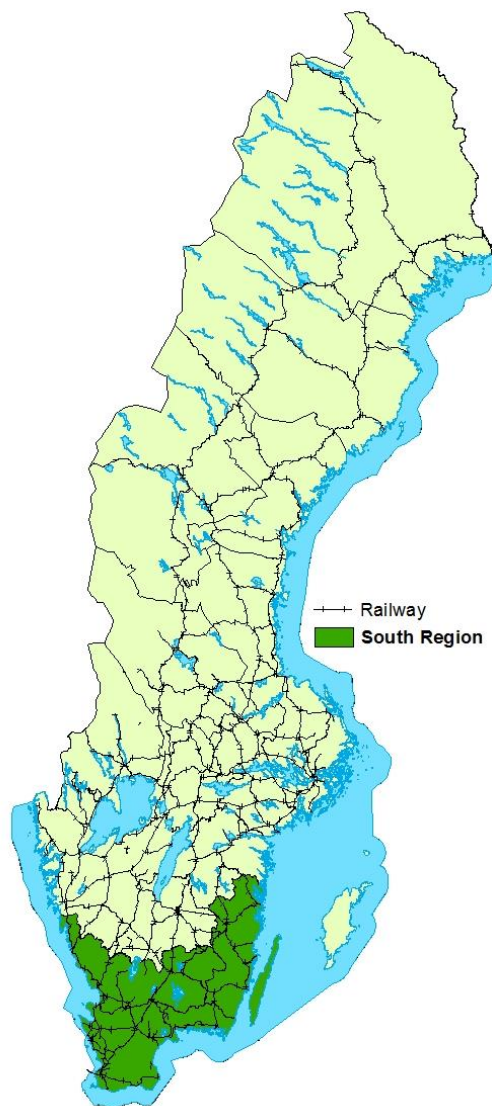


Figure 17 - Map of Sweden where the green highlighted area marks the southern region.

The southern region consists of five counties: Halland, Blekinge, Skåne, Kronoberg and Kalmar. The biggest city is Malmö which is located in Skåne and is the third biggest city in Sweden.

The south region has high speed trains along the west coast railway between Malmö and Gothenburg and also along the south main line between Copenhagen-Malmö-Stockholm. Other than that, the main train company in the region is Öresundståg.

In the regional traffic development plan of Skåne (2012) the importance towards Oresund Bridge is pointed out. This bridge connects Malmö to Copenhagen and has given a good opportunity for commuting between south of Sweden and Denmark.

According to Ålind¹⁴ Kalmar has a vulnerable position in the south region, whereas their ticket system is not compatible with the other counties and from the beginning Kalmar County were not included in Öresundståg AB. While noting that Halland County is at the same level in Sweden just

on the west coast instead of the east coast compared to Kalmar but yet with much stronger public transport. This can be explained by the position between strong development areas in Sweden. Halland County is in-between Gothenburg and Malmö which together with the eastern region in this thesis has the by far the fastest growth in population (Region Halland, 2012).

When looking at the satisfaction in the region, its differences. All counties except for Kalmar lay above the national average value of 61 % where Kalmar lowers the average with a

¹⁴ Ålind, P. At the regional public authorities in Kalmar. *Interview with P, Ålind 13th February 2014*. Telephone interview.

number of 56 % satisfaction. The travelers are most satisfied with the public transport company in Blekinge with 66 % satisfaction.

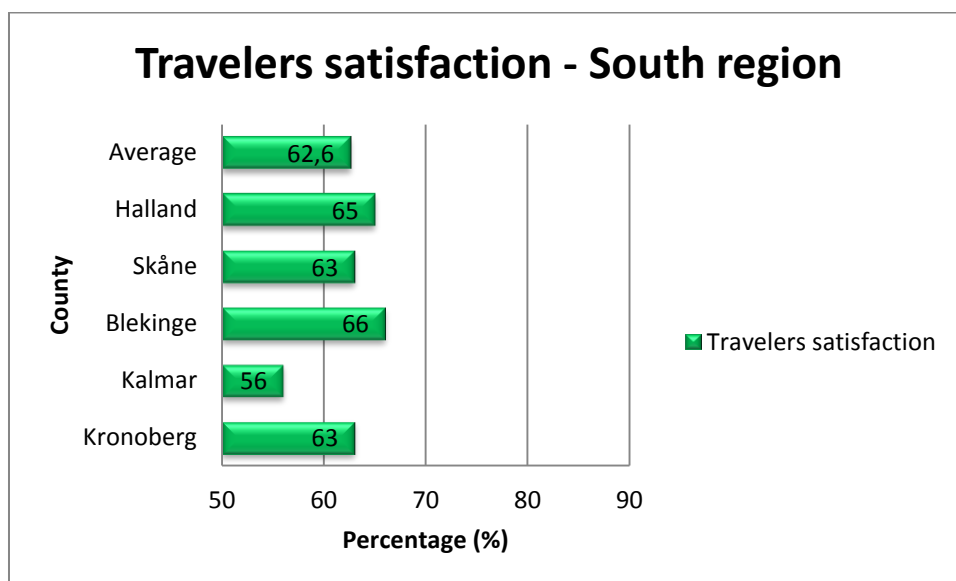


Table 6 - Traveler satisfaction in the south region. The national average value is 61 % (Svensk Kollektivtrafik, 2013).

6.5.1 The South Region Organization

The south region is represented by Gösta Ahlberg, former managing director of Öresundståg AB.

Öresundståg AB is the joint company of six counties: Skåne, Blekinge, Kronoberg, Halland, Kalmar and Västra Götaland¹⁵. The share is that Skånetrafiken AB owns 40 % of Öresundståg and the other owns 12 % each. Together they manage Öresundståg AB, which hires Veolia AB as operator in order to manage their trains.

¹⁵ Västra Götaland is mainly represented by Västtrafik AB which is owned by Västra Götalandsregionen.

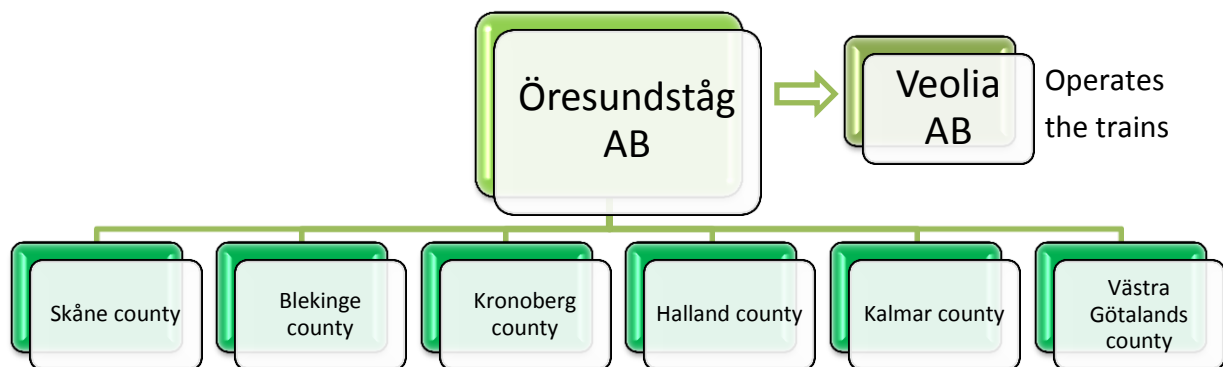


Figure 18 - The six counties included in Öresundståg AB where Skånetrafiken AB in Skåne County owns 40 % of the company and the other five equally the rest.

The background for creating Öresundståg AB evolved from the time where SJ had a monopoly of the railways in Sweden. The general view were that SJ took advantage of the situation and avoid less fortune railway stretch and therefor the counties in the south regions wanted to take control over this. The aim was to coordinate the county's needs and erase the boundaries between them. Create regional political resourcefulness in southern Sweden. The political commitment was strong because of this in the creation of Öresundståg AB.

Goals for the organization

- Erase county boundaries
- Increase travel
- Allow for flexible labor markets
- Create long-term sustainability

Who orders the traffic and who is financing?

Öresundståg AB orders the traffic on the behalf of the six counties within the southern region and these counties subsidize the traffic that is not covered by ticket revenues.

Ticket system

There are different technologies in the systems, but with Sydtaxan one can go across county boundaries and locally on arrival at a station. However, it doesn't work in reverse where one can't go on a bus to get to the station, so there is more to be desired.

Each county has its rates and their fees and thus their own revenues.

Vehicle Pool

It is based on the agreement with the Danish side. Every vehicle in the Öresundståg AB should be identical, and no regional public transportation authorities within a county can say that "we own so and so many trains and we want them to go there and there," but rather they'll go where it fits best. The counties have leased their trains via Transitio¹⁶.

Öresundståg AB as an organization, what is the main job assignment?

Öresundståg AB is responsible for allocating the economy between the counties. If for example one county is short on a train that was needed for the rush hour, they are able to pay a capital cost so that another county can lend a train to cover the need.

¹⁶ A company owned by all county councils in Sweden who: acquires, finances and manages rail vehicles to their owners (Transitio, 2014).

7 Statistics

One tool to analyze the different regions is to compare statistics as a measure of the development in the region. This chapter will present statistics from each region divided into characteristics and indicators. Each statistic is presented with all regions value in order to make it easy to compare them.

7.1 Characteristics

Characteristics are non-modified data that tells the situation as it is today. This data will be analyzed and progressed into indicators and analysis later.

7.1.1 Population

The population in a region affects the amount of trips generated within this area¹⁷. It is useful to understand the distribution of population among the regions for further comparison.

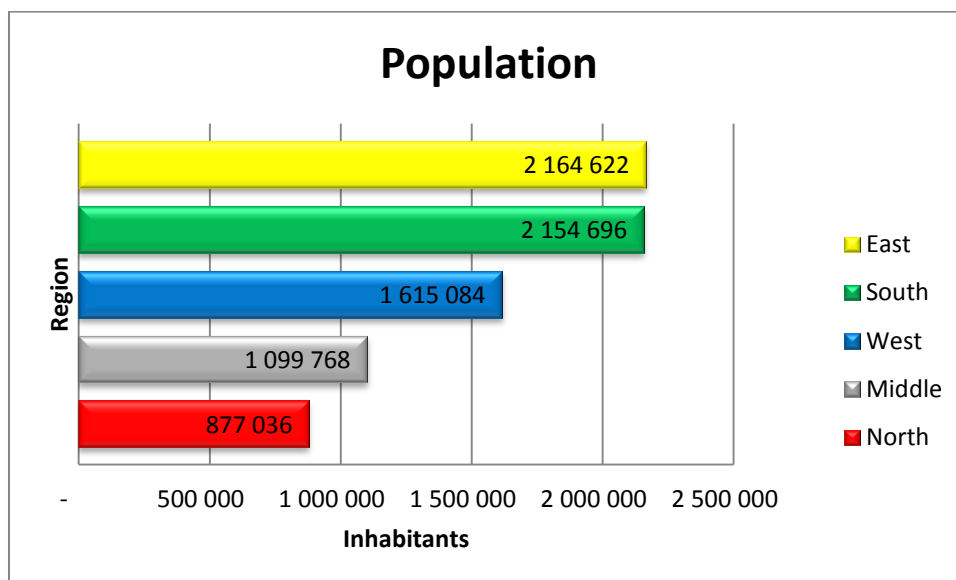


Table 7 - Population of each region from 2013 (SCB, 2013).

The population is calculated as the number of people in each county that is included in the regions. The east region has 23 % of the population of Stockholm because that is the calculated factor of how many that is doing regional journeys in Stockholm. This means that the eastern region has the highest population closely followed by the southern region with almost the same amount of people. The lowest population is to be found in the northern region that almost only got one third of the eastern and southern region regarding population.

¹⁷ When comparing the number of trips in a region it is easy to miss that a region with high population will create more trips than a region with low population. This means that indicators such as number of trips can be misleading if it is analyzed isolated from other indicators.

7.1.2 Population density

Further investigation is required to see how dense people live. A more dense area can easier be covered by public transport since one station or bus stop will be closer to more people in a dense area than a less dense area. The density differs a lot from county to county within the regions, so this table presents each sub-region followed by an average for the whole region.

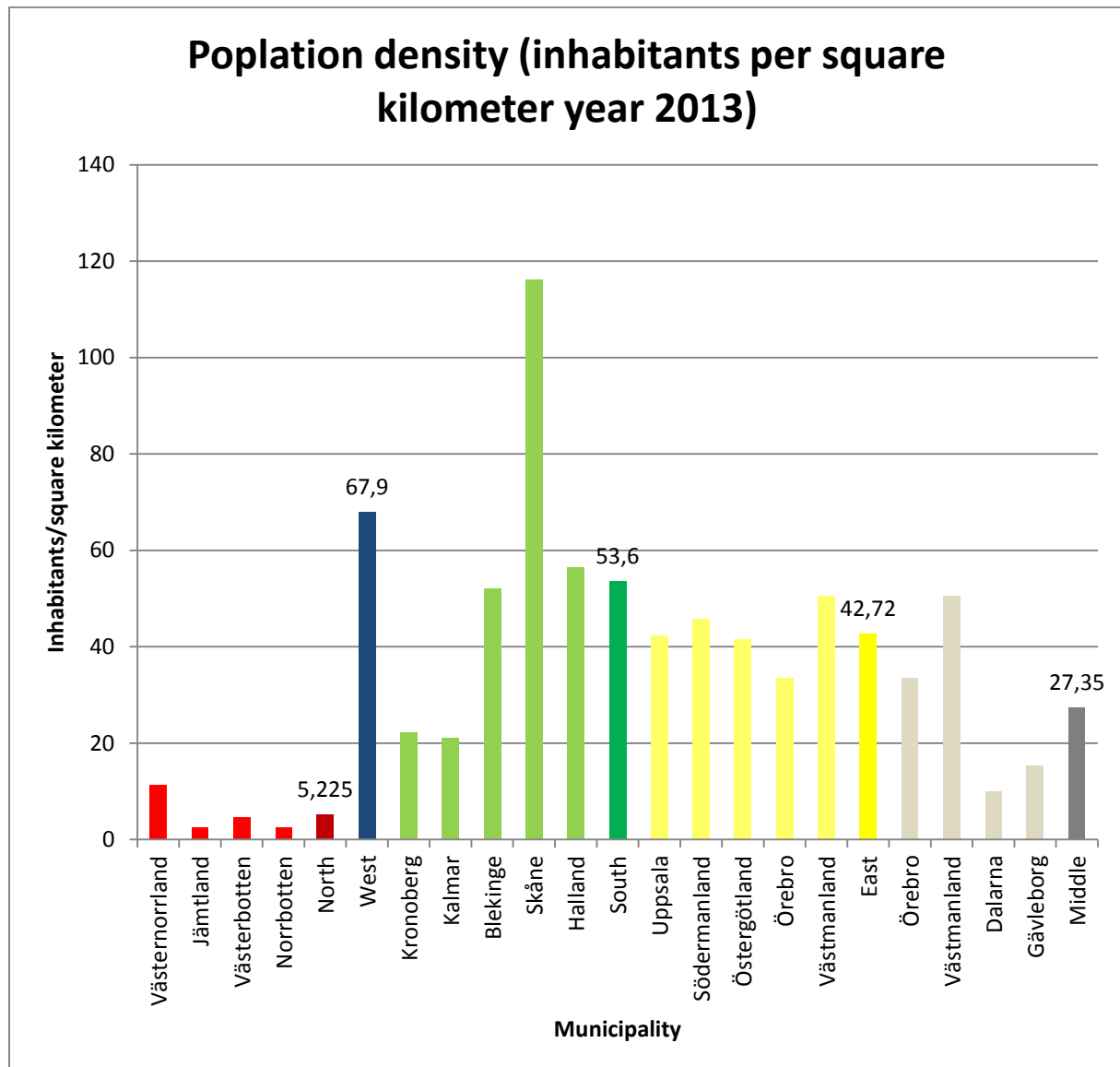


Table 8 - Population density per square kilometer with sub-regions. Two sub-regions, namely Örebro and Västmanland are used twice, both in Region Middle and Region East, since they contribute to both systems that compete within these two counties. The statistics are collected from SCB with data from 2013 (SCB, 2013).

When it comes to population density it does not follow the population, whereas the south and east region had the most. When it comes to population density the western region has the greatest density. As can be viewed in table 8 Skåne stands out for having a dense area, but the other counties in the southern region are lowering the average amount.

7.1.3 Traffic revenue per vehicle kilometer

The traffic revenue per inhabitant in a region is a measure where all revenues from public transport are divided by the actual carried traffic.

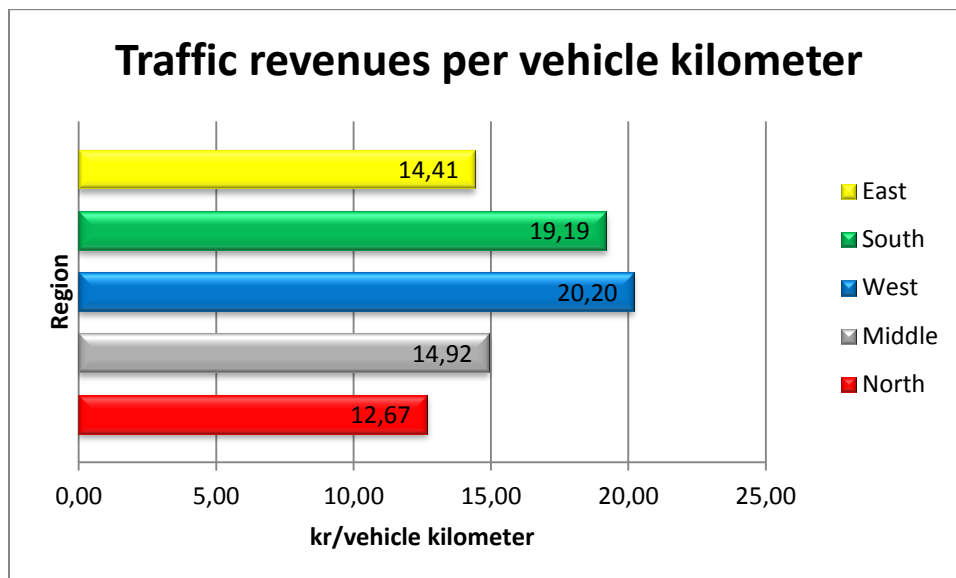


Table 9 - Traffic revenues per vehicle kilometer in kronor per kilometer (Svensk Kollektivtrafik, 2012).

The traffic revenues are greatest in the west region and the south region, whereas it is lowest in the north region. It is important to remember that the revenue alone doesn't tell much about the regions, but together with the cost it is possible to say something about the investment in public transport.

7.1.4 Traffic cost per vehicle kilometer

The idea with this measure is to get a cost for how much does it cost for the public to travel one kilometer by railway. This characteristic is combined by two things. The first is traffic cost which includes direct costs for implementing traffic such as, for example, handling, lease, rental or capital costs for vehicles, equipment costs in the vehicle, the cost of terminals, ticketing and track fees, staff costs for staff on board vehicles, station and terminal. The vehicle kilometer on the other hand is a measure for the actually carried traffic and is equal to what is sometimes called time schedule kilometers. Vehicle kilometers exclude cancelled traffic and include additional disposed traffic (Svensk Kollektivtrafik, 2012).

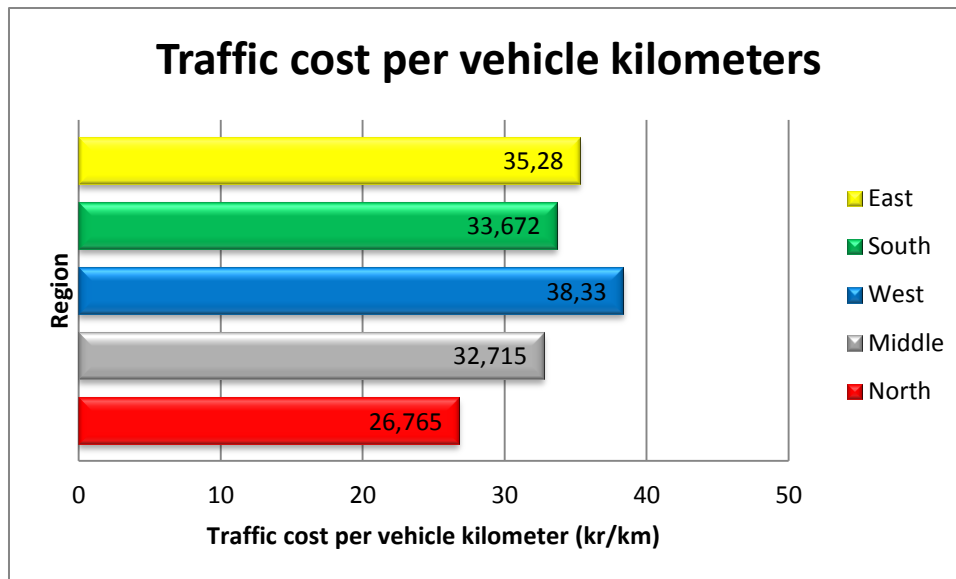


Table 10 - Traffic cost per vehicle kilometer in kronor (Svensk Kollektivtrafik, 2012).

There are several ways of reading the traffic cost per vehicle kilometer. One can think that the western region with the highest traffic cost is the most inefficient region. On the other hand, one can think that the western region allows the public transport to cost much in order to make it more attractive. Regardless how this indicator is interpreted the costs can be infinitely high as long as the revenues follow this pattern.

7.1.5 Tax contribution per capita

Tax contribution is a measure of how much taxes, in kronor per capita, that is part-financing the public transport in the region.

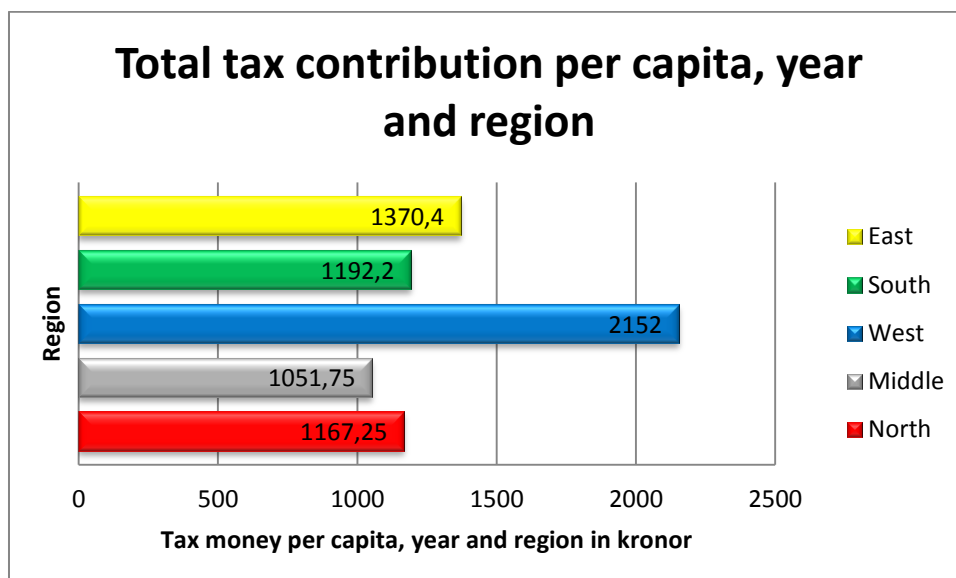


Table 11 - Tax contribution per capita, year and county in kronor from year 2012 (Svensk Kollektivtrafik, 2012).

The west region stands out for having much higher tax contribution than the other regions. This may be because it is costly to provide public transport in larger cities and as can be seen in table 12 the western region has the biggest expenses when it comes to public transport.

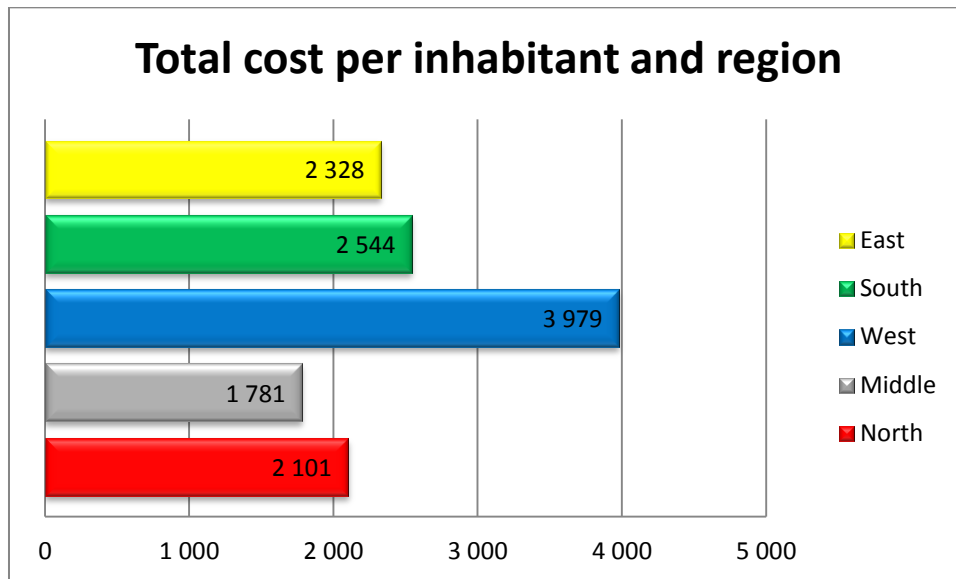


Table 12 - Total cost per inhabitant and region. The west region spends the most money on public transport because the expenses of Stockholm are excluded.

The bigger costs in bigger cities also come with larger revenues and by looking at the revenues for each region it can be seen that the western region has greater revenues as well, but it is important to remember that the tax contribution covers the difference between cost and revenues and this value is still the biggest in the western region.

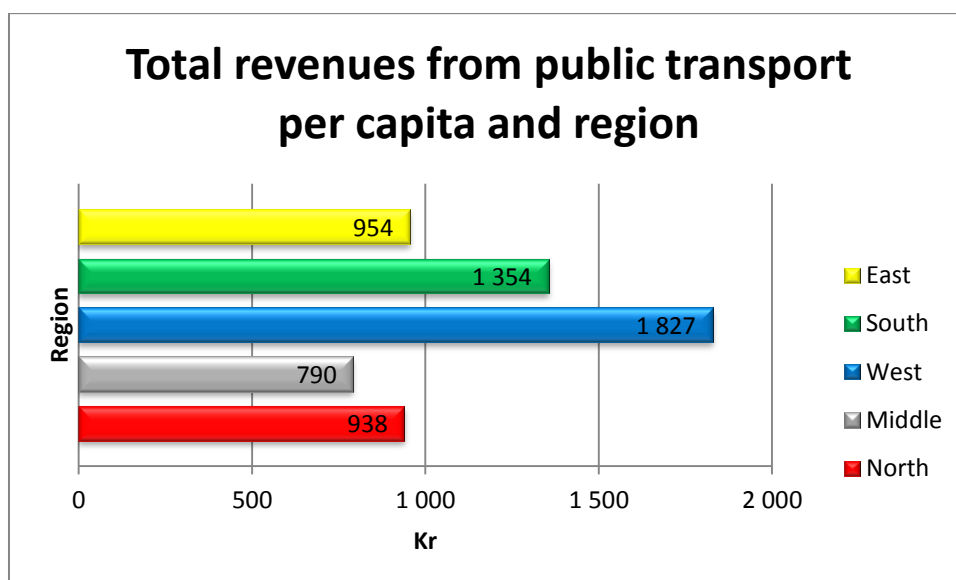


Table 13 - Total revenues from public transport in each region in kronor per capita (Svensk Kollektivtrafik, 2012).

7.2 Indicators

The indicators will work as a follow-up on the characteristics. After having a general idea of population, companies within the region and regional goals the next step is to understand how well the public system works in the region. This will be presented in the form of indicators where market share is one example of how successful a region is regarding getting people to travel by public transport, and cost coverage is a measure of how much taxes are spent on public transport versus revenues from the company itself. By comparing these data it is possible to find strengths and weaknesses in the regions.

7.2.1 Net cost per vehicle kilometer

The net cost per vehicle kilometer is the cost per vehicle kilometer minus the revenue per vehicle kilometer as a measure of efficiency.

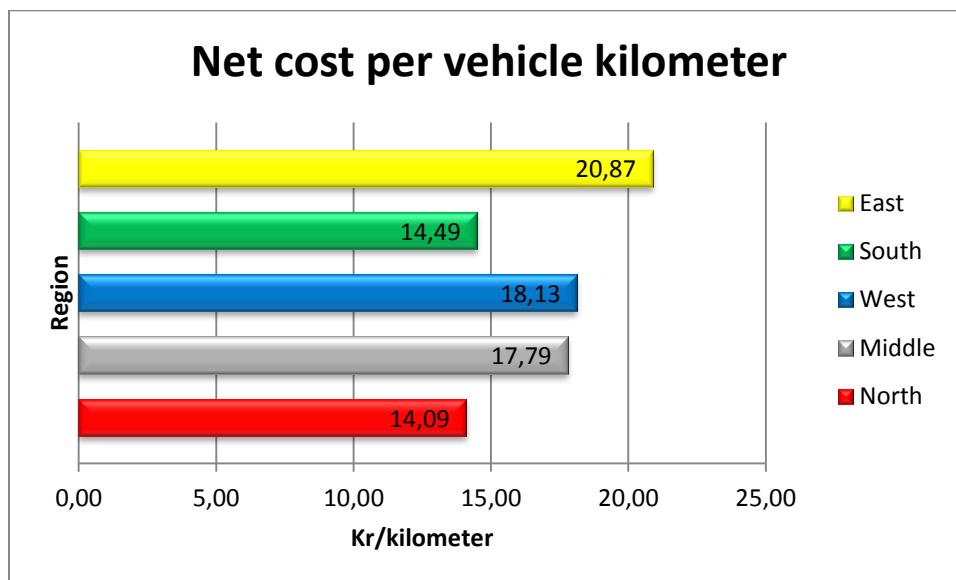


Table 14 - Table showing the net cost as kronor per vehicle kilometer. The net cost is the cost minus the revenues for the traffic that actually were carried out in the regions (Svensk Kollektivtrafik, 2012).

The highest net cost per vehicle kilometer is in the East region, whereas the south and the north region have the lowest. The vehicle kilometer is the actually carried traffic in a region and the cost for providing this is divided with the total vehicle kilometer in the region. When comparing the south and the north region they have a different traffic cost per vehicle kilometer but since the south region provides more traffic they end up at the same ratio.

7.2.2 Cost coverage

Cost coverage is the share between ticket revenues from the transport companies and subsidized taxes from the county. This is measured in percentage and if a county has 100 % cost coverage it means that the ticket revenues cover all costs that comes along with running a public transport company, and opposite if the cost coverage is 0 %, it means that

the transport is free to use for the traveler and all costs are covered by taxes. In Sweden the national average value of cost coverage was 45 % in year 2012 (Svensk Kollektivtrafik, 2012).

$$C_c = \frac{T_r}{T_c} \quad [7.1]$$

Where

C_c = Cost coverage for the region

T_r = Total traffic revenue

T_c = Total cost

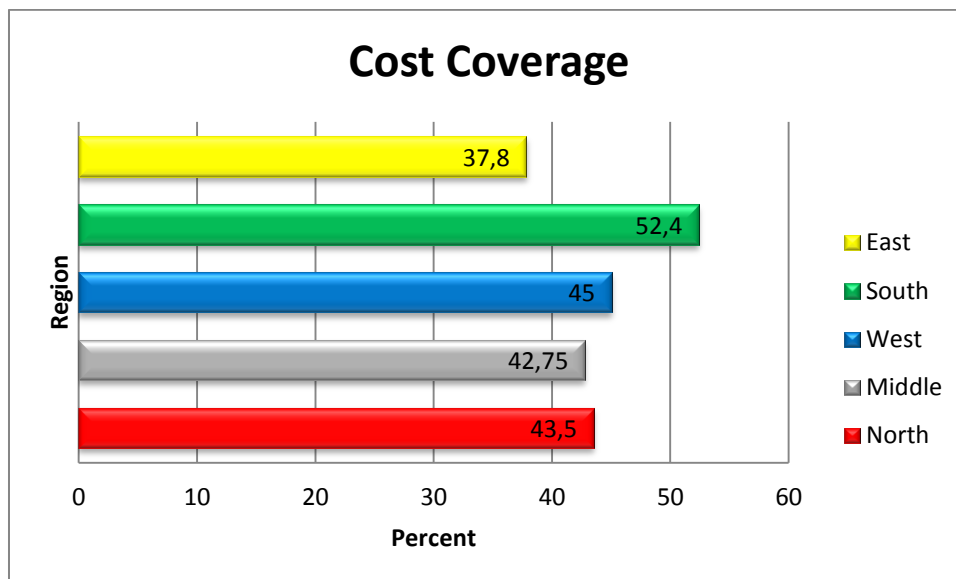


Table 15 - Cost coverage showing total traffic revenues divided by total cost (Svensk Kollektivtrafik, 2012).

The cost coverage easily becomes a political question regarding how much of the public transport should be funded through taxes. As it is today in Sweden the southern region has a bit less than half of the costs funded from taxes, whereas counties in the east region almost pays 62.2 % on average in taxes. If recalling the total tax contribution from the previous section it differs a lot from region to region regarding how much these percentages actually means in Swedish kronor.

7.2.3 Public transport share

The public transport share is one of the most discussed indicators regarding public transport. This indicator is a measure of how many journeys that are done by public transport in percent. The ratio is calculated as:

$$PT_s = \frac{TT_{PT}}{T_t} \quad [7.2]$$

Where:

PT_s = Public transportshare

T_t = Total number of trips per year in the region excluding bicycle and walking

TT_{PT} = Total number of trips made by public transport

Public transport's market share is defined as the number of trips by public transport and taxi including mobility services in relation to the private motorized travel; car drivers, car passengers and scooter / motorcycle. Public transport in this case includes all public transport, both the procured county and local traffic and the fully commercial (Svensk Kollektivtrafik, 2012).

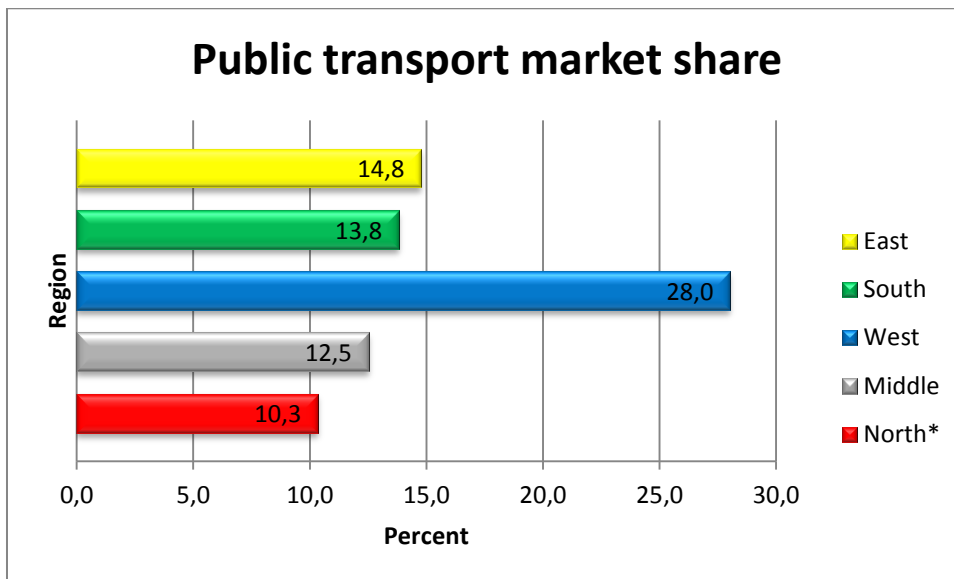


Table 16 - The public transport market share when Stockholm is excluded (Svensk Kollektivtrafik, 2013).

When including Stockholm:

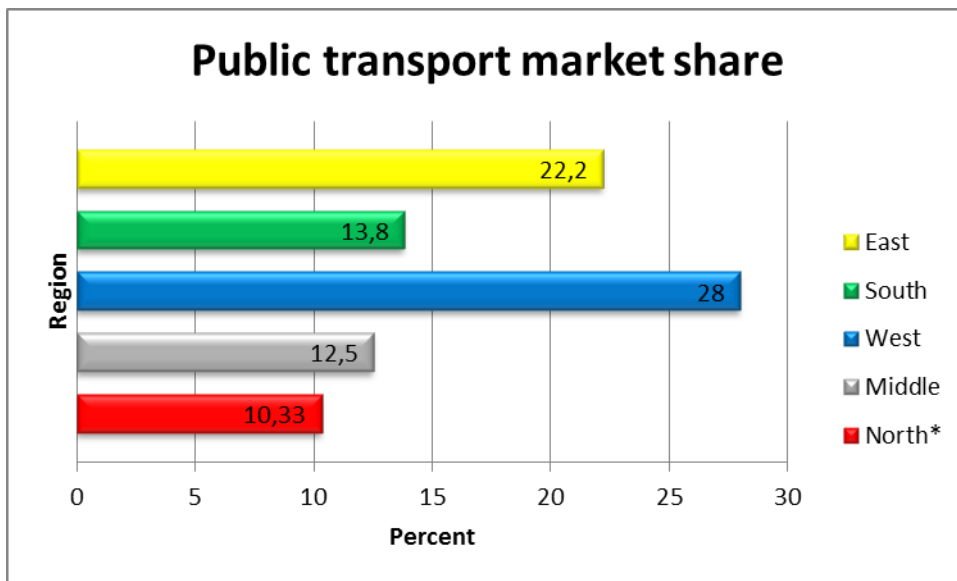


Table 17 - Public transport market share from year 2013 with Stockholm included (Svensk Kollektivtrafik, 2013). *Jämtland and Östergötland are excluded from the statistics since they didn't participate.

In this report the main focus lies within the regional travels and therefore table 17 shows a recalculated version of the public transport market share when excluding as many regional trips as possible¹⁸. This calculation excludes all trips with metro, tram and boat, and is reducing the number of trips with buses since most of them are local trips.

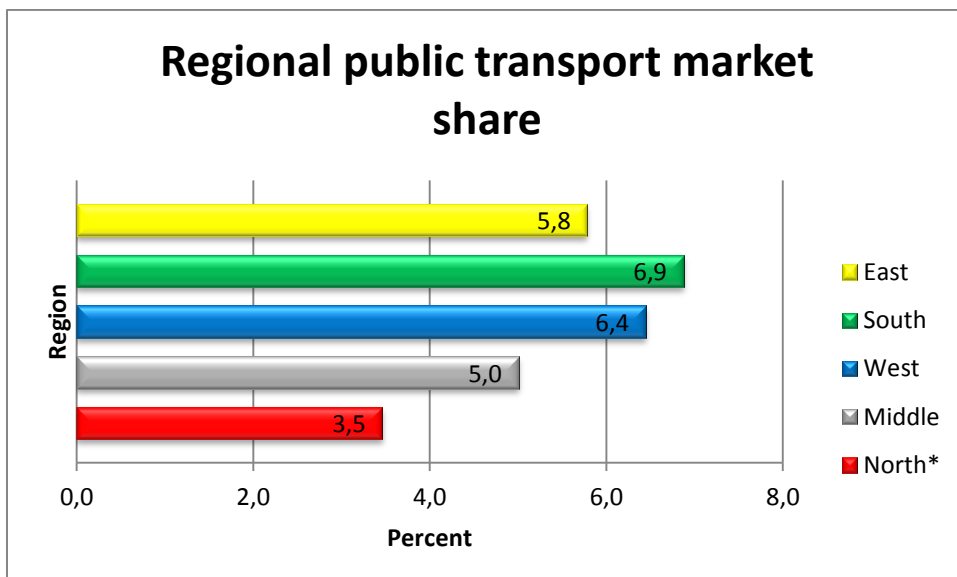


Table 18 – Regional public transport share by recalculating the total public transport share in each region.

¹⁸ As discussed in the limitation in the beginning of this report.

When looking at the recalculated regional public transport market share the southern region has the greatest share and it can be noted that the subway in Stockholm and trams in Gothenburg stands for a big part of the journey.

7.2.4 Number of trips (number of passengers boarding)

Number of trips per capita is measured in the number of boarding passengers per year and region. For all regions with more than one county¹⁹ an average number is calculated for the region. The indicator itself counts every boarding, meaning that a journey with a return trip is calculated as two trips and every transfer is a new trip. In order to calculate for that a region get more trips if there are many inhabitants, the indicator is divided with the number of people in the region.

$$N_t = \frac{T_t}{T_b} \quad [7.3]$$

Where:

N_t = Number of trips per inhabitant, year and region

T_t = Total number of boarding's per year in the region

T_b = Total number of inhabitants in the region

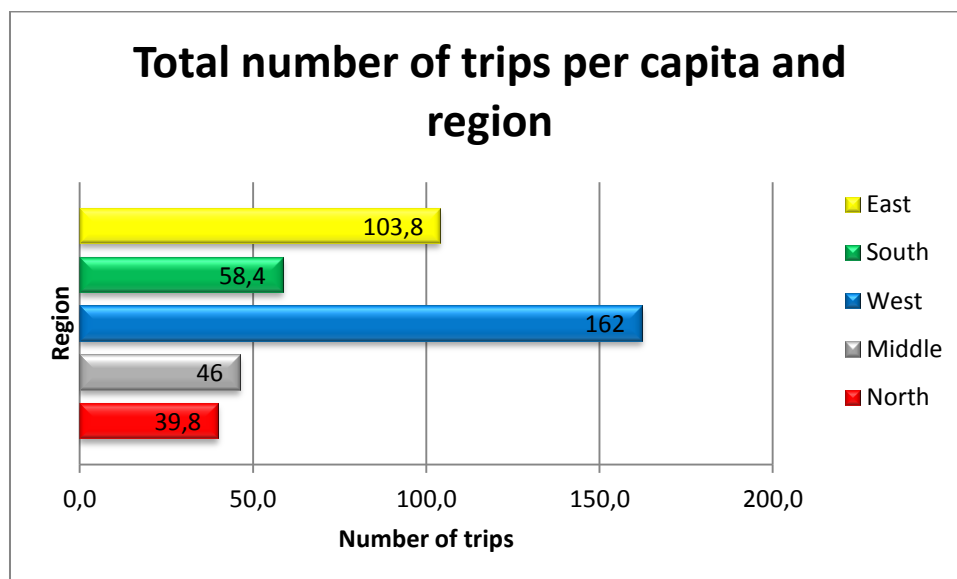


Table 19 - Total number of trips measured as number of boarding in each region per capita (Svensk Kollektivtrafik, 2012).

In this section it is the same problem as with the public transport market share. The local trips in especially the east and west region stands for a huge part. By using the same method and recalculating the trips into regional trips the result is to be found in table 19.

¹⁹ All regions except from the west region that only consist of Västra Götalands county

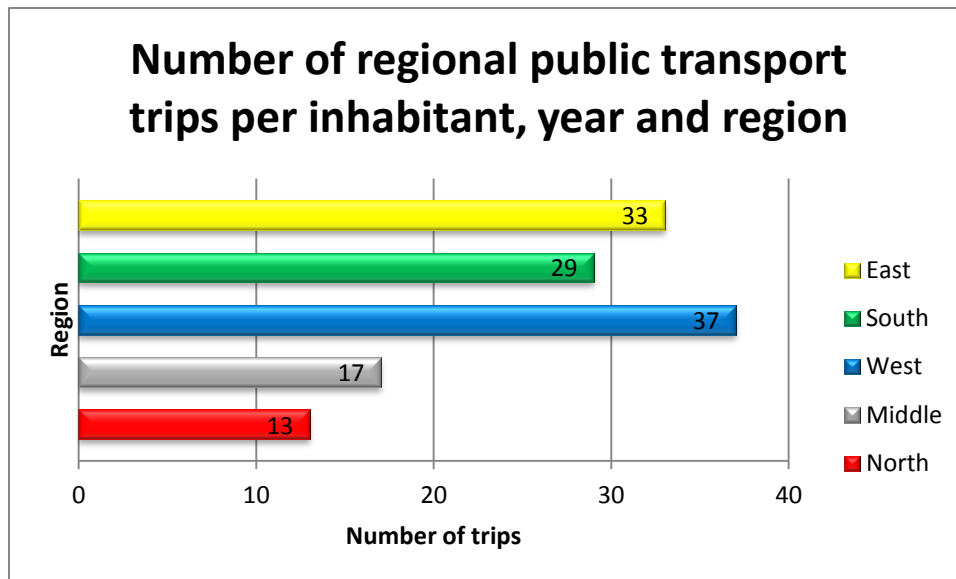


Table 20 - Number of regional trips per person, year and region from 2012 (Svensk Kollektivtrafik, 2012).

It is still the west region that has the most number of trips in the region, but the differences between each region are smaller.

8 Analysis

The analysis section is due to adapt the model onto every region in order to see patterns. The organizational structures from the presentation of the regions together with the summarization of the statistics from the previous chapter, this analysis should give an overall knowledge about each region. Since lowest has sometimes been better than highest and vice versa the analysis will be marked with +, - or $\pm$ depending on if the value indicates a weakness (-) or a strength (+) or if it is neutral ($\pm$).

8.1 The Northern Region

- + Lowest traffic costs per vehicle kilometer
- + The highest user satisfaction with the PT
- The lowest traffic revenues per vehicle kilometer
- Second lowest total revenues from public transport per capita
- $\pm$ Lowest population
- $\pm$ Lowest density
- $\pm$ Second lowest tax contribution per capita
- $\pm$ The youngest system

Indicators

- Lowest market share both in terms of all traffic and recalculated traffic
- Lowest number of trips
- + Lowest net cost per vehicle kilometer
- $\pm$ Third highest cost coverage rate

Problems

- Bad economy
- Large distances
- Railway where people don't live

As written in the regional description the population density in the north region confines of that it is the largest region with the lowest population, which will automatically lead to a low density and the included counties struggle with over bridging the large distances. But again as noticed in the previous chapter they are just as dense as the rest of the counties when concentrating specifically on the east coast.

Norrtåg that operates in this region is the most recent railway system since year 2010 (Fröidh, 2014). According to Thörnberg²⁰ the opening of Bothnia line and the start of Norrtåg reached out to new customers in the northern region. Further development could continue this trend and get people to leave their car and use the northern Bothnia line if it gets built. The market share is low in this region and since it is in percentage, the low population doesn't explain this. The low number of trips and the low market share are highly certainly a product of the railway that is neglected and not built where the people live²¹. The users however are the most satisfied with the public transport company in the region in Sweden.

Jämtland chose not to participate in the national doubling project because of the high costs that is required. Both Thörnberg²⁰ and Ericsson²² prove the strained state in the economy by explaining how one tries to develop the public transport for as little money as possible. The traffic cost per vehicle kilometer together with the revenues and lower market share strengthens that the northern region doesn't have as well established public transport as the rest of the region. The lowest net cost per vehicle kilometer can indicate that the region is efficient, but when compared with the southern region where the net cost is almost as low as the northern region but almost twice as high public transport market share the meaning of efficient fades.

Trends are showing that low population and density leads to low market share and low number of trips. As a result, low usage leads to a small room for the public transport in the budget and under present circumstances; it is hard to provide any more efficient public transport than today in the northern region.

8.2 The Middle Region

Characteristics

- + Second lowest traffic cost per vehicle kilometer
- Third highest traffic revenues per vehicle kilometer
- Smallest total revenues from public transport per capita
- ± Second lowest population
- ± Second lowest density
- ± Smallest amount taxes spent per capita

²⁰ Heidi Thörnberg, Head of public transport authorities in Västerbotten. Telephone interview 14th April 2014.

²¹ Apart from the Bothnia line that connects Umeå and Örnsköldsvik the people lives at the east coast and the rest of the railway are further into to country.

²² Ruth Ericsson, public transport strategist in Jämtland. Telephone interview 15th April 2014.

Indicators

- The third highest net cost per vehicle kilometer, close to the west region
- 12.5 % public transport market share, which is second lowest
- Second lowest regional PT market share.
- Second lowest number of trips per person both total and recalculated trips
- ± 43 % cost coverage

Problems

- Many car users, especially in Dalarna
- No big city in the region
- Expensive public transport

The middle region doesn't have that many people in the region and they are spread out since the low density. Also, this region spends the smallest amount of taxes per capita in favor of the public transport.

It is interesting to notice that the net cost per vehicle kilometer is almost as high as the western region, which spends the most money on public transport of all regions. Another interesting thing is that the cost coverage is the second lowest but regardless of this the region spends the smallest amount of tax money per inhabitants. This is a result of being the region that spends the smallest amount of money in public transport per inhabitant.

In the north part of the region, there are many car users and therefore hard to provide good public transport due to their habits. On the south side there are many people travelling in Örebro County but they struggle from being close to TiM and the commuting to Stockholm. This region should gain from getting more integrated with TiM and by planning the traffic together in an early stage. The middle region is as the name intends in the middle. With no bigger city in the region, there are a lot of people commuting out from the region and connects through Västerås and Örebro/Hallsberg is of great importance.

8.3 The West Region

Characteristics

- + Biggest total revenues from public transport per capita
- + Highest traffic revenues per vehicle kilometer
- Highest traffic cost per vehicle km
- ± Third highest population
- ± Highest density
- ± By far highest amount taxes spent on PT's

Indicators

- + Highest market share (28 %) including trams
- + Second highest regional market share (6.4 %)
- + Highest amount of trips per person
- Second highest net cost per vehicle kilometer
- ± 45 % cost coverage

Problems

- Lowest satisfaction
- ± Highest money spent

With the third highest population and the highest density, this region has a good foundation for providing efficient public transport. This region also stands out for having a high cost for the public transport. This region has the highest cost per vehicle kilometer and also the highest amount of contribution from taxes. This fact can be analyzed in many ways. One way of seeing it is that this region allows the development of the public transport to cost money, and for example this region has a goal to triple the market share of public transport, not double as the national goal is set to. The other way of seeing this is that this region is very inefficient and spends a lot of money when other regions don't need to. However, regardless of high costs this system nearly covers half of the expenses (45 %), and further this region got the highest market share in this thesis.

Taken together, this region has the highest costs, the highest amount of travelers but lowest satisfaction rate. The lowest satisfaction is noted by the Västra Götalandsregionen (Efraimsson, 2014). In order to fix this they interviewed 1500 people and got the result that the ticket system is way too complicated. The ticket system stands for a large part of the

reason for this low rate of satisfaction among the users. This region gives the biggest economic support to the public transport.

Trends are showing that high population and density come with higher costs, revenues and market share.

8.4 The East Region

Characteristics

- Second lowest traffic revenues per vehicle kilometer
- Second highest traffic cost per vehicle km
- Third lowest revenues from public transport per capita
- ± Highest population
- ± Third highest density
- ± Second highest tax contribution per capita to PT's

Indicators

- + Second highest amount of trips per person
- 14.75 % market share or 22 % if Stockholm is included
- Third highest regional public transport market share
- Highest net cost per vehicle kilometer
- ± Lowest cost coverage (37%)

Problems

- ± The lowest amount of money back from spending tax money
- ± Large commercial player
- ± High focus on Stockholm

The area around Stockholm grows much faster in population than any other city in Sweden. With the fact that a large amount of people commutes to Stockholm every day there is great capacity in this region. People are living a bit sprawl in the counties since it only has the third highest population density in this report. With the second highest traffic cost and tax contribution together with a high focus on Stockholm this region suffers from low cost coverage. Low cost coverage can be an indication of letting the public transport cost in order to increase the market share, but it is also an indication of much money spent and low money in return which equals inefficient transport. The market share is the second highest but close to the south and middle region which is number three and four, rather than the

western region that is number one. This region stands out for having a large commercial player that operates many parts of the traffic. All commercial entities, regardless of the industry, strive to optimize their benefits. This means that they want to perform transportation on beneficial lines and on lucrative times. The authorities on the other hand want to provide transportation for school and workplaces in the region and in order to gain that they pay SJ money for stopping at certain stations, allowing commutation tickets within their county and add more departures at less lucrative times. All this compared with spread travelling this region struggle with the cost coverage rate. By looking at Södermanland as an example, there are four bigger commuting paths that split the county and no obvious starting point because the lack of one bigger city within the county. This gives a difficult task in providing bus traffic between all these lines and together with nearly only expenses from the train traffic it is not surprising that the cost coverage is low. There is an obvious focus on Stockholm, which creates barriers towards adjacent regions in planning for the time schedule, whereas Tim AB and SJ AB want to optimize the commuting towards Stockholm rather than the rest of the country. A commercial actor doesn't necessarily need to be a problem, but it is in the eastern region as it is today if looking at the economics of the region. If the counties should take over the traffic under its own management, it would require that they acquire their own vehicles and many other costly parts such as staff, maintenance, operator and more but it would also mean insight into planning and revenue from strong routes.

8.5 The South Region

Characteristics

- + Second largest total revenues from public transport per capita
- + Second highest traffic revenues per vehicle kilometer
- ± Second largest population
- ± Second highest density, if looking at counties separately Skåne has the highest.
- ± Third lowest tax contribution per capita
- ± Third highest cost per vehicle km

Indicators

- + Second lowest net cost per vehicle kilometer
- + Highest recalculated regional market share.
- ± Highest cost coverage rate (52 %)
- ± 13.8 % Market share, which is in the middle (Skåne has 24 %)
- ± Third highest number of trips per person

Problems

- ± Unnecessarily high ticket prices?
- ± Increase public transport market share in all parts of the region

This region has great differences from county to county. In general Skåne has a very strong public transport meanwhile Kalmar struggles. The railway along the west coast is connecting Malmö and Gothenburg and has a high capacity on the trains. The other strong line is the south main line between Malmö and Stockholm, but there is no east coast line. This means that people are passing through in the middle of the country and on the west coast, but has no passage through Kalmar on the east coast. This is one reason for the lower statistics in Kalmar. Furthermore are Kalmar and Kronoberg County less dense than the other counties and harder to provide efficient public transport too.

With the second highest population and high density together with the connection to Denmark this region has good conditions for successful public transport.

The question raised from the high cost coverage is that if the south region has to high ticket prices to gain “unnecessarily” much money. Since the public transport is a community service for moving people there is a political issue whether this service should cost more or less money. If they would lower their ticket prices, would the public transport market share

increase? Maybe this already is the case that the ticket price is low and they have generated many travelers from this, but again, how much the public transport is allowed to cost in comparison with the gains is a political question rather than a revenue/costly one.

This region has more developed public transport than the northern region and larger system, still this region has a low net cost per vehicle kilometer as the northern region. The problems in this region lie within connecting all counties and developing the interregional travels. Skånetrafiken AB owns 40 % of the interregional collaboration Öresundståg AB and the travelling inside Skåne is impressive. This county raises the mean of public transport in the region. As it can be impressive to be an efficient region regarding economic values the long term goal is to increase the public transport market share in the area. This will cost money and it won't contribute to its cause by being too efficient in a sense where the costs are limited in order to look good.

8.6 Correlation

Correlation gives a relationship between -1 to 1 that tells how well the data follows each other's. If one data point is high at the same time as other data and low at the same point there are reasons to believe that these data are correlated. If two data series acting in the exact same pattern their correlation would be 1. If one data increases exactly as much as another data point decreases at the same point, they are perfectly correlated at -1. In-between this range -1 to 1 the value of zero means no pattern at all. The thing with correlation is that two data can be correlated without any reason and it might be just a random coincidence. Why correlation is useful and the reason for presenting these statistics in this report is mainly to see where there is no correlation at all, and secondly to look further into the connections that are found in the research.

In the previous section of the analysis, it is possible to see some patterns where high population leads to large costs, etc. With the correlation it is further analyzed in order to see how well this is true for all regions.

8.6.1 Public transport market share

The public transport market share is a commonly discussed variable as a measure for successful public transport. In this report the statistics show patterns where it seems to be the case that more dense regions have higher public transport market share and this correlation analysis is due to investigate how similar the relationships actually are between different characteristics and indicators. As can be seen in table 21 there are a negative correlation between the market share, as they go up, the satisfaction among the travelers go down, which will be further discussed later. It can be seen that the market share is higher in regions with higher density, greater revenues and larger costs. The net cost per vehicle is not correlated with high market share, which can indicate a relationship that shows that the

traffic doesn't need to be more expensive in order to get more travelers. Or rather, that the costs that comes with more travelers also come with revenues.

	<i>PT Market Share</i>
Traveler satisfaction	-0,95
Population	0,67
Population density	0,80
Traffic revenue per vehicle revenue	0,75
Traffic cost per vehicle kilometer	0,81
Tax contribution per capita	0,97
Net cost per vehicle kilometer	0,36

Table 21 – Correlation table showing how public transport market share is correlated with other data in the report. Green colour marks positive correlation, red marks negative correlation and beige marks no or weak correlation.

To sum up this part it means that where the public transport market share is higher the population, population density, traffic costs and traffic revenues are also higher. The market share is more correlated with the population density than the population itself. This can be understood when thinking about the fact that the market share includes local trips which is easier to supply in dense areas.

8.6.2 Commercial actor

In this section one indicator to reflect whether a commercial operator has a significant role in the region was added. This led to a result where there is a positive correlation between commercial actors and the net cost per vehicle kilometer.

	<i>Commercial actor</i>
Net cost per vehicle kilometer	0,75

Table 22 - Correlation matrix for commercial actor where a relation between commercial actor and high net cost per vehicle kilometer inside a region were found.

If a region has a strong influence of a commercial actor doesn't seem to affect any other parameter than the net cost per vehicle kilometer. In other words, it seems to be a relationship where the net cost of the public transport is more expensive in regions where a commercial actor has a big influence.

In the report, there are statistics that show that it is more expensive to provide public transport in the east region than in the other regions. In this region the county does not earn anything on train traffic since SJ AB provides this service. Besides this fact is the counties want the trains to stop at a stop where SJ AB doesn't, the counties have to pay extra and all this together leads to a situation where the economy suffers. The correlation in this section verifies this.

8.6.3 Traveler satisfaction

The satisfaction among the travelers seems to decrease when other characteristics increases. There is no proof for any relationship between these characteristics and the traveler satisfaction, but the correlation is notable. One explanation could be that regions with more people and more dense areas have in general more expanded public transport. This leads to more travelers and bigger costs and revenues and in particular more knowledge among the users and as a result of greater awareness among travelers. As a consequence of more aware travelers, these travelers will demand more and are more dependent on the public transport, and therefore a bigger share will be dissatisfied.

	<i>Traveler satisfaction</i>
Population	-0,84
Population density	-0,95
Public transport market share	-0,95
Traffic revenue per vehicle revenue	-0,84
Traffic cost per vehicle kilometer	-0,94
Tax contribution per capita	-0,88

Table 23 - Correlation matrix of Traveler satisfaction. The red colour indicates negative correlation between the data.

In other words the satisfaction might not be caused by the size of the population or population density, but all these indicators go together and it seems to be a pattern where the satisfaction among public transport users decrease as the system develops.

As an example to the cause of a pattern the results of a regression analysis follows below:

	<i>Coefficient</i>	<i>Standard error</i>	<i>T-test</i>	<i>P-value</i>
Constant	74,39	2,30	32,32	0,02
PT Market Share	-0,44	0,11	-4,06	0,15
Population	0,00	0,00	1,05	0,48
Population density	-0,22	0,08	-2,83	0,22

Table 24 - Table that indicates no significant relationship between travelers' satisfaction as dependent variable and public transport market share, population and population density as independent variables.

As the highlighted area in table 24 shows, there is no significant relationships²³ or reason to believe that the low satisfaction is caused by any of these characteristics. It only points out that the pattern exists and may be further investigated in order to find the true reason.

²³ For a value to be statistically significant at a 95% confidence level in a regression analysis the p-value needs to be smaller than 0.05.

9 Conclusion

9.1 Conclusions about the organizations in each region

One main conclusion is that the view of the public transport within the region matters and how each region choose to work with the public transport will make a difference. E.g. the regions where the involved counties together own the public transport companies have better economic conditions. The organizational work should include cooperation across county borders and a well prepared constrains for where, when and how a potential commercial actor may take place in the region.

- ⇒ All regions have some kind of cooperation between the counties
- ⇒ All regions have a joint tax-system
- ⇒ The west region spends the most money on public transport
- ⇒ The middle regions spend the least money on public transport
- ⇒ The eastern region has a big commercial operator
- ⇒ The public transport is the most expensive in the east region
- ⇒ The western region has the greatest market share of general public transport
- ⇒ The southern region has the most economically efficient region, but average general public transport share and greatest regional public transport market share

There are a lot of things that will help the development of public transport in each region that are listed and discussed in the next chapter. Below follow conclusions regarding each region separately.

9.1.1 The North Region

The northern region has a good relationship between the counties. The county councils have worked together before Norrtåg started, mainly with connections between buses. Because of large distances and a railway where people don't live it is difficult to get a good economic situation in the north region. Some counties like Jämtland chose not to participate in the doubling project because of the lack of money. The four northern counties that are included in the north regions own Norrtåg and they have a good insight into the business. On a national level they still struggle with the adjustments towards SJ commercial trains. Unfortunately the organizational form cannot affect the travel by public transport to any greater extent. The northern region needs to develop the rail network more in order to increase travel.

9.1.2 The Middle Region

The included counties own Tåg i Bergslagen and have good control of their need regarding railway traffic. They adjust the buses to the trains and representatives from each county form Tåg i Bergslagen. The middle region is highly dependent on the east region. There is no

organizational connection between these two regions and the middle region would benefit a lot from an increased cooperation.

9.1.3 The West Region

The western region consists of only one county after they reformed earlier four counties. Therefore, this region does not have the same challenges that the other regions in this report. The regional public transport authority owns Västtrafik to 100 % and they adjust to the needs of the county. People are unsatisfied in this region, whether it depends on the ticket system or other circumstances or the traffic it is hard to know.

9.1.4 The East region

Counties in this region refer to TiM AB as SJ AB and have therefore very low ability to influence the railway transport. This lack of insight leads a feeling of a non-coherent region. The economic situation has suffered from high cost towards SJ and no revenues. The counties in the east region are planning to manage the regional public transport on their own from the year 2017. If that is a good decision or even becomes reality remains to see.

9.1.5 The South Region

The southern region consists of counties which own Öresundståg AB and has a developed strategy for the cooperation between counties. Skånetrafiken AB owns 40 % of the company and has greater power than others in the region. There are some trends showing that the main focus in the region is towards Skåne County. Overall, this region is large with a wide spread cooperation and according to the statistics it is efficient in regional expansion. The south region has developed a package with constraints if a commercial operator wants to enter the market. This indicates that this region won't lose the holistic approach of public transport in the region.

10 Discussion

Commuting is not a goal itself and Bringert²⁴ highlights the importance to point out that all trips are not about work and school, but half is about duty travel, connections from mainline and leisure travel. The latter travels generate twice the money compared to commuting and school trips and there are those journeys that lead to the fact that commercial companies may gain a profit.

It can be noted that the statistics of the different counties give a good idea of indicators and the problems of a region, but the specifics of a region might as well be a product of geographical differences. Some parts of Sweden like for example Dalarna, which has the lowest market share in Sweden it is also one of the most car dense place in the country. There are people who are so used to their car that the price of a public transport ticket won't make the difference for them choosing a car or not. The biggest difference is how much the counties can influence the public transport and how well the economic works along with this.

Cherry-picking by the commercial operator

There are well-known problems with commercial operators' cherry-picking the lucrative train stretches and leaving the less beneficial lines to the county. The new public transport law from 2012 states clearly that every region public transport authority needs to look for a commercial company to operate a line within the region. If there is no commercial interest the PTAs can subsidize it to anyone feasible. The questions rose from this are:

What if a company wants to handle the public transport on the discussed lines, but only until 7 pm because there is no money to earn for the company after that, but the county council sees a need after that?

What if a company wants to handle the public transport on the discussed route, but without stopping at a certain station because the company loses too much time to the destination by doing this, but there is a need for providing public transport at this station for commuting?

A region with a big commercial operator may lead to less influence for the county and also problems with the commercial company picking the most fortune stretches and leaving the least fortune ones. This may furthermore lead to expensive public transport in the county. A region without a commercial operator may have a bigger influence on the traffic and also better economic conditions. What authorities need to watch out for is sub optimized traffic with larger costs than necessary. In general the tickets are more expensive in regions with commercial operators.

Figurative creation of large regions

²⁴ BRINGERT, K. (2014) Coordinator at Trafik i Mälardalen AB. *Interview with K, Bringert on 8th April 2014*

The greater a region is the better synchronized the traffic will be. It doesn't necessarily need to be one large region handling all public transport. Rather connect two or three adjacent regions in planning the traffic. Of course, there is a consideration between the levels of how complex the region becomes with a large amount of traffic compared to the benefits. Since the train system is so complex a changed timetable for a transport in Stockholm can have big consequences for a traveler in Ludvika. This is because one traveler can commute from Ludvika via Västerås to Stockholm, and the main focus for the transport between Västerås and Stockholm is to adjust in order to match the transport in Stockholm. After shifting the departure time for the transport in Stockholm, the transport from Västerås is adjusting and all of a sudden the commuter from Ludvika doesn't have any connecting train from Västerås. The point is that this problem can be avoided if the region collaborates with the adjacent region when planning the timetable. There is a need for insight in planning among competing firms.

Integrated ticket system

The need for a simple and understandable system cannot be over-estimated. A user of a public transport system wants to travel with one ticket from the same system regardless if there is a bus or a train. There are more to the system when it comes to cancellations and repurchase of tickets which also are an important part of an integrated system where these matters must be handled in the same way regardless of which county you are in.

As it is today there is no neutral service that can provide a transparent price for monthly passes regardless of corporate. Such a service as it is in England would simplify for the travelers. Further, it is not of any value for each region to try to solve this problem. That would still lead to sub optimized regions; this is a matter on a national level.

Integrated system in general

In the future, it will be important to have smooth changes. Travelers pay not only with money, but also with time. Public transport is attractive for the people who live in one city and work in another city. Not for those who live outside the city and work outside another. Then you understand that it becomes more attractive to travel incessantly in the car.

Within each region it is common that the buses are adjusting the timetable in order to fit the train departures. This might seem fully understandable since the time spot at which trains can departure is much more complex and difficult to adjust than a bus, but the problems lie within the regularity. Many counties interviewed in this project states the importance of a fixed timetable in order to reach a state where the traveler knows when the bus goes from their closest stop and it will always depart at that time. As it is today, this is almost impossible to make since the trains change departure time from year to year for different causes.

10.1 What regional public transportation organizations should consider

In order to make an attractive public transport that is well-used this part of the discussion will summarize the most important parts from the conclusions and the discussion in this work. If these four categories are fulfilled within large organizations towards a national united public transport the author thinks that the public market share will increase in the regions.

The counties should have their needs met

1. Assessment of priority routes which never can be compromised.
2. Planning for commercial operations in a county should be anchored to the public authority respectively.

The larger the region, the better

Short term priorities:

1. Must not be one big region and clearly stated interregional cooperation is good enough.

Long term priorities:

2. Adjacent regions should consider merging in order to work towards national public transport cooperation.
3. Fewer regional public authorities with larger areas to be responsible for and they should consider the needs for more than just one county.

The same ticket system

1. The traveler should not need to have multiple tickets along the way.
2. As Skånetrafiken have done, it should be specified a price tag in order to join the system.

Integrated system between trains and buses

1. It is important that there are connecting bus and train at the main transfer stations.
2. Fixed schedules as passengers learn the structure.
3. High speed trains on the mainline forces regional trains to switch time slot and point number 2 may be difficult to fulfil.

10.2 Future work

There is today a fact that the costs for public transport are increasing faster than new passengers joins the system. The pressure on public transport as a contribution to welfare,

regional growth, environmental savings, equity etc. are there, but the funding for completing this work are the same as before. It is a problem today with the government indicating the development of public transport without understanding the needed costs. On the other hand is it hard to say that the public transport should be expanded to increase the market share at any cost. The new infrastructure and vehicles required will be very expensive. For future work there will be interesting to investigate into what extent the public transport should be developed in a matter of cost and time.

11 References

11.1 Interview sources

AHLBERG, G. (2014) Former managing director of Öresundståg AB. *Interview with G. Ahlberg on 11th April 2014*. Telephone interview.

BRINGERT, K. (2014) Coordinator at Trafik i Mälardalen AB. *Interview with K, Bringert on 8th April 2014*. At SJ headquarter, Stockholm. [Recording in possession of author]

EFRAIMSSON, J. (2014) Head of public transport investigations at Västra Götalandsregionen. *Interview with J, Efraimsson on 4th April 2014* Gothenburg. [Recording in possession of author]

ERICSSON, R. (2014) Public transport strategist at the regional public transport authorities in Jämtland. *Interview with R, Ericsson 15th April 2014*. Telephone interview.

JONSSON, O. (2014) Head of strategic planning in Södermanland. *Interview with O, Jonsson 16th April 2014*. Telephone interview.

KYRK, J. (2014) Managing director of Trafik i Mälardalen AB. *Interview with J, Kyrk on 8th April 2014*. At SJ headquarter, Stockholm. [Recording in possession of author]

OLJEMARK, H. (2014) Managing director of Tåg i Bergslagen AB. *Interview with H, Oljemark 15th April 2014*. Telephone interview.

THÖRNBERG, H. (2014) Head of public transport authorities in Västerbotten. *Interview with H, Thörnberg 14th April 2014*. Telephone interview.

TIDERMAN, O. (2014) Managing director of Norrtåg AB. *Interview with O, Tiderman 16th April 2014*. Telephone interview.

ÅLIND, P. (2014) at the regional public authorities in Kalmar. *Interview with P, Ålind 13th February 2014*. Telephone interview.

11.2 Electronic sources

ATOC (2014). *About ATOC*. [Online] Available from: <http://www.atoc.org/about-atoc/> [Accessed: 13th May 2014]

BALCOMBE ET.AL., *The demand for public transport: a practical guide*, TRL report TRL593, 2004 [Online] Available from: <http://www.demandforpublictransport.co.uk/TRL593.pdf>

EMTA (2009) *Dutch E-ticketing System: success factors for the introduction of a nationwide system*. [Online] Available from: <http://www.emta.com/spip.php?article689&lang=en>

- FÖRDUBBLING (2011) *Allmän trafikplikt, En vägledning*. [Online] Available from: http://www.svensskollektivtrafik.se/Global/fordubbling.se/dokument/slutkorrt_trafikplikt8.pdf [Accessed: 10th February 2014]
- KOLLEKTIVTRAFIKMYNDIGHETEN VÄSTERBOTTEN (2012). *Framtidens kollektivtrafik i Västernorrland*. [Online] Available from: <http://www.trafikforsorjningsprogrammet.se/>
- LANDSTINGET GÄVLEBORG (2012). *Regional Trafikförsörjningsprogram för Gävleborg*. [Online] Available from: <http://x-trafik.se/files/4/18/40/trafikforsorjningsprogram.pdf> [Accessed: 23th April 2014].
- LANDSTINGET I KALMAR (2013) *Detta är landstinget i Kalmar län* [Online] Available from: http://www.ltkalmar.se/Documents/Om%20landstinget/LTKalmar_PPT_2013.pdf [Accessed: February 5th, 2014]
- LANDSTINGET I ÖSTERGÖTLAND, 2012. "REGIONALT TRAFIKFÖRSÖRJNINGSPROGRAM FÖR ÖSTERGÖTLAND 2012- 2020". <http://www.lio.se/PageFiles/2353/RTP%202012-2020%20Slutlig%20version%2020120920.pdf>
- LÄNSSTYRELSEN (2012). *Körsträckor*. [Online] Available from: <http://projektwebbar.lansstyrelsen.se/rus/Sv/statistik-och-data/korstrackor-och-bransleforbrukning/Pages/default.aspx> [Accessed: 19th February, 2014]
- LÄNSTRAFIKEN KALMAR (2012) *Trafikförsörjningsprogram för Kalmar län 2013-2021*. [Online] Available from: http://www.klt.se/PageFiles/4622/LTKalmar_Trafik%C3%B6rs%C3%B6rjningsprogram_2013-2021_rev%2013_09_25.pdf [Accessed: 5th May 2014]
- NORRBOTNIABANAN (2014). *North Bothnia Line - a part of The Bothnian Corridor* [Online] Available from: <http://www.norrbotniabanan.se/en/> [Accessed: 24th April 2014].
- NORRBOTTENS LÄNS LANDSTING (2012). *Regionalt trafikförsörjningsprogram för Norrbottens län*. [Online] Available from: <http://www.nll.se/upload/lg/regio/Infrastruktur/Regionalt%20trafik%C3%B6rs%C3%B6rjningsprogram%20f%C3%B6r%20Norrbottens%20l%C3%A4n%202012-10-01.pdf>
- NORRTÅG (2014). www.norrtag.se
- REGERINGEN (2010) *Regeringens proposition 2009/10:200 Ny kollektivtrafiklag*. Available from: <http://www.regeringen.se/content/1/c6/14/34/53/9617bce0.pdf> [Accessed: February 5th, 2014]
- REGERINGEN (2014). *Regeringen påskyndar arbete för bättre kollektivtrafik* [Online] Available from: <http://www.regeringen.se/sb/d/4902/a/239786>

- REGERINGSKANSLIET (2014). *De transportpolitiska målen*. Available from: <http://www.regeringen.se/sb/d/18128>
- REGION BLEKINGE (2012) *Regionalt trafikförsörjningsprogram för Blekinge (2012-2015)*. http://www.regionblekinge.se/media/291278/trafikprog_131216_screen.pdf [Accessed 10 February, 2014]
- REGION HALLAND (2012). *Regionalt trafikförsörjningsprogram (2013-2015). Halland*. <http://www.regionhalland.se/PageFiles/45919/TFP%20Halland%202013%20kompletterat.pdf> [Accessed 10 February, 2014]
- REGION SKÅNE (2012). *Trafikförsörjningsprogram för Skåne 2012*. <http://www.skane.se/Public/RU/Trafikf%C3%B6rs%C3%B6rjningsprogram/Trafikf%C3%B6rs%C3%B6rjningsprogram%20Sk%C3%A5ne%202012.pdf> (2014-02-05)
- REGION SKÅNE (2012). *Trafikförsörjningsprogram för Skåne, 2012*. [Online] Available from: <https://www.skanetrafiken.se/upload/Dokument/Styrdokument/Trafikf%C3%B6rs%C3%B6rjningsprogram/Trafikf%C3%B6rs%C3%B6rjningsprogram%20Sk%C3%A5ne%202012.pdf> [Accessed: January 23th, 2014].
- REGION VÄSTERBOTTEN (2013). *Regionalt trafikförsörjningsprogram för Västerbotten 2012-2015*. http://regionvasterbotten.se/wp-content/uploads/2012/08/Trafikf%C3%B6rs%C3%B6rjningsprogramV%C3%A4sterbotten_2012_2015_rev.pdf
- REGIONFAKTA (2014). Available from: <http://www.regionfakta.com/>
- REGIONFÖRBUNDET JÄMTLANDS LÄN (2012). *Trafikförsörjningsprogram*. [Online] Available from: <http://www.regionjamtland.se/verksamhet/regional-kollektivtrafikmyndighet>
- RIKSDAGEN (2010). *Lag (2010:1065) om kollektivtrafik*. Available from: http://www.riksdagen.se/sv/Dokument-Lagar/Lagar/Svenskforfattningssamling/Lag-20101065-om-kollektivtr_sfs-2010-1065/ [Accessed 5th February, 2014]
- SAMTRAFIKEN (2013). *Resevillkor för resplusresa*. Available from: <http://www.samtrafiken.se/wp-content/uploads/2013/11/Resevillkor-for-Resplusresa-fran-20140101.pdf>
- SAMTRAFIKEN (2014). *Vårt uppdrag*. Available from: <http://www.samtrafiken.se/om-samtrafiken/vart-uppdrag/>
- SCB, 2013. Statistiska centralbyrån – Befolkningsstatistik. http://www.scb.se/sv/_/Hitta-statistik/Statistik-efter-amne/Befolkning/Befolkningens-sammansattning/Befolkningsstatistik/25788/25795/

- SKÅNETRAFIKEN (2013). *Kommersiell kollektivtrafik i Skåne* [Online] Available from: http://www.skane.se/Upload/Webbplatser/RU/kollektivtrafik/Erbjudande_Kommersiell_Kollektivtrafik_Sk%C3%A5netrafiken_%202013.pdf [Accessed: april 24th 2014]
- SKL (2014). *Öppna jämförelser - Kollektivtrafik 2014* [Online] Available from: <http://webbutik.skl.se/bilder/artiklar/pdf/7585-054-2.pdf?issuusl=ignore> [Accessed: april 24th 2014]
- LADSTINGET SÖRMLAND (2012). *Sörmlands regionala trafikförsörjningsprogram* http://www.landstingetsormland.se/PageFiles/31323/TFP_sormland_2012_10_26.pdf
- SVENSK KOLLEKTIVTRAFIK (2012). *Statistikportalen*. [Online] Available from: <http://www.svenskkollektivtrafik.se/Statistikportal/Oversikt/> [Accessed: 23th January 2014]
- SVENSK KOLLEKTIVTRAFIK (2013). *Årsrapport 2013 KOLLEKTIVTRAFIKBAROMETERN*. [Online] Available from: http://www.svenskkollektivtrafik.se/Documents/KOLBAR%20Ipsos_Rapport_Hel%C3%A5r%202013final.pdf [Accessed: 5th May 2014]
- SVENSK KOLLEKTIVTRAFIK (2014). *9 argument för kollektivtrafikens samhällsnytta* [Online] Available from: <http://www.svenskkollektivtrafik.se/Global/Fakta%20och%20publikationer/publikationer/9%20argument.pdf>
- TÅGKOMPANIET (2014). <http://www.tagkompaniet.se/> [Accessed: Mars 21th, 2014]
- TRAFIKANALYS (2012). *Lokal och regional kollektivtrafik* Available from: http://trafa.se/PageDocuments/Lokal_och_regional_kollektivtrafik_2012.pdf [Accessed: May 20th, 2014]
- TRAFIKANALYS (2012). *Öresundstågstrafikförsöket – en utvärdering av trafikhuvudmännens agerande och erfarenheter*. [Online] Available from: http://trafa.se/PageDocuments/Trivector_OEresundstaagstrafiksfoersoeket_-_en_utvaerdering_av_trafikhuvudmaennens_agerande_och_erfarenheter.pdf [Accessed: January 21th, 2014]
- TRAFIKANALYS (2013a). *Utvärdering av marknadsöppningar i kollektivtrafiken*. [Online] Available from: http://trafa.se/PageDocuments/Rapport_2013_13_Utvaerderingar_av_marknadsoeppningar_i_kollektivtrafiken_-_rapport_2013.pdf [Accessed: January 22nd, 2014]
- TRAFIKANALYS (2013b). *Regionala kollektivtrafikmyndigheter - ORGANISATION OCH VILLKOR FÖR ETABLERING AV KOMMERSIELL KOLLEKTIVTRAFIK*. [Online] Available from:

http://www.trafa.se/PageDocuments/Sweco_Organisation%20och%20villkor%20f%C3%B6r%20etablering%20av%20kommersiell%20trafik.pdf

TRAFIKANALYS (2013c). *Indikatorer för en transportpolitisk måluppföljning*. [Online]

Available from:

http://trafa.se/PageDocuments/Rapport_2013_2_Indikatorer_foer_en_transportpolitisk_maluppfoljning.pdf

TRAFIKVERKET (2014). *Sveriges Järnvägsnät*. [Online] Available from:

<http://www.trafikverket.se/Privat/Vagar-och-jarnvagar/Sveriges-jarnvagsnat/> [Accessed: May 6, 2014]

TRANSTIO (2014) *About Transitio* [Online] Available from: <http://www.transitio.se/in-english/> [Accessed: April 22th, 2014]

VÄSTRA GÖTALANDSREGIONEN (2012). "Regionalt trafikförsörjningsprogram för Västra Götaland".

http://www.vgregion.se/upload/Regionkanslierna/Kollektivtrafikn%C3%A4mnden/TPR/Trafikf%C3%B6rs%C3%B6rjnprogr_VGR_130625_l%C3%A5guppl%C3%B6st.pdf

VÄSTRA GÖTALANDSREGIONEN (2014a). "Västtrafik – En del av Västra Götalandsregionen".

<http://www.vgregion.se/sv/Vastra-Gotalandsregionen/startside/Kollektivtrafik/Vasttrafik/>

VÄSTRA GÖTALANDSREGIONEN (2014b) "Bakgrund och historik"

<http://www.vgregion.se/sv/Vastra-Gotalandsregionen/startside/Politik/Vagen-till-Vastra-Gotalandsregionen/Bakgrunden/> [Accessed: May 20th, 2014]

ÖREBRO LÄNS LANDSTING (2012). *Regionalt trafikförsörjningsprogram för Örebro län*

http://www.orebroll.se/Files-sv/%C3%96rebro%20l%C3%A4ns%20landsting/Regional%20utveckling/Trafik/Trafikstrategi_l%C3%A5guppl%C3%B6st.pdf?epslanguage=sv

11.3 Publications

Cantwell, M., Caulfield, B., O'Mahony, M., (2009), Examining the factors that impact public transport commuting satisfaction, *Journal of Public Transportation*, Vol 12, No. 2, 2009.

Forslund, M., (2013) "Organisering och ledning".

Fröidh, O. (2014) TRANSPORTFORUM LINKÖPING. *Utvecklingen av den regionala tågtrafiken och storregionala tågsystem*.

Hergesell, A. & Dickinger, A. (2013) *Environmentally friendly holiday transport mode choices among students: the role of price, time and convenience*, *Journal of Sustainable Tourism*, 21:4, 596-613, DOI: 10.1080/09669582.2013.785555

Jonsson, D. (2011) *Fare Management System in Public Transport – an analysis of actors and roles*.

Trivector, 2012. *"Kollektivtrafikens urverk – att dra nytta av de schweiziska framgångsfaktorerna i en avreglerad marknad"*.